DOCUMENTOS DE POLÍTICA ECONÓMICA

BANCO CENTRAL DE CHILE



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José De Gregorio N.° 15 – Septiembre 2005

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CENTRAL BANK OF CHILE

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Documentos de Política Económica del Banco Central de Chile Economic Policy Papers of the Central Bank of Chile ISSN 0717 – 7151 Huérfanos 1175, primer piso. Teléfono: (56-2) 6702475; Fax: (56-2) 6702231

Global Imbalances and Exchange Rate Adjustment

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September 2005

In these notes I will first discuss some salient features of the current US external imbalance, with a focus on its impact on emerging markets. Then, in section 2, I will discuss the relationship between exchange rate fluctuation and external adjustment, focusing on the quantitative importance of trade and valuation effects. Finally I will present some concluding remarks.

1 The US Current Account Deficit

Today's US external imbalance is large and unsustainable, since the US cannot borrow permanently at current levels. The US is the only major industrial country that has run a deficit above 5% of GDP since 1971 (Edwards, 2005) and, given its weight in the world economy the demand for foreign financing is unprecedented.[1] The origins of the imbalance, the timing of the adjustment, the policy implications, and the consequences are all sources of debate. At the core of the discussion is the required adjustment in the exchange rates for global rebalancing.

The benign view, although recognizing that such a situation cannot persist forever, would argue that the adjustment will occur with minor changes in exchange

*Comments to "From World Banker to World Venture Capitalist: The US External Adjustment and the Exorbitant Privilege" by Pierre-Olivier Gourinchas and Hélène Rey. Presented at the NBER Conference on G7 Current Account Imbalances: Sustainability and Adjustment, Newport, RI, June 2005. I am grateful to César Calderón, Gian Maria Milesi-Ferretti, Jorge Selaive and Cedric Tille for useful discussions, but I remain the only responsible for the views expressed herein.

[1]Backus and Lambert (2005), looking at historical data dispute the view that there are no precedents of this type of imbalances. However, they find large deficits during the Bretton Woods period, where under fixed exchange rates persistent imbalances were much more likely, due to persistent misalignments. Dooley et al. (2004) argue that we are now getting closer to a new Bretton Woods system, because of the heavy reserve accumulation of Asian countries, especially China, to avoid an appreciation.

rates and no disruptions in the world economy. A more pessimistic view would argue that a sharp exchange rate correction is necessary for reallocating resources to the tradable goods sector and for reducing domestic expenditure. This adjustment will not necessarily result in global turmoil, but of course it entails more risks than the benign view. Postponing action and adding to it a fiscal imbalance does not help to smooth the correction.

A number of authors have recently highlighted an additional channel through which exchange rates contribute to the external adjustment, namely *valuation effects*, also called the *financial adjustment channel*.[2] Given that the foreign international investment position comprises many currencies, a depreciation will have valuation effects, resulting in wealth transfers across countries. This new paper by Gourinchas and Rey (2005b) (GR henceforth) provides a detailed account of the foreign investment position of the US, reporting yields across different types of assets and liabilities, identifying the impact of a depreciation of the dollar on different yields, and discussing the channels through which the exchange rate facilitates the adjustment, among many other interesting discussions and insights.

The discussion on global imbalances has also been complemented by recent research attempting to identify the main features of current account reversals, initiated by the influential work of Milesi-Ferretti and Razin (2000). Looking at US history, perhaps the closest case of current account reversal took place in the mid eighties. Despite some differences, the accumulated empirical evidence and an examination of the US adjustment of the mid eighties show three relevant features:

- Current account reversals come with a slowdown of economic growth (Freund and Warnock, 2005). According to these authors a one percentage point adjustment in the current account would result in a decline in GDP growth with respect to trend of about 0.15 percentage point over the first three years (figure 1).
- Current account reversals are generally accompanied by sharp depreciations of the currencies, causing in some cases a currency crisis (Edwards, 2005).[3] Moreover, Freund and Warnock (2005) have found that the exchange rate adjustment is larger when the current account deficit is driven by consumption not investment-financing. This is consistent with traditional models that predict that in the absence of investment in the tradable sector, a larger depreciation is needed to reallocate resources to restore external balance (figure 2).
- The reversal of the current account deficit in the mid eighties came with a surge of US capital flows to emerging markets. Indeed, the surge of capital flows

[2]Lane and Milesi-Ferretti (2001), IMF (2005), Tille (2003) and Gourinchas and Rey (2005a).

[3]Here I use the broad index of the real exchange rate reported by the Federal Reserve. An increase in this index represents a real appreciation.

to emerging economies documented by Calvo et al. (1993) occurred when the demand of the US for foreign financing declined (figure 3). They suggest that this phenomenon was caused by push-factors, to a large extent independent of developments in the emerging economies themselves. Figure 3 shows that in recent years capital flows to emerging markets have been increasing, but mostly to Asia, particularly China, which is receiving the bulk of capital flows. In the case of China, these inflows have not financed a current account deficit, but have been used primarily for reserve accumulation to ward off an appreciation of the renminbi. In contrast, emerging markets with floating exchange rates, in particular in Latin America, have seen very small net inflows as they have been running current account surpluses. Therefore, the availability of foreign financing for emerging markets should rise as the US current account deficit narrows.

Sooner or later there must be a reversal. The issue is whether this reversal will be costly and what repercussions will it have on the global economy. I want to comment particularly on its impact on emerging market economies.

It is very likely that during the adjustment we will see a slowdown of growth in the US, a depreciation of the dollar and a surge of capital flows to emerging markets. US growth consensus forecast is already taking into account slower growth, which is falling from 4.4% in 2004 to 3.2% in 2006. However, the magnitude of the reduction should not cause major disruptions in the world economy, as the US will be growing close to its long-term potential.

A depreciation of the dollar brings up the uncertainty about which currencies will take the burden. The euro seems more unlikely, and costly, given weak economic performance in Europe. However, the adjustment may be retarded while Asian countries defend their currencies from a weakening dollar, building pressure on the rest of the currencies.

The question of whether these developments are good or bad news for emerging economies has a mixed answer. The impact of a slowdown of growth may be more than offset by the positive effect on capital flows. Regarding the depreciation of the dollar, the evidence shows that commodity prices increase when the dollar depreciates (Dornbusch, 1985). Indeed, the significant gain in terms of trade experienced by commodity exporting countries has coincided with the depreciation of the dollar that has taken place since mid 2002 (see figure 4).

Perhaps where we know least is interest rate adjustment. This evidence is more uncertain, in particular because of the low levels of long rates despite the large fiscal deficit of the US. Naturally, a sharp increase in interest rates could result in financial turmoil in developing countries, the more so the larger their debts.

Of course we can predict catastrophic scenarios, but they are improbable, since the world economy is better prepared for significant adjustment to global imbal-

ances. From the standpoint of emerging economies, some positive developments, such as those mentioned above, may facilitate the adjustment. In addition, emerging economies are today in a better position than they were in the last 25 years to face difficulties in the external front. Inflation is under control. The external sector exhibits current account surpluses in most countries; for example, in Latin America this could be about 75 billions of US dollars during 2005. Fiscal deficit in Latin America is slightly over 1% of GDP, showing unprecedented fiscal prudence, and hence the demand for foreign financing is limited. This is also reflected in improved sovereign ratings for these countries.

The evidence reported by GR helps to better understand the channels through which an exchange rate correction in the US contributes to external adjustment, and I will refer to this in more detail in the next section.

2 Valuation versus Trade Effects

Consider the following equation for the dynamics of net foreign asset (NFA) accumulation:

$$NX_t + (1 + r_t^a)A_t - (1 + r_t^l)L_t = NFA_{t+1}, \tag{1}$$

where NX stands for net exports, A is foreign assets with a return equal to r^a, L is foreign liabilities with a return r^l, and NFA is net foreign assets $(A-L)$. Expressing the previous equation as share of GDP we have that:

$$(1 + r_t^l)nfa_t = -[nx_t + (r_t^a - r_t^l)a_t] + (1 + \gamma_{t+1})nfa_{t+1}. \tag{2}$$

Net exports are a function of the exchange rate, where e denotes its log, and a set of other variables that for the purposes of this discussion will be omitted. As argued by many authors and carefully documented by GR, most of US foreign liabilities are denominated in dollars, while part of assets are denominated in foreign currency, which generates the valuation effect. However, the valuation effect must be in real terms, because returns in dollars could compensate for changes in the price of the currencies. Indeed, what really matters for the valuation effects are unexpected changes in the exchange rate. For this reason, the return on foreign assets will depend on the rate of depreciation, which proxies for unexpected changes in the exchange rate.

When the dollar depreciates, there is a once-and-for-all gain in valuation. Therefore, I assume that r^a depends on the rate of depreciation, Δe. On the other hand, just for simplicity, I will assume that r^l is constant and equal to r and the rate of growth is also constant and equal to γ. Integrating forward equation (2), considering the appropriate no-Ponzi game condition, we have the following intertemporal

budget constraint:[4]

$$(1+r)na_t = -\sum_{s=0}^{\infty} \frac{nx(e_{t+s}) + (r^a(\Delta e_{t+s}) - r)a_{t+s}}{(1+r-\gamma)^s}. \tag{3}$$

This expression describes many exchange rates' "equilibrium paths," since more structure is needed to pin down a unique path.[5] But this equation shows that postponing an adjustment will require a more depreciated exchange rate in the future. The reason is that an appreciated exchange rate will result in a deterioration of the net foreign assets position, which implies that in the future more net exports will be needed.

From the perspective of GR's paper, the most important point of equation (3) is that a depreciation has a permanent effect on net exports and a one-time valuation effect. Indeed, the estimations of GR show that a 10% depreciation of the dollar generates between 2 and 3 percentage points decline in the return on foreign assets, for an average return of about 7%. On the side of liabilities, a 10% depreciation of the dollar produces an increase in the return on foreign liabilities between 1 and 1.5 percentage points, for an average return of about 4%. Their estimations stress some important features regarding the current US foreign investment position:

1. The US enjoys an "exorbitant privilege" because $r^a > r^l$, and this difference is about 3 percentage points. Therefore, the US can run a permanent deficit in net exports, despite having a negative international investment position.

2. From (1) we see that the exorbitant privilege is given by $r^a A - r^l L$, which can even become negative if external liabilities surpass assets by a large enough margin. Indeed, GR show that we are close to that point since at current rates differential L/A must be less than 1.6, and it is currently at 1.34, close and approaching 1.6 while the deficit continues.

3. Another important aspect that can be seen in the budget constraint is that a depreciation of the US dollar facilitates external adjustment not only via an increase in net exports, but also via valuation effects. The valuation effect is due to the fact that r^a depends on the depreciation. The difference between the "exorbitant privilege" and the valuation effect is that the former depends on a persistent difference between the return on assets and the return on liabilities, while the valuation effect depends on unexpected changes in valuation due to changes in the exchange rate.

[4] Strictly speaking, a, the return on liabilities, also depends on the exchange rate. This will be considered when doing a numerical application below.

[5] For example, asset markets equilibrium in a world of imperfect asset substitutability is a natural candidate, as done in Kuori (1983) or Blanchard et al. (2005).

The effect of exchange rates on the return on foreign assets and liabilities for a number of industrial countries has been examined by Lane and Milessi-Ferretti (2005). They find that the effects of a real depreciation on foreign assets' returns for the US is the smallest, since the US has probably the largest share of assets denominated in dollars. But, on the side of liabilities, the US is the only country where a real depreciation does not significantly affect returns, consistently with the fact that most US liabilities are denominated in dollars. For the rest of industrial countries, a real depreciation increases the return on liabilities. In net terms, the US is the country that benefits the most from a real depreciation.

In the recent experience with the widening of the US current account deficit, many observers have argued that globalization facilitates the external adjustment. The budget constraint (3) also serves to illustrate this point. Increased globalization implies that, for a given net asset position (na), gross assets (a) are larger. In the presence of the exorbitant privilege, globalization helps the external adjustment. In the transition to a larger participation of US assets in global portfolio, the US may have massive financing available.

However, this effect has its limits. Increased demand for safe assets and global portfolio adjustment may lead to an increase in US liabilities and assets. However, the increase in a is not unlimited, and it is difficult to justify that an increase in the international investment position of the US can be sustained without a reduction in the exorbitant privilege. As Roubini and Setser (2004, p.6) put it: "the US should not count on being able to fool all of the people all of the time: expected persistent real depreciation of the US dollar would lead foreigners to require ex-ante higher returns on their US dollar asset holdings to minimize their capital losses."

This approach can be used to estimate the effects of a real depreciation on external adjustment, adding up the valuation and trade effects. GR estimate the required depreciation to bring the economy to the steady state in one, three and five years. In one year, a 75% depreciation would be required, and as the period lengthens, the depreciation must increase because during the transition to the steady state the economy is increasing its negative foreign asset position. While interesting, this exercise may be unrealistic, since the economy will adjust over the long run to the steady state, and this should be enough to keep solvency as indicated by the intertemporal budget constraint.

We can compute constant levels for net exports and the interest rate differential that keep net foreign assets at a constant value equal to $\overline{nfa}$. We can also compute the required exchange rate depreciation to achieve this. The valuation effect operates only in the period in which the depreciation takes place, from then on the "exorbitant privilege" persists, but with no gains from the exchange rate, which is assumed to be constant. Solving (3) for constant nx and a, a once-and-for-all valuation gain at

time t, and the remaining exorbitant privilege, we have that (ignoring growth):

$$r \times \overline{nfa} = nx(\bar{e}) + \frac{r}{1+r}(r^a(\bar{e} - e_0) - r)a + \frac{1}{1+r}(r^a - r)a \tag{4}$$

where $\bar{e} - e_0$ is the depreciation needed to achieve a constant level of net foreign assets. The first term is net exports, the second is the valuation gain at t for a depreciation from e_0 to e, and the third one is the flow of the exorbitant privilege.

We can use this expression to compute the effects of a depreciation on external adjustment. This is just an expansion of the traditional elasticity approach to consider valuation effects. However, we need to take into account that the valuation effect is a once-and-for-all effect, and for this reason it appears in (4) as the annuity of the change in returns in the period in which the depreciation takes place. The last term of (4) is not affected by the exchange rate, which I assume to remain constant after the depreciation happens.

Differentiating (4) with respect to e we have that a change in de will induce an external adjustment of Λ given by:

$$\Lambda = \frac{\partial nx}{\partial e}de + \frac{ra}{1+r}\frac{\partial r^a}{\partial \Delta e}de. \tag{5}$$

Using GR parameters, we have that $\partial nx/\partial e = 1/15 = 0.067$. On the other hand, using an interest rate of 4% and a ratio of foreign assets to GDP of 76%, we can calculate the valuation effect, by using $\partial r^a/\partial \Delta e$ estimated by GR. However, we must also take into account that the return on liabilities is affected by a depreciation as well. The semi-elasticity of returns on assets in one year estimated by GR is 0.28, for assets being 76% of GDP, while the semi-elasticity for the return on liabilities is -0.08, for liabilities being 103% of GDP. Therefore, a rough estimate for the gain in returns on net assets deriving from a 1% depreciation, expressed with respect to assets, is $0.28 + 0.08 \times (103/76) = 0.39$. Therefore, we have that the valuation effect is $0.04 \times 0.76 \times 0.39/1.04 = 0.011$. Then, a 10% depreciation would result in a total effect of 0.78%. The valuation effect accounts for only 14% of the total effect.[6]

An adjustment of 3% of GDP would require a 38% depreciation (3/0.078). If there were no valuation effect, the required depreciation would be 45%. Figures are similar to those of Blanchard et al. (2005), Edwards (2005), and Obstfeld and Rogoff (2005).

The lesson from these simple calculations is that the valuation effect has a small impact on external adjustment. The reason is simply that it is a one-time effect. A back-of-the-envelope calculation may clarify the point. As argued in the GR's introduction, a 10% depreciation represents a 5% of GDP transfer from the rest of

[6] According to Obstfeld and Rogoff (2005), the valuation effect would represent 20% of the total effect of a depreciation.

the world to the US. As an annuity this would be 0.2% of GDP, a figure somewhat larger than the 0.11% one obtains from the semi-elasticities of returns computed by GR. The reason is that, as argued by GR, the covariates of the returns reduce the effects of the depreciation. For example, a depreciation reduces the returns on assets, but this depreciation could result in an increase in the value of the stocks in dollars, for example in the tradable sector, which would partly offset the direct gain–losses for foreign investors–from valuation.

In summary, although the valuation effects are conceptually important, and may play an important role in the short run, over the long run trade effects remain playing the lead part.

A caveat to this calculations is that these effects do not necessarily imply that welfare effects from valuation are necessary. Indeed, Tille (2004) has modeled the welfare effects from valuation and found that they are not small. The reason is that a depreciation affords greater consumption due to high net exports and gains in valuation. But, in order for the trade channel to operate, an increase in net exports requires more work. In contrast, the valuation effect entails a wealth transfer that does not need extra work, and hence has no costs from the welfare viewpoint.

3 Concluding Remarks

In these comments I have argued that the valuation effect, although significant in the short run, is much less important from a longer-term view. Indeed, the exchange rate adjustment operates mainly through the traditional trade effect.

In the short run, and particularly from the point of view of emerging economies, the valuation effect could be more important. Short-term movements in capital flows could be partially offset by changes in valuation. This is related to the notion that one key problem of emerging economies is that they cannot borrow in their own currencies. Therefore, when the domestic currency depreciates, the return on liabilities increases in terms of local goods. The burden of liabilities rises. For industrialized countries, the valuation effect operates in the other direction, helping the external adjustment.

A typical case in point as a good example is Australia, where, according to the estimations of Lane and Milesi-Ferretti (2005), a 10% depreciation reduces the return on net foreign liabilities by about 2%, somewhat less than the 5% for the US.

Whether or not the inability of many economies to borrow internationally in their own currencies is "the original sin" (Eichengreen and Hausman, 1999), this discussion highlights the importance of international risk sharing. And precisely in moments where international financial markets stop lending to emerging markets, the ensuing depreciation will ameliorate the negative impact on countries that have

been able to borrow in their own currencies.

From the point of view of current global imbalances, a current account reversal should occur sooner or later; a depreciation of the dollar should help, but the contribution of valuation effects will still be limited.

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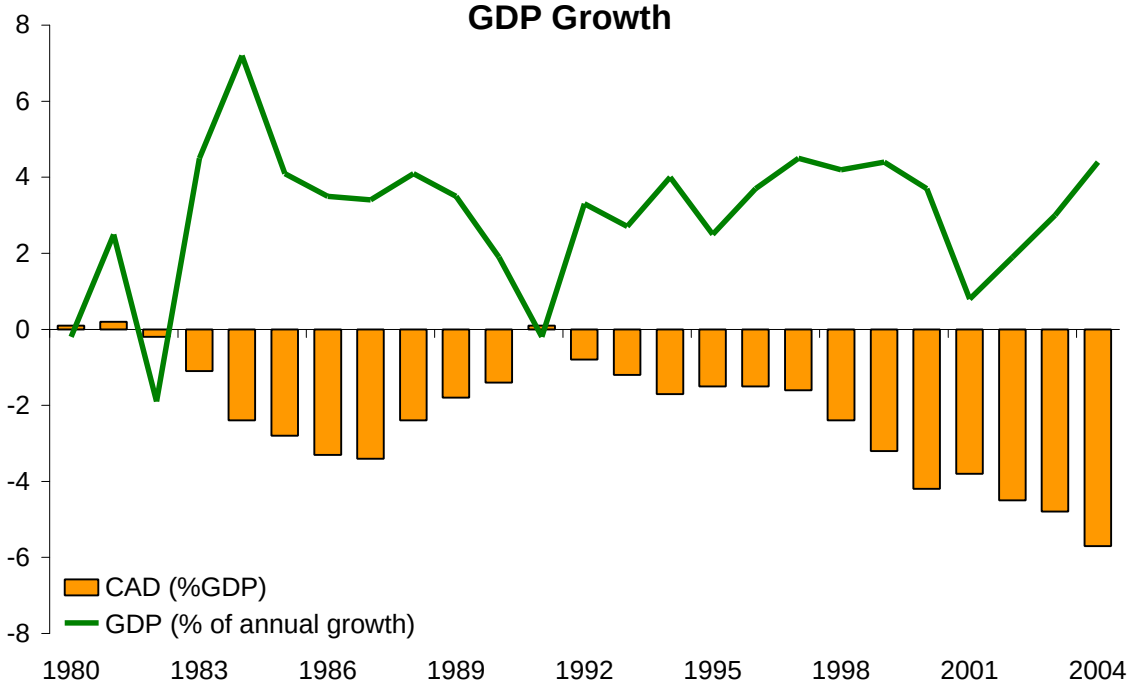
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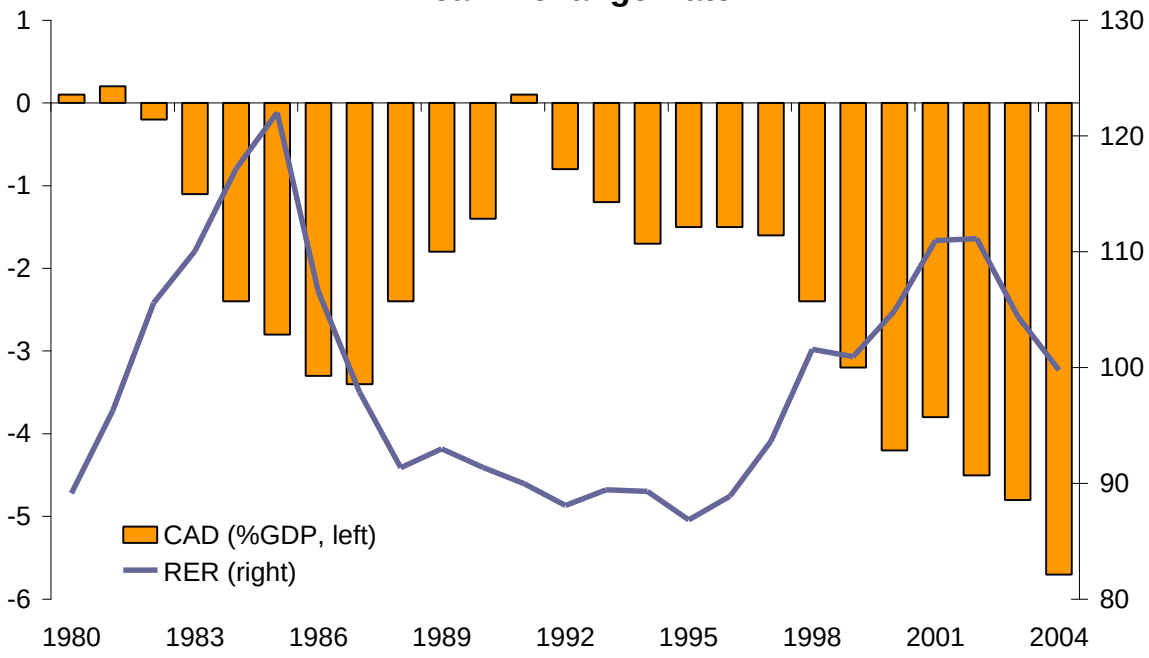
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Figure 1: United States: Current Account Deficit and GDP Growth



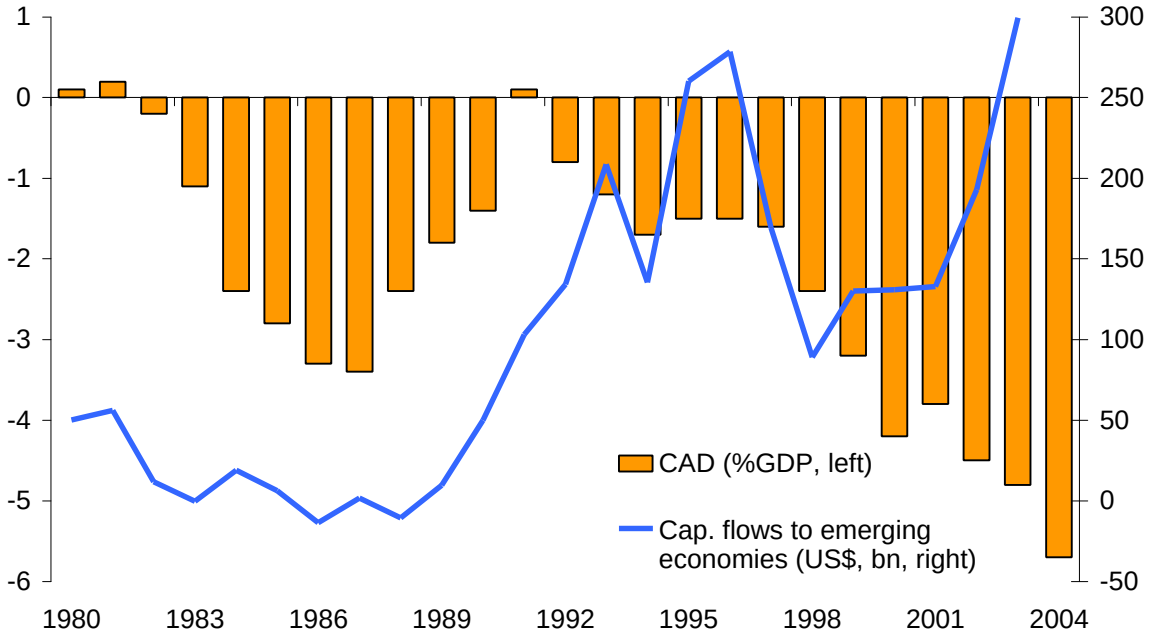
Source: WEO.

Figure 2: United States: Current Account Deficit and the Real Exchange Rate



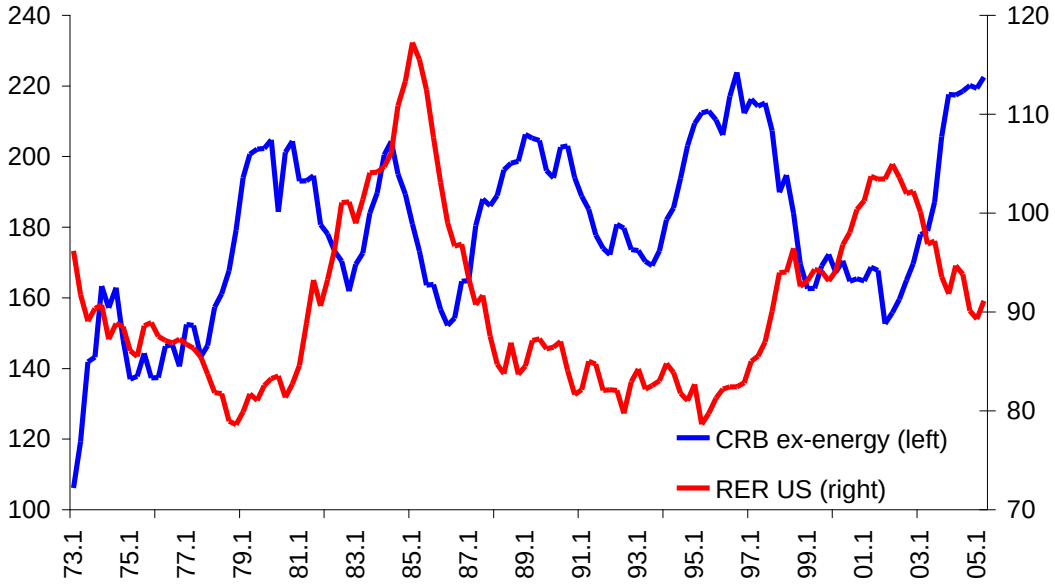
Sources: WEO and Federal Reserve.

Figure 3: US Current Account Deficit and Capital Flows to Emerging Economies



Sources: IFS and WEO.

Figure 4: Real Exchange Rate and Commodity Prices
(January 1973=100)



Sources: Commodity Research Bureau and US Federal Reserve.