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Projecting the US Current Account Deficit and Net Foreign Assets

The degree of urgency for the United States to achieve external adjustment depends in part on the expected baseline for the current account deficit and net international liabilities in the absence of adjustment. The more explosive this baseline, the more critical it is that adjustment be early and decisive. This chapter presents results of a projection model developed to examine this question. The model builds on the traditional workhorse ''elasticities'' model, in which the growth of imports and exports depends on the real exchange rate, domestic and foreign growth, and the income and price elasticities for trade. The model incorporates the influence of capacity growth, however, and thereby importantly reduces the ''Houthakker-Magee asymmetry'' in which the income elasticity is much higher for imports than for exports (Houthakker and Magee 1969). The current account model projects changes in the levels of three categories of external assets and liabilities: direct investment, portfolio equity, and debt instruments (bonds, bank claims, and nonbank loans). A key feature of the model is its attention to the differential rates of return on direct investment assets abroad and direct investment liabilities to foreigners. Another important feature is the direct incorporation of valuation changes in direct and portfolio equity positions resulting from price increases and exchange rate changes.

A Simple Projection Model

Let X and M be, respectively, nominal exports and imports of goods and (nonfactor) services. Let P be price, with subscripts x and m for exports and imports respectively. Let the asterisk denote real quantities; R^* be the real exchange rate, measured in real dollars per real foreign currency (deflating by the consumer price index); L refer to the lagged value of the real exchange rate; the overdot refer to proportionate change from the previous year; g refer to real annual growth (in proportionate terms), with subscripts d for domestic and f for foreign; gc refer to trend annual output capacity growth; and $\hat{g}_d$ be average US growth and $\hat{g}_f$ average foreign growth over 1992–2003. The basic projection equations for trade in goods and services can then be written as:

$$X^*_t = X^*_{t-1}(1 + \beta\phi\dot{R}^*_L)(1 + \eta g_f)(1 + \varepsilon gc_d)(1 + \Omega\{g_f - \hat{g}_f\}) \tag{3.1}$$

where β is the absolute value of the price elasticity of foreign demand for US exports, ϕ is the exchange rate pass-through ratio for exports, η is the income elasticity of foreign demand for US exports, ε is the elasticity of US exports with respect to trend growth in domestic production capacity, and Ω is the cyclical elasticity of export demand.[1] Gagnon (2003) suggests this incorporation of capacity growth, along with parallel inclusion of foreign capacity growth on the import side:

$$M^*_t = M^*_{t-1}(1 + \alpha\theta\dot{R}^*_L)(1 + \gamma g_d)(1 + \delta gc_f)(1 + \lambda\{g_d - \hat{g}_d\}) \tag{3.2}$$

where α is the price elasticity of demand for US imports, θ is the exchange rate pass-through ratio for imports, γ is the income elasticity of demand for US imports, δ is the elasticity of US imports with respect to trend growth in foreign output capacity, and λ is the cyclical elasticity of imports.[2]

Gagnon (2003) has developed empirical estimates for this structure (except without the cyclical terms) for the United States, placing the price elasticities at unity on both exports and imports, the income elasticities at 1.5 on both the export and import sides, and the output capacity elasticities at 0.75 on both sides. This structure is appealing to those who consider that rapidly outward-shifting supply in developing countries in particular is a more reasonable explanation than Houthakker-Magee asymmetry for a greater difference between US import and export growth than would be expected from comparison of US and foreign income growth (Krugman 1989, Cline 1995a). In the capacity-enhanced equations,

1. The export pass-through ratio is $\phi = 1$ if exporters do not increase their dollar price in foreign markets when the dollar depreciates or appreciates, and $\phi = 0$ if they fully increase (decrease) their dollar price to offset dollar depreciation (appreciation).

2. The import pass-through ratio is $\theta = 1$ if foreign suppliers fully increase (decrease) the dollar price they charge in the US market when the dollar depreciates (appreciates), and $\theta = 0$ if they do not increase (decrease) dollar prices at all when the dollar depreciates (appreciates).

income ''taste'' parameters can be symmetrical, yet higher trend capacity growth abroad (because of such countries as China) than at home can drive US imports to grow more rapidly than exports.

With real exports and imports in hand, nominal values are obtained by applying expected export and import price levels. The set of price and nominal trade and income identities is

$$\begin{aligned} M_t &= M^*_t P_{mt}; \\ X_t &= X^*_t P_{xt}; \\ Y_t &= Y_{t-1}(1 + g_{dt})(1 + \dot{P}_d); \\ P_{mt} &= P_{m,t-1}(1 + \dot{P}_{mt}); \\ P_{xt} &= P_{x,t-1}(1 + \dot{P}_{xt}) \end{aligned} \tag{3.3}$$

where $\dot{P}$ equals the inflation rate (proportionate terms) for the variable in question, Y is nominal GDP, and P_d is the GDP deflator.

Import and export price inflation rates are predicted as follows:

$$\begin{aligned} \dot{P}_{mt} &= a_m + b_m\dot{P}_{dt} + \theta\dot{R}^*_t; \\ \dot{P}_{xt} &= a_x + b_x\dot{P}_{dt} + (1 - \phi)\dot{R}^*_t \end{aligned} \tag{3.4}$$

The past several years have shown that import and export prices tend to lag behind domestic inflation. Also, there is some degree of pricing to market on both the export and, especially, import sides. Otherwise, export price inflation could simply be set at that for domestic production ($a_x = 0$, $b_x = 1$, $\theta = 0$), and import price inflation at domestic inflation plus the proportionate rise expected from real exchange rate depreciation ($a_m = 0$, $b_m = 1$, $\phi = 1$).

Transfers in the current account are simply projected at a fixed proportion of GDP based on recent experience, or

$$TR_t = \tau Y_t \tag{3.5}$$

The capital services account is then built up from projections of the main components of external assets and liabilities, and from application of expected corresponding rates of return. Direct investment flows abroad are projected at their average ratio to GDP in recent years, as are direct investment inflows from abroad. Stocks of direct investment then equal the previous year's stock, plus the annual flow, plus valuation changes for exchange rate change and price change. Price change is simply set at the US GDP deflator rate, for both sides. Thus:

$$\begin{aligned} FDIA_t &= FDIA_{t-1}(1 + \dot{P}_{dt} + \dot{R}^*_t) + FDIAF_t = FDIA_{t-1}(1 + \dot{P}_{dt} + \dot{R}^*_t) + \pi_a Y_t; \\ FDIL_t &= FDIL_{t-1}(1 + \dot{P}_{dt}) + FDILF_t = FDIL_{t-1}(1 + \dot{P}_{dt}) + \pi_L Y_t \end{aligned} \tag{3.6}$$

where *FDIA* is the stock and *FDIAF* is the flow of direct investment abroad; *FDIL* is the stock and *FDILF* is the flow of foreign direct investment in the United States; π is the parameter expressing annual flow of direct investment as a proportion of GDP; and subscripts a and L refer to assets (outflows) and liabilities (inflow) respectively.

Portfolio equity stock valuation adjustments are similarly applied on the external asset side for dollar depreciation and inflation and on the liability side for inflation. Annual flows of portfolio equity investment are obtained by applying the current-year real GDP growth rate to the end of previous-year stock, with the effect of maintaining the real stock of portfolio investment. Portfolio investment stocks are thus:

$$PEA_t = PEA_{t-1}(1 + \dot{P}_{dt} + \dot{R}^*{}_t) + PEAF_t = PEA_{t-1}(1 + \dot{P}_{dt} + \dot{R}^*{}_t + g_{dt});$$
$$PEL_t = PEL_{t-1}(1 + \dot{P}_{dt}) + PELF_t = PEL_{t-1}(1 + \dot{P}_{dt} + g_{dt}) \qquad (3.7)$$

where *PEA* is the stock and *PEAF* is the flow of portfolio equity assets abroad; and *PEL* is the stock of portfolio equity liabilities abroad and *PELF* is the annual flow of foreign purchases of US portfolio equity.

All other external assets and liabilities are either bonds, bank claims, or nonbank claims, and are aggregated into assets abroad *(BBNA)* and liabilities abroad *(BBNL)*. It is this category of external liability that becomes the balancing category for accumulation of additional net debt abroad as a consequence of the current account deficit and net capital flow in other categories. For projection purposes, it is simply assumed that *BBNA* assets abroad remain unchanged. The balancing item is thus *BBNL* external liabilities, which increase each year by the amount of the current account deficit plus (or minus) additional financing requirements (or availability) from net outflows (inflows) of direct investment and portfolio equity. A key difference between these credit instruments and the equity (direct and portfolio) instruments is that credit claims have no valuation adjustments for inflation or for exchange rate change. It is assumed that all credit claims (on both sides) are denominated in nominal dollars.

The current account balance for each year must be calculated sequentially in order to obtain the balancing increment in credit liabilities abroad (change in *BBNL*). The current account balance equals the balance on goods and services, plus transfers, plus the balance on capital services *(KSV)*. The latter is obtained by applying rates of return to external assets and liabilities. Thus:

$$KSV_t = \rho_1^a FDIA_{t-1} + \rho_2^a PEA_{t-1} + \rho_3^a BBNA_{t-1} - \rho_1^L FDIL_{t-1} - \rho_2^L PEL_{t-1} - \rho_3^L BBNL_{t-1} \qquad (3.8)$$

where ρ is the rate of return on the asset, superscript a refers to asset and L to liability, and subscripts 1, 2, and 3 refer to direct investment, portfolio equity, and the aggregate of bonds and credit claims, respectively.

The current account is then obtained as

$$CA_t = X_t - M_t + TR_t + KSV_t \tag{3.9}$$

With non-equity liabilities abroad as the balancing item, non-equity liabilities and assets are then

$$BBNL_t = BBNL_{t-1} - CA_t + FDIAF_t - FDILF_t + PEAF_t - PELF_t;$$
$$BBNA_t = BBNA_0 \tag{3.10}$$

where external non-equity assets *(BBNA)* remain unchanged at the base year value.

This system thus provides projections of the current account balance and the components of the net international investment position (NIIP), which is simply

$$NIIP_t = FDIA_t - FDIL_t + PEA_t - PEL_t + BBNA_t - BBNL_t \tag{3.11}$$

Calibration and Data

Table 3.1 presents the parameter values applied to the model. This main version of the model may be designated ''KGS,'' for a Krugman and Gagnon symmetrical elasticities structure. An alternative variant is also run based on the more traditional Houthakker-Magee asymmetrical (HMA) elasticities structure. In both models the price elasticity is set at unity for both import and export demand, a value Gagnon (2003) describes as ''typical for the literature.'' The exchange rate pass-through ratio is set at 0.5 for imports and 0.8 for exports, again representative values from the literature (Hooper and Marquez 1995). In the KGS model, the income elasticity is set at 1.5 on both the import and export sides, and an elasticity on output capacity growth of 0.75 is applied on both sides as well. These income and capacity elasticity values are central estimates suggested by Gagnon (2003) for implementation of a Krugman-type model in which expansion of foreign capacity adds new ''varieties'' to imports and boosts import magnitudes independently of a rise in domestic income or an observed reduction in relative import price for the ''old'' varieties (i.e., the influence of the real exchange rate).[3] In this model, any secular slide

3. In a subsequent paper, Gagnon (2004) conducted estimates suggesting that the coefficient relating export growth to home GDP growth is higher—at or above unity—and that the theoretically expected value should be unity. However, this set of results finds export price elasticities that are considerably lower than usually encountered in empirical trade studies. In part for this reason, the implementation of the KGS model here uses the lower coefficient of exports on home GDP, 0.75, suggested by Gagnon in his 2003 paper. In part, this quantification can be thought of as treating the world as substantially but not entirely of the ''different varieties'' structure in the underlying model of Helpman and Krugman (1985) invoked by Gagnon.

Table 3.1 Projection model parameters

Parameter	Concept	Value
α	Import price elasticity	-1
β	Export price elasticity (absolute value)	1
γ	Import income elasticity	1.5 (1.7)
η	Export income elasticity	1.5 (1.0)
δ	Import foreign capacity elasticity	0.75 (0)
ε	Export US capacity elasticity	0.75 (0)
λ	Import cyclical income elasticity	2
Ω	Export cyclical income elasticity	2
θ	Import pass-through ratio	0.5
ϕ	Export pass-through ratio	0.8
$\hat{g}_d$	Trend US growth	0.035
a_m	Import inflation constant	-0.018
b_m	Import inflation coefficient on domestic inflation	1
a_x	Export inflation constant	-0.018
b_x	Export inflation coefficient on domestic inflation	1
τ	Transfers/GDP	0.0065
π_a	Annual FDI outflow/GDP	0.013
π_L	Annual FDI inflow/GDP	0.0123
$\dot{P}_d$	US GDP deflator inflation	0.018
g_d	US growth rate	0.035
g_f	Foreign growth (US X wts)	0.031
gc_f	Foreign capacity growth (US M wts)	0.035
$\rho^a{}_1$	Return on FDI assets	0.071
$\rho^L{}_1$	Return on FDI liabilities	0.025
$\rho^a{}_2$	Return on portfolio equity assets	0.022
$\rho^L{}_2$	Return on portfolio equity liabilities	0.022
$\rho^a{}_3$, $\rho^L{}_3$	Return on bonds, loans	Variable

FDI = foreign direct investment

Notes: Main values: Krugman-Gagnon symmetrical (KGS) model. Houthakker-Magee asymmetrical (HMA) model parameters are in parentheses.

toward trade deficit for the United States arises not from Houthakker-Magee income elasticity differences but from more rapid growth in foreign capacity (and hence imports) than domestic capacity (exports). In the alternative HMA model, the import income elasticity is set at 1.7 and the export foreign income elasticity at 1.0 (the values used by Mann 2004), while the capacity elasticities are set to zero on both sides.

The cyclical import and export elasticities are set at 2, which essentially boosts the income elasticity to 3.5 on both sides for the increment in the growth rate above the long-term trend rate. This term helps capture the decline of imports during US recession (because the difference term becomes negative), and the decline of US exports during recession abroad. Trend US growth is set at 3.5 percent annually, and trend foreign export-weighted growth is set at 3.1 percent.[4]

4. Real US GDP grew at a compound rate of 3.7 percent from 1992 to 2000, and at 3.2 percent from 1992 to 2003 (incorporating the 2001 recession). Foreign growth, weighting by US exports, averaged 3.18 percent during this period.

The parameters for the import and export price equations are based on trends estimated in simple regressions of annual proportionate growth in trade prices against the corresponding annual US GDP deflator inflation and the proportionate rise in the real exchange rate (dollars per foreign currency).[5] The estimated coefficients on domestic inflation are close to unity, so a value of 1 is applied on both sides. Also, the constant terms on both sides imply trade price deflation of close to 2 percent annually if domestic inflation reaches zero. The constant terms are both set at –0.018, for compatibility with the projections' assumption of annual domestic inflation (GDP deflator) of 1.8 percent. Finally, on the import side the estimated coefficient on the real exchange rate (0.44) is close enough to confirm the assumed pass-through parameter of 0.5. On the export side, the pass-through parameter of 0.8 is simply imposed, because the estimated coefficient has the wrong sign.

The term for net outflow of transfers is based on the average rate in 2002–04 (0.65 percent of GDP), which is significantly above the average of the previous decade (0.56 percent). The parameters for direct investment outflow and inflow as a fraction of GDP are set at their averages for 1993–2003. In the main forecast variants, the US GDP is projected to grow at 3.5 percent over 2005–10 (after rising 4.2 percent in 2004). Foreign growth is based on the average growth of the 36 economies in the Federal Reserve broad exchange rate index as weighted by shares in US exports. Foreign capacity growth weighted by US import shares is based on growth for the same countries. Both rates are set close to the actual rates for 1992–2003.[6] Higher growth weighting by imports reflects the fact that US import shares are higher than export shares for key rapidly growing economies such as China.

The rates of return on the various NIIP components are as follows. Equity returns are based on the 1992–2004 averages, which are 7.1 percent for direct investment assets abroad, 2.5 percent for foreign direct investment in the United States, and 2.2 percent for portfolio equity on both the asset and liability sides. Interest rates on both assets abroad and foreign holdings in the United States are set at rates reflecting the asset class. The Treasury bill rate is applied to official reserves and bank claims.

5. See footnote 10 below for derivation of the nonoil import price series. The regression equation estimated for nonoil import price inflation is $\dot{P}_{mt} = -.0197\ (-3.5) + 0.966\ \dot{P}_{dt}\ (5.6) + 0.440\ \dot{R}^*_t\ (8.17)$; adj. $R^2 = 0.77$; t-statistics in parentheses. For exports, the price inflation equation based on domestic inflation alone is $\dot{P}_{xt} = -0.0176\ (-2.3) + 0.82\ \dot{P}_{dt}\ (3.8)$; $R^2 = 0.37$; t-statistics in parentheses. Note, however, that the real exchange rate has the wrong sign in the export price equation, and is thus omitted.

6. The rates are set slightly higher to adjust for recession in 2001. The actual 1992–2003 average for foreign growth weighting by US export shares was 2.94 percent. Weighting by US import shares, it was 3.3 percent.

The medium-term (5-year) bond rate is applied to nonbank claims, and the long-term (10-year) rate is applied to corporate and government bonds. The yield curve is set to its average for the past decade.[7] Because bonds are more heavily represented in US liabilities (especially US government bonds) than in US claims abroad (e.g., bank credits), the weighted interest rate is higher on US debt liabilities *(BBNL)* than on its external credit assets (*BBNA*).[8]

Identifying the Exchange Rate Lag

A crucial question is the appropriate lag to choose for the influence of the real exchange rate on trade. Often analysts and business persons suffer from "exchange rate fatigue" when they lament the failure of the trade balance to improve soon after a sizable depreciation. A lagged effect of up to two years suggests instead that improvement requires patience. Indeed, the J-curve effect will make matters worse due to higher import values in the first year, because the price rises immediately with the exchange rate depreciation while the quantity responds only with a year or two lag.

Past research has shown a lag of about two years (Cline 1989, 1995a). More recent data on the real exchange rate and trade performance continue to suggest that a lag of two years is relevant. Figure 3.1 shows a relatively close relationship between the current year's ratio of nonoil imports of goods and services as a percent of exports of goods and services (nonoilM/X) to the level of the Federal Reserve's broad real exchange rate index for two years earlier.[9]

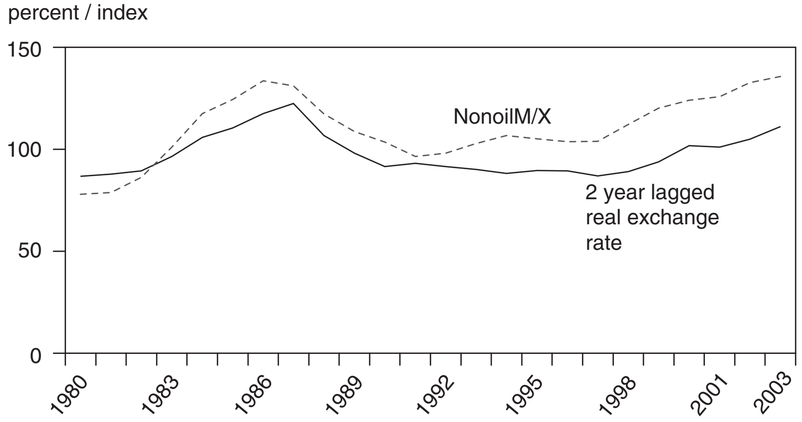
To obtain a more accurate lag specification, simple statistical tests can be applied to estimates of real nonoil imports and real exports from the US national accounts (BEA 2004e) and the real exchange rate. Data on the real exchange rate are for the Federal Reserve's broad index against 36 industrial and developing countries (Federal Reserve Board 2005b, Leahy 1998). The index is in real terms, deflating by consumer prices. The tests indicate that both imports and exports are influenced by the real exchange rate with a one-year and two-year lag. Real nonoil imports

7. The medium-term bond rate is set at 0.79 percent below the 10-year bond rate, and the Treasury bill at 1.77 percent below the 10-year bond rate.

8. Based on end-2003 stocks, 64.7 percent of US credit assets are imputed at the bill rate, 19.4 percent at the medium-term bond rate, and 15.9 percent at the long-term bond rate. In comparison, US debt liabilities are 33.7 percent at the bill rate, 7.1 percent at the medium-term bond rate, and 59.2 percent at the long-term bond rate.

9. In the figure (and the underlying Fed index), the index indicates units of real foreign currency per real dollar, deflating by consumer prices, so an increase indicates real appreciation.

Figure 3.1 Ratio of nonoil imports to exports and lagged real exchange rate, 1980–2003 (percent and index)



NonoilM/X = nonoil imports of goods and services as a percent of exports of goods and services.

Sources: Federal Reserve Board (2005b); BEA (2005c).

are obtained as follows. Nominal nonoil imports are deflated by a price index for nonoil imports of goods and services. This index is derived residually from the overall price deflator for goods and services imports after removing the contribution of the oil price deflator.[10] Real exports are simply the quantity index of exports of goods and services in the national accounts. When these two series are related to the relevant growth variables and lagged real exchange rates (this time inverted for consistency with equations 3.1 and 3.2), the following simple regressions are estimated, using annual data for 1979–2003:

$$\dot{M}^*_t = -0.273\dot{R}^*_{t-1} - 0.238\dot{R}^*_{t-2} + 2.45g_d;\ \overline{R}^2 = 0.692 \qquad (3.12)$$
$$(-1.9) \qquad (-1.62) \qquad (12.2)$$

$$\dot{X}^*_t = 0.387\dot{R}^*_{t-1} + 0.197\dot{R}^*_{t-2} + 1.97g_f;\ \overline{R}^2 = 0.694 \qquad (3.13)$$
$$(3.1) \qquad (1.56) \qquad (11.9)$$

In these regressions, the dependent variable is the percent change of real nonoil imports or real exports in the current year. The independent variables are the percent change in the real exchange rate one or two years earlier, and the percent real growth rate for domestic GDP or foreign (export-weighted GDP). The t-statistics are shown in parentheses.

10. That is: $P_{nom} = (P_m - \phi_o P_o)/(1-\phi_o)$, calculated on an annual chained basis, where P is the price index, "o" is for oil, "nom" is nonoil goods and services imports, and ϕ_o is the share of oil in total imports of goods and services.

These simple regressions confirm that both the one-year lagged real exchange rate and the two-year real exchange rate affect trade on both the import and export sides. Although the statistical significance for the two-year lag is low (at about the 12.5 percent level), the adjusted R^2 results show that inclusion of the two-year lag improves statistical explanation.[11] The results show highly significant influences of income on trade (t-statistics at about 12). The growth parameters confirm mild Houthakker-Magee asymmetry, with the import income elasticity at about 2.5 and the export income elasticity at about 2. Again, however, if capacity considerations were taken into account, this asymmetry would not necessarily persist. As for the exchange rate elasticities, they amount to a combined -0.51 on the import side and 0.58 on the export side. These are completely consistent on the import side with the assumed model parameters of 0.5 for exchange rate pass-through and -1 for price elasticity. On the export side, the coefficient is a bit lower than the assumed parameters would imply (pass-through of 0.8 times price elasticity of 1), but nonetheless confirm a strong relationship despite an extremely simple formulation for the test.

On the basis of equations 3.12 and 3.13, and weighting proportionally by the parameters estimated, on the import side, the weights are 0.53 for the prior year and 0.47 for two years before. On the export side, the corresponding weights are 0.66 and 0.34 respectively. Thus, for imports (e.g., equation 3.2), $R^*_L = 0.53\ R^*_{t-1} + 0.47\ R^*_{t-2}$. Similarly, for exports (equation 3.1), $R^*_L = 0.66\ R^*_{t-1} + 0.34\ R^*_{t-2}$.

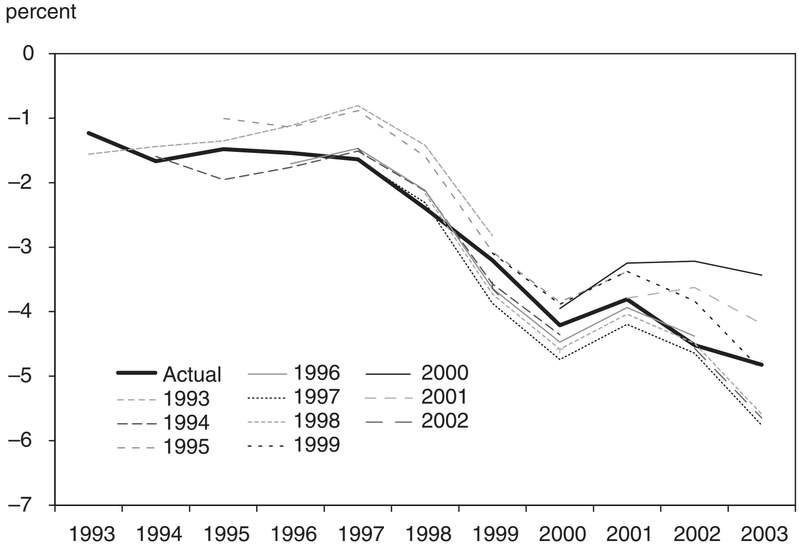
Backcast Performance

Before turning to projections of the current account and NIIP, it is useful to consider how well the model would have performed in the past. For this purpose, a "backcast" is made, in which the actual values of the independent variables are applied (US and foreign growth, real exchange rate path, US bond rate, and actual price index series for GDP, for exports of goods and services, and for imports of goods and services) to the model to "predict" the trade and current account outcomes.[12] For any given year, there are several backcasts, one for each of several alternative prior base-year applications of the model. For example, if the base year is 1993, actual import and export values in that year provide the basis for application of

11. Note that because the regressions are in percent change form, stationarity is not an issue.

12. For the backcast, the capacity growth terms vary over time and are set at the average of actual growth in the current and two previous years. For import prices, actual values refer to all goods and services, including oil. By the 1990s, the share of oil in imports was sufficiently reduced that the nonoil import price index moved closely with the overall import price index, despite, for example, a large drop in oil prices in 1998 and a large increase in 2000.

Figure 3.2 Current account as a percent of GDP backcasts, KGS model, 1993–2003



KGS = Krugman-Gagnon symmetrical

the model. A 1993 base model generates predictions for 1993–98 (six years is the maximum horizon applied to each base year).[13]

Figure 3.2 shows the backcast outcomes for the US current account deficit for 1993–2003 for the main variant of the model, KGS. The field of backcasts broadly flanks the actual outcome. The base year for each backcast is identified in the key.

Figure 3.3 presents the corresponding backcasts using the HMA variant of the model. Although these also tend to flank the actual outcomes, inspection suggests that the HMA model performance is not as good as that of the KGS model.

A closer examination of the components of the backcasts shows that it is systematic underestimation of US exports as time progresses from the base year, in the HMA version, that leads to the greater divergence from actual outcomes (figure 3.4).

A summary measure for the current account deficit as a percentage of GDP confirms that the fit is better for the KGS model than for the HMA variant. This measure is the square root of the average squared residual of predicted from actual.[14] This weighted average deviation amounts to

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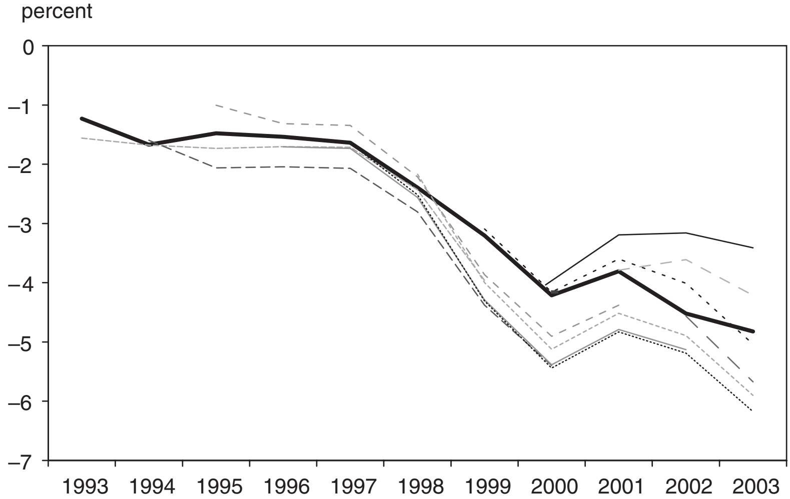
13. Only exports and imports are set at actual levels in the base year, so there is some divergence of the model from the actual current account even in the base year.

14. With s as the summary measure and r_i as the residual of predicted from actual current account deficit/GDP for observation i, and with n observations: $s = (\Sigma_i \, r_i^2 / n)^{0.5}$.

Figure 3.3 Current account as a percent of GDP backcasts, HMA model, 1993–2003



HMA = Houthakker-Magee asymmetrical

Note: Key for figure 3.3 is the same as figure 3.2.

0.56 percent of GDP for the KGS model and 0.74 percent of GDP for the HMA variant. This suggests that the symmetrical elasticity approach of the KGS model, and its incorporation of capacity growth effects, provides a closer approximation of trade and current account performance for at least the past decade than does the more traditional asymmetric elasticity approach of the HMA version.

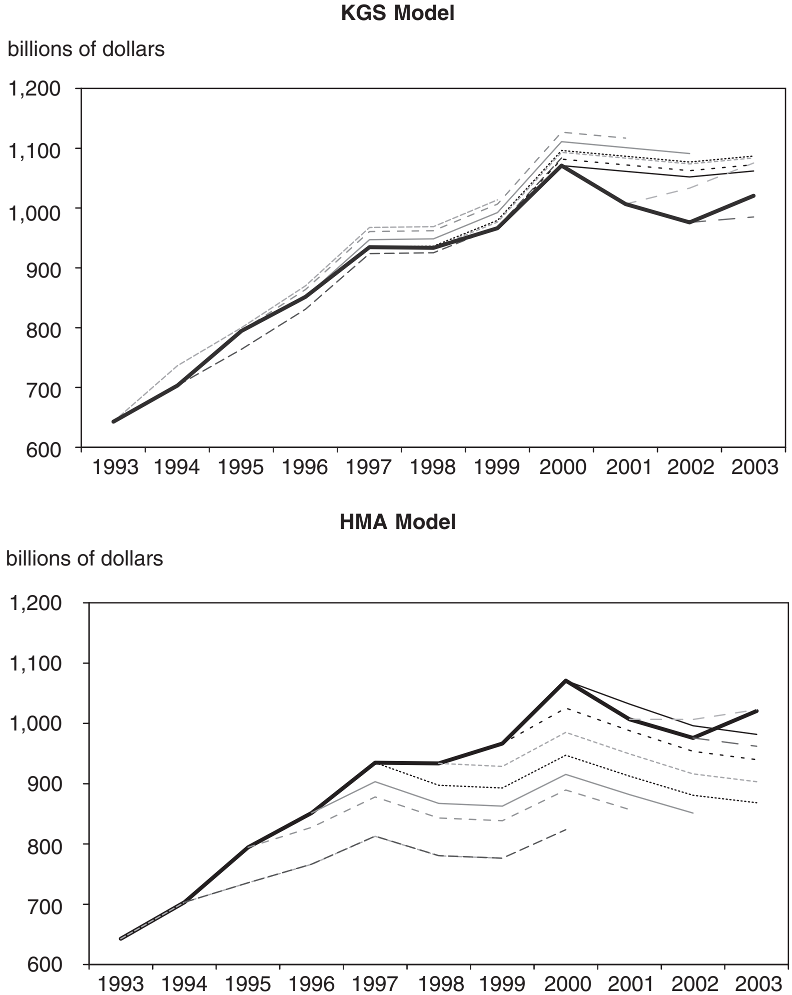
Baseline Projections

The projection model developed above can now be used to obtain alternative forecasts of the US current account deficit and accounting-based NIIP. The corresponding ''economic'' net foreign asset position based on capitalized net capital income (CNCI) flows can also be calculated.

The base year for the projections is 2004, with the adjustments discussed below. The projections for 2005–10 then apply the following baseline assumptions (also see table 3.1):

- The real exchange rate remains unchanged at the average level in the first five months of 2005.
- US domestic growth is a steady 3.5 percent annually.
- Growth of foreign capacity (weighted by US import shares) is a steady 3.5 percent annually.

Figure 3.4 Alternative export backcasts, 1993–2003
(billions of dollars)



HMA = Houthakker-Magee asymmetrical
KGS = Krugman-Gagnon symmetrical

Note: Key for figure 3.4 is the same as figure 3.2.

- Growth of foreign GDP weighted by US export shares is a steady 3.1 percent annually.
- GDP deflator inflation is a steady 1.8 percent annually, while the equations relating import and export price inflation to the GDP deflator and real exchange rate generate zero trade price inflation (in the base case).

- The structure of returns on external assets and liabilities remains the same as described above, with rates for fixed income rising along with the bond rate.
- The long-term (10-year) bond rate rises from 4.3 percent in 2004 to 4.4 percent in 2005 and then 5.5 percent by 2006 and thereafter.[15]
- The price of oil remains at about $50 per barrel over the medium term.

Because the KGS and HMA models do not explicitly separate out oil trade, the projections are adjusted by adding a constant $35 billion (nominal) annually to the import bill otherwise predicted by the models to take account of the rise in oil prices from their 2004 base. Recent oil price futures show light sweet crude oil remaining at about $50 per barrel through end-2007 and still at $47 at end-2008. This $50 benchmark is about 20 percent above the average for 2004 (for West Texas Intermediate oil; IMF 2005a). The total oil import bill in 2004 stood at about $180 billion (BEA 2005a), so applying the 20 percent increment results in an additional $35 billion in total import value not otherwise captured by the models.

A second important adjustment seeks to take account of actual trade trends in the first four months of 2005. In this period, nonoil imports of goods and services were 13 percent higher than a year earlier, while exports were 11.5 percent higher (BEA 2005a). Direct application of the model instead calls for the value of imports to rise by 6.8 percent (before the special adjustment for oil). Export value is projected by the model to rise 12.6 percent in 2005, close to the pace in the first four months. To take account of the stronger-than-projected actual import trend, a special increase of 2.6 percent is imposed on the model estimates for 2005 (prior to the increment for oil).[16]

It is important to emphasize that the baseline already incorporates substantial real depreciation of the dollar. The calculation uses annual averages. The Federal Reserve's real broad exchange rate index for the dollar fell from its highest recent annual level of 111.15 in 2002 to an average of 104.41 in 2003, 99.78 in 2004, and an average of 96.6 in the period January–May 15, 2005. This base was slightly stronger than the December 2004 level (95.25). Calculations applying the Federal Reserve currency weights indicate that if the index had been calculated for December 31, 2004, it would have been even weaker, at 94.30.

15. The 5.5 percent rate is the same as that projected by the Congressional Budget Office (CBO 2005a) in early 2005. Note that for 2005, the average short-term rate is set at 3.15 percent, which places it at a smaller spread below the long-term rate (1.25 percentage point spread) than applied in 2006–10 (1.77 percentage points).

16. This increase is based on the assumption that nonoil import values rise 12 percent in the first half of 2005 from a year earlier, and that the pace then slows to the model-based 6.8 percent rate. The average rate of 9.4 percent is then 2.6 percent above the model-based rate.

The modest rebound of the dollar in the first five months of 2005—by about 2.4 percent in real trade-weighted terms from end-2004—was probably attributable to such factors as uncertainty about the euro in the run-up to the French referendum on the EU constitution; repatriation of retained earnings from abroad during the one-year window for special US tax advantages; and the rise in US interest rates. Nonetheless, the January–May base level used for 2005 stands 3.2 percent below the full-year average for 2004, indicating continuation of a broader downward trend for the dollar. More specifically, the real dollar fell by 13.1 percent from the 2002 annual average to the average for the first five months of 2005 (or, equivalently, foreign currencies appreciated in real terms against the dollar by 15.1 percent).[17]

Table 3.2 shows the baseline projections under the assumptions just enumerated, using the preferred KGS model. The first salient feature about these projections is that they show further erosion through 2010 in the current account deficit as a percent of GDP. The current account deficit widens by 0.3 percent of GDP in 2005, 0.1 percent annually in 2006–07, 0.4 percent annually in 2008–09, and another 0.3 percent in 2010. The deficit reaches 7.3 percent of GDP in 2010, and a sobering if not daunting absolute magnitude of $1.18 trillion.

The pace of the current account erosion is slower than in the recent past, as the average deterioration over the past six years was 0.55 percent of GDP. Essentially, the pipeline effects of the already sizable decline of the dollar should slow but not reverse the erosion of the current account. Overall, these projections indicate that the United States remains far from being on a path of correction of the external imbalance.

For its part, the net foreign asset position substantially deteriorates, in both accounting (NIIP) and (especially) economic (CNCI) terms. Capital services remain slightly positive in 2005, at 0.1 percent of GDP, but then turn negative for the first time in 2006, and by 2010 are contributing about $190 billion annually to the current account deficit. The accounting NIIP moves from about −22 percent of GDP at end-2004 to −27 percent at end-2005 and to −50 percent by end-2010. Capitalizing net capital services flows at the bond rate (as discussed in chapter 2), the economic net foreign asset position (CNCI) shifts from +7.2 percent of GDP in 2004 to −22 percent of GDP by 2010.

An important feature of the NIIP baseline projections is that there is a large deterioration in 2005, as the NIIP jumps from −$2.5 trillion to −$3.3

17. The Federal Reserve's real broad index stood at 99.13 for June 2005, or 2.6 percent stronger than the January–May 15 base used for the baseline projections of this chapter. The rejection of the EU constitution in the French and Dutch referendums pushed the euro down sharply against the dollar, from $1.36 at end-2004 to $1.21 at the end of June (for an increase in the dollar by 12.7 percent against the euro). However, the rise in US interest rates also boosted the dollar against other key currencies in the same period: by 6.4 percent against the Japanese yen, 7.8 percent against the pound sterling, and 2.1 percent against the Canadian dollar.

Table 3.2 Baseline projections, KGS model, 2004–10 (in billions of dollars, in percent, and in ratios)

	2004	2005	2006	2007	2008	2009	2010
Exports, GS	1,151.5	1,296.9	1,434.6	1,554.3	1,669.3	1,792.8	1,925.4
Imports, GS	1,769.0	1,938.4	2,052.7	2,200.2	2,376.5	2,567.0	2,772.6
Trade balance	−617.6	−676.5	−653.0	−680.9	−742.2	−809.2	−882.3
Transfers	−80.9	−80.4	−84.7	−89.2	−94.0	−99.0	−104.4
Capital services	36.2	12.6	−58.9	−87.1	−117.7	−152.3	−191.5
Current account	−668.1	−744.3	−796.6	−857.3	−953.9	−1,060.6	−1,178.1
CA/Y	−5.7	−6.0	−6.1	−6.2	−6.6	−7.0	−7.3
Net foreign assets							
Accounting: NIIP	−2,542.3	−3,346.4	−4,122.1	−4,957.5	−5,888.7	−6,925.4	−8,078.7
NIIP/Y (percent)	−21.7	−27.1	−31.6	−36.1	−40.7	−45.4	−50.3
Economic: CNCI	848.6	286.1	−1,070.8	−1,583.9	−2,139.7	−2,769.3	−3,481.0
CNCI/Y (percent)	7.2	2.3	−8.2	−11.5	−14.8	−18.2	−21.7
ERvaladj	272.3	−81.3	0.0	0.0	0.0	0.0	0.0
Real dollars/FC	0.968	1.0	1.0	1.0	1.0	1.0	1.0
Real dollars/FC (-2)	0.869	0.925	0.968	1.0	1.0	1.0	1.0
Bond rate (ppa)	4.3	4.4	5.5	5.5	5.5	5.5	5.5
FDI return difference (ppa)	4.3	4.6	4.6	4.6	4.6	4.6	4.6

CA/Y = current account balance as percent of GDP
CNCI = capitalized net capital income
ERvaladj = exchange rate valuation change
FC = foreign currency
FDI = foreign direct investment
GS = goods and services
KGS = Krugman-Gagnon symmetrical elasticities structure model
NIIP = net international investment position
ppa = percent per annum

trillion at end-2005 (and from −21.7 to −27.1 percent of GDP). A major reason is that the *appreciation* of the trade-weighted real dollar from end-2004 to the base used for 2005 (January–May 15) causes a modest exchange rate valuation *loss* by end-2005, rather than a large gain as in the past three years.

The baseline outlook is moderately worse if the asymmetric income elasticities variant (HMA) is applied, as shown in table 3.3. The current account deficit reaches 8.1 percent of GDP by 2010, or 0.8 percent of GDP higher than in the symmetrical elasticities (KGS) model.

The much lower income elasticity on the side of exports (1.0) in the HMA model, combined with the absence of a supply capacity elasticity on the export side, leads to a substantially lower path for US exports in this model variant. Although imports also grow somewhat more slowly (as the presence of the foreign capacity elasticity more than offsets the higher import income elasticity of 1.7 versus 1.5 in the KGS model), the trade deficit is wider by 2010 than in the KGS model (at 6.2 percent of GDP rather than 5.5 percent). This is the primary reason the current account deficit is wider by 0.8 percent of GDP in the asymmetrical elasticities structure. If anything, the surprise in this result is that the elasticity asymmetry does not make an even greater difference.

The difference between the paths of net foreign assets (both accounting NIIP and economic CNCI) in the two models is relatively small. NIIP reaches −53 percent of GDP in 2010 instead of −50 percent, while CNCI reaches −23.3 percent instead of −21.7 percent. On the basis of the trends in both the current account deficit and net external liabilities, in qualitative and policy terms the two models tell the same basic story: *The United States is not on an external adjustment path but instead is on a trajectory of a widening external imbalance and rising net external liabilities.*

Comparison with Other Projections

Recent similar long-term projections of the US current account and net external debt by Mann (2004) and Roubini and Setser (2004) warrant special attention for comparison with the projections here. The baseline current account deficit projected by Mann is far worse than the projections in this study, while that of Roubini and Setser is about halfway between those of Mann and the projections here.

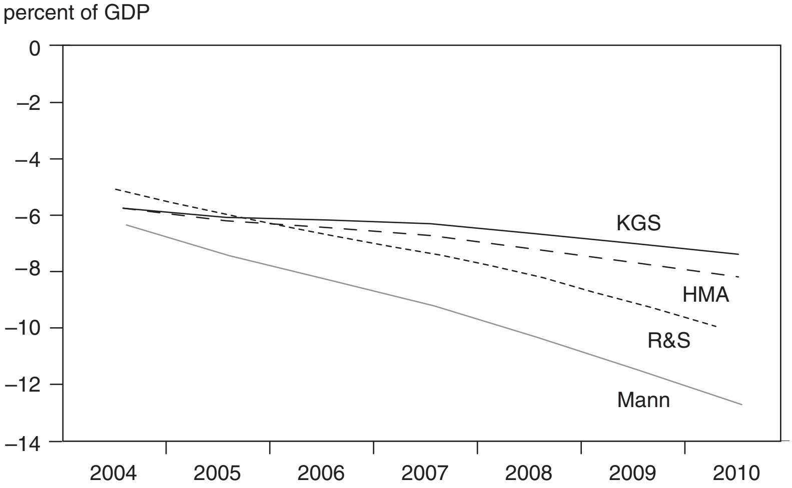
As shown in figure 3.5, Mann projects that under unchanged exchange rates, the baseline US current account deficit would reach 12.7 percent of GDP by 2010. The differences between the Mann baseline and the KGS model baseline used in this study can be decomposed as follows. First, Mann uses asymmetric income elasticities. The HMA variant of the model here uses the same elasticities as Mann (1.7 on the import side and 1.0 on the export side). Second, Mann excludes any lagged exchange rate

Table 3.3 Baseline projections, HMA model, 2004–10 (in billions of dollars, in percent, and in ratios)

	2004	2005	2006	2007	2008	2009	2010
Exports, GS	1,151.5	1,245.0	1,322.1	1,375.1	1,417.7	1,461.7	1,507.0
Imports, GS	1,769.0	1,936.4	2,010.0	2,111.6	2,235.1	2,366.0	2,504.7
Trade balance	−617.6	−691.4	−687.9	−736.5	−817.4	−904.3	−997.7
Transfers	−80.9	−80.4	−84.7	−89.2	−94.0	−99.0	−104.4
Capital services	36.2	12.6	−59.6	−89.6	−122.9	−161.5	−205.7
Current account	−668.1	−759.1	−832.2	−915.2	−1,034.3	−1,164.9	−1,307.7
CA/Y	−5.7	−6.1	−6.4	−6.7	−7.2	−7.6	−8.1
Net foreign assets							
Accounting: NIIP	−2,542.3	−3,361.2	−4,172.5	−5,065.9	−6,077.5	−7,218.6	−8,501.5
NIIP/Y (percent)	−21.7	−27.2	−32.0	−36.9	−42.0	−47.4	−53.0
Economic: CNCI	848.6	286.1	−1,083.9	−1,628.3	−2,235.2	−2,935.8	−3,739.4
CNCI/Y (percent)	7.2	2.3	−8.3	−11.9	−15.5	−19.3	−23.3
ERvaladj	272.3	−81.3	0.0	0.0	0.0	0.0	0.0
Real dollars/FC	0.968	1.0	1.0	1.0	1.0	1.0	1.0
Real dollars/FC (-2)	0.869	0.925	0.968	1.0	1.0	1.0	1.0
Bond rate (ppa)	4.3	4.4	5.5	5.5	5.5	5.5	5.5
FDI return difference (ppa)	4.3	4.6	4.6	4.6	4.6	4.6	4.6

CA/Y = current account balance as percent of GDP
CNCI = capitalized net capital income
ERvaladj = exchange rate valuation change
FC = foreign currency
FDI = foreign direct investment
GS = goods and services
HMA = Houthakker-Magee asymmetrical elasticities structure model
NIIP = net international investment position
ppa = percent per annum

Figure 3.5 Alternative projections of the US current account deficit, 2004–10 (percent of GDP)



KGS = Krugman-Gagnon symmetrical model
HMA = Houthakker-Magee asymmetrical model
R&S = Roubini and Setser

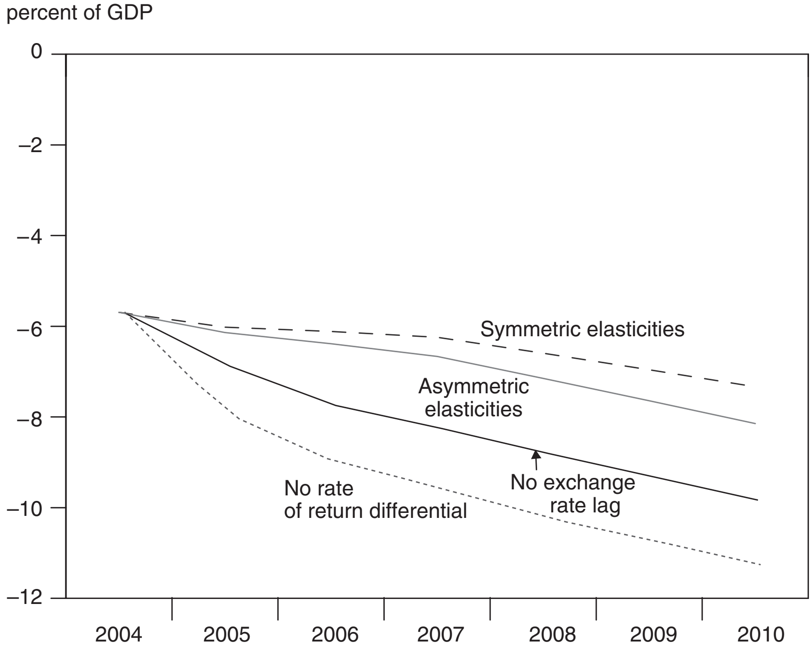
Sources: Mann (2004); Roubini and Setser (2004).

''pipeline'' effects from the depreciation of the dollar after 2002. In contrast, the lag structure in the models developed here means that real trade in 2005 is affected by the change in the real exchange rate from 2002 to 2004, which was a total real foreign appreciation of 10.2 percent.[18] Third, Mann omits any rate of return differential on foreign direct investment assets and liabilities. Fourth, Mann's calculation directly applies the income elasticities to nominal income growth rather than real income growth. This overstates nominal import growth by 1.26 percent annually, or a cumulative 7.8 percent over six years.[19]

18. That is, for 2005 the percent change in real exports and real imports from the 2004 base depends on the change in the weighted 2003–04 exchange rate average from the corresponding 2002–03 weighted average.

19. It can be shown algebraically that applying the income elasticity to nominal rather than real income growth overstates nominal import growth by the rate of inflation multiplied by the excess of the elasticity over unity. For example, suppose inflation is 3 percent, real growth is 3 percent, and the import elasticity is 1.7. The standard calculation would then yield $3\% \times 1.7 = 5.1$ percent real import growth. Adding inflation would yield 8.1 percent nominal import growth. If instead the income elasticity is directly applied to nominal GDP growth, and with nominal real GDP growing at 3 percent plus 3 percent inflation, the result would be estimated nominal import growth of $1.7 \times 6\% = 10.2\%$. The overstatement equals $10.2\% - 8.1\% = 2.1\% = 3\% \times (1.7 - 1)$.

Figure 3.6 US current account under alternative elasticity, exchange rate, and rate of return assumptions, 2004–10 (percent of GDP)



Source: Author's calculations.

Figure 3.6 uses the KGS and HMA models applying the successive changes just described to show the contribution of each of these differences to the overall difference between the Mann baseline and those projected here. The first (most moderate deficit) path has symmetric income elasticities and capacity elasticities, and is the KGS baseline. The second has asymmetric elasticities and is the HMA baseline. The third trajectory takes the HMA baseline and forces the lagged effects from depreciation after 2002 to zero. The fourth trajectory further removes the differential between the rate of return on foreign direct investment assets and liabilities.

As already discussed, the use of asymmetric elasticities boosts the 2010 current account deficit from 7.3 percent of GDP to 8.1 percent (KGS versus HMA). When in addition the influence of the depreciation after 2002 is suppressed, the resulting current account baseline is systematically about 1½ percent of GDP lower than in the main HMA baseline, and by 2010 the current account deficit stands at 9.8 percent of GDP instead of 8.1 percent. When in addition the differential rate of return on foreign direct investment is removed, the current account baseline falls further by about 1 percent of GDP as early as 2005, widening to 1.4 percent of GDP lower by 2010. This brings the 2010 deficit to 11.3 percent of GDP.

The upward bias from application of the import income elasticity to nominal rather than real GDP growth adds another 0.9 percent of GDP to the current account deficit by 2010.[20] Inclusion of this increment brings the projected deficit to 12.1 percent of GDP by 2010, close to Mann's estimate of 12.7 percent. The key economic differences lie in whether one expects lagged exchange rate effects to help arrest the speed of current account deterioration, and in whether one expects the large differential in direct investment returns to continue as it has persistently done in the past (see chapter 2).

The Roubini-Setser baseline projections assume nominal US import growth at 7.25 percent annually and nominal export growth at 5.5 percent annually. Roubini and Setser argue that this was the average over 1990–2003, and that the 2004 level of the dollar was the same as the average for that period (JP Morgan index) and hence trade growth should be about the same. Whatever the merits of this premise, it implicitly adopts asymmetric income elasticities, although not by as much as in the Mann (and HMA) specification. Thus, in the KGS baseline, by 2008 and after, when the pipeline effects of 2002–05 depreciation are complete, nominal imports grow at 8 percent and nominal exports at 7.4 percent, the difference arising solely from differences between US growth at 3.5 percent versus export-weighted foreign growth at 3.1 percent (table 3.1). Nominal import growth relative to export growth at 1.32 to 1 (the Roubini-Setser ratio) implies that the import elasticity is 1.17 times the export income elasticity, a mild asymmetry. On this basis alone, however, the Roubini-Setser baseline should be less favorable than KGS but not less favorable than HMA.

It is in the rate of return assumptions that Roubini and Setser differ more sharply from the projections here. They assume that the differential return will disappear by 2008, and that thereafter the return paid to foreign holders will exceed that earned by US holders of foreign assets. They work at the level of aggregate external assets and aggregate liabilities, rather than applying specific asset class returns as in the model here.[21] Their interpretation not only discards the persistent historical pattern of much higher return on US foreign direct investment abroad than on foreign direct investment in the United States. It also incorporates a major judgment that US creditworthiness will deteriorate and its risk premium escalate because of rising net external debt. This assumption might be valid for an emerging-market economy, but it seems unlikely to be war-

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20. Applying the cumulative 7.8 percent overstatement to the 2004 import base.

21. Roubini and Setser judge that between 2004 and 2008, nominal return on external assets will rise from 3.7 to 4.7 percent. They project that over the same period, nominal return on external liabilities will rise from 2.4 to 4.8 percent, and that this return will then rise further to 5.1 percent in 2010 because "growing U.S. debt will lead the returns foreigners demand on U.S. [assets] to rise. . . ." (Roubini and Setser 2004, 28).

ranted for the United States under circumstances in which the "economic" net foreign liabilities position remains far more modest than that of emerging-market economies below investment grade.

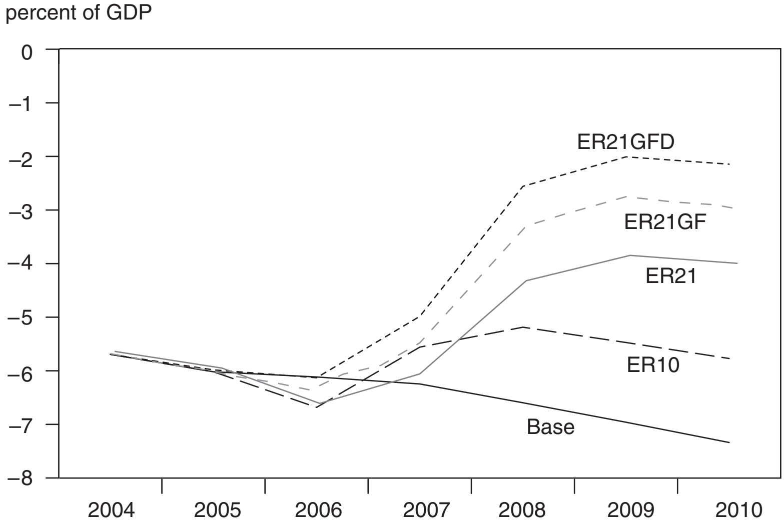
The reversal from favorable to unfavorable return differential on foreign assets versus liabilities is the driving force in the more unfavorable Roubini-Setser current account baseline than that projected here. They project that (without exchange rate or other adjustment) the current account deficit will reach 10.2 percent of GDP in 2010, and that the capital services deficit will be 2.9 percent of GDP. In contrast, even in the asymmetric elasticity HMA model here, the current account deficit stands at only 8.1 percent of GDP in 2010, and the capital services deficit reaches only 1.3 percent of GDP. Their capital return assumptions thus generate three-fourths of the difference from the HMA baseline here. Their trade deficit by 2010 is 0.5 percent of GDP wider than in the HMA baseline, accounting for virtually all of the rest of the difference. This appears to reflect less allowance for the lagged effect of dollar depreciation in 2002 and 2003 on the trade baseline than in the HMA model here.

Overall, both the Roubini-Setser and the Mann baseline projections would appear to overstate the size of prospective current account deficits. However, the differences in the alternative baselines from the estimates here are ones of degree, not direction. Both the KGS and HMA models also indicate a deteriorating path for the already large US current account deficit, even though the deterioration is not as great as projected by the other two studies. A need for external adjustment is thus implied by all of the projections.

Adjustment Scenarios

This section examines the scope for external adjustment in alternative scenarios for the real exchange rate and foreign and domestic growth. These scenarios may be seen as essentially "policy reduced-form," in the sense that they do not spell out the specific fiscal and monetary policies that generate the postulated exchange rate and growth paths, but they do calculate the resulting current account trends given these paths. In broad terms, all of the adjustment paths implicitly involve tighter fiscal policy in the United States, which reduces domestic dissaving and tends to put downward pressure on the interest rate and hence the exchange rate. The paths also involve more stimulative fiscal policy combined with unchanged or tighter monetary policy abroad, which tends to maintain or boost growth while putting upward pressure on interest rates and hence foreign exchange rates. Structural policies that boost foreign growth on the one hand and increase US saving on the other would also ideally contribute.

Figure 3.7 Current account as a percent of GDP under alternative scenarios, 2004–10



Base = KGS baseline
ER10 = 10 percent real trade-weighted foreign appreciation
ER21 = additional 10 percent real foreign appreciation in 2007 (cumulative foreign appreciation of 21 percent)
ER21GF = additional temporary rise in foreign growth above baseline
ER21GFD = additional temporary reduction in US domestic growth

Figure 3.7 shows the projected path of the current account deficit as a percent of GDP using the preferred KGS model under alternative scenarios. The "base" case is the same as that shown in table 3.2. Case ER10 assumes a 10 percent real trade-weighted appreciation of foreign currencies against the dollar (9.1 percent real depreciation of the dollar) in 2006. Case ER21 has a 10 percent real foreign appreciation against the dollar in 2006 and an additional 10 percent foreign appreciation in 2007, for a cumulative real foreign appreciation of 21 percent (or real depreciation of the dollar by 17.4 percent).[22] Case ER21GF also assumes 10 percent real foreign appreciation in both 2006 and 2007, and additionally assumes that foreign growth temporarily rises above the baseline. Case ER21GFD is the same as ER21GF, but in addition assumes a temporary reduction in US domestic growth.

The growth change scenarios are as follows. In ER21GF, export-weighted foreign growth increases by 0.75 percentage point above the base case assumption for three years (2006–07), reaching 3.85 percent. Allowance is made for some corresponding rise in import-weighted potential growth

22. That is, the real price of foreign exchange rises 21 percent, meaning that the real value of the dollar changes by the proportion: $[(1/1.21) - 1] = -0.174$.

capacity based on a 0.5 percentage point increase in foreign growth for the same three years when weighting by US imports, considering that economies with already high growth such as China bulk larger in US imports than exports. For the case with a change in US domestic growth (ER21GFD), it is additionally assumed that US growth is only 3 percent during 2005–07 before returning to the 3.5 percent base case rate. This ease in growth also reduces the 3-year average rate used in the capacity variable on the export side.

A 10 percent real foreign appreciation in 2006 (9 percent dollar depreciation) at first causes a J-curve worsening of the current account deficit from its baseline 6.1 percent of GDP in 2006 (table 3.2) to 6.7 percent in that year, but by 2008 the result is a lower current account deficit at 5.2 percent of GDP instead of the baseline 6.6 percent. The difference of 1.4 percent of GDP provides a useful summary relationship from the model: A 10 percent foreign real appreciation improves the current account balance by 1.4 percent of GDP after two years (as discussed further below). Nonetheless, the adverse baseline trend means that the adjustment is limited and, after narrowing to 5.2 percent of GDP by 2008, the deficit widens again to 5.8 percent of GDP by 2010.

Most analysts consider that an appropriate target for a sustainable current account deficit for the United States is in the range of 2 to 3 percent of GDP. Chapter 5 discusses the sustainable threshold and how it is affected by differential returns on equity. The analysis shows that there would be a cushion from differential returns that might justify a somewhat higher current account deficit, but nonetheless concludes that prudence, as well as uncertainty about the persistence of the differential return over much longer time spans than considered in the projections here, justify adhering to the more traditional target range of about 3 percent of GDP.

The scenario with 21 percent real foreign appreciation (ER21, with 10 percent in 2005 and another 10 percent in 2006) closes much, but not all, of the gap from such a target. In this scenario, the current account deficit narrows to about 4 percent of GDP by 2008, but remains at about that level thereafter. The 21 percent real foreign appreciation of this scenario would bring the dollar from its average level of 96.6 in the first five months of 2005 on the broad Federal Reserve real index to 79.8, which is 8.2 percent lower than its previous annual trough of 86.9 in 1995.

In contrast, if in addition to the 21 percent depreciation there is a temporary acceleration of foreign growth from the baseline, case ER21GF, the current account deficit does narrow to about 3 percent of GDP by 2008, and stays at about that level thereafter. If, in addition, US growth temporarily slows from the baseline, easing demand for imports, the current account would narrow to an estimated 2 percent of GDP by 2009–10. It would be difficult to argue, however, that this additional narrowing would provide welfare gains that would offset those from the lost growth.

Because of the special interest of the just-successful scenario involving 21 percent real foreign appreciation and temporary acceleration of foreign growth, it is useful to examine this case in more detail (table 3.4).

In this case of successful adjustment, the accounting NIIP erodes from −21.7 percent of GDP in 2004 to −29.8 percent in 2010, in comparison to −50.3 percent of GDP in the baseline (table 3.2). The rise in this net external debt is temporarily arrested in 2006 and 2007 by large exchange valuation effects, over $500 billion in each year, thereby trimming about $1 trillion off of the projected NIIP debtor position that would be projected if there were no attention to the exchange rate valuation effect. The erosion of the economic NIIP is sharply curbed from the baseline, as the CNCI reaches only −6.9 percent of GDP by 2010 instead of −21.7 percent.

As noted in chapter 2, Roubini and Setser (2004) argue that there is little future exchange rate valuation gain in the NIIP to be expected from dollar depreciation, because the countries that are home to US direct and portfolio investment have already done their appreciation (Europe), whereas the countries that will be doing the rest of the appreciation do not count for much in US foreign equity assets (e.g., East Asia). However, it is estimated in chapter 2 that only about 35 percent of US foreign nondollar assets are in the euro or currencies of other countries that arguably have already appreciated as much as could be expected in an overall adjustment (Sweden, Australia, and New Zealand). About 34 percent is in currencies of three industrial countries that have not appreciated nearly as much (United Kingdom, Canada, and Japan). The rest is in currencies of Asian, Latin American, and other emerging-market economies that have appreciated very little or even depreciated against the dollar.

As discussed in chapter 2, if the incremental exchange rate changes beyond end-2004 calculated in the optimal realignment exercise of chapter 6 are weighted by US foreign (equity) asset shares, the weighted incremental foreign appreciation is about three-fourths as large as the trade-weighted incremental appreciation. Moreover, in practice, industrial countries may continue to participate relatively more in the exchange rate correction needed for US external adjustment, and the emerging-market economies relatively less, than recommended in the optimal realignment profile. If so, the gap between the trade- and equity-weighted exchange rate changes would be even smaller. Overall, there may be some upward bias in the size of the favorable exchange rate valuation effect on the NIIP in the adjustment scenarios of this chapter, but any such bias should be moderate.

It is important to note that the external adjustment scenario set forth in table 3.4 (case ER21GF in figure 3.7) is far more favorable than those projected in Mann (2004). She estimates that a decline of the dollar to a

Table 3.4 US external deficit and net foreign assets under exchange rate adjustment and acceleration of foreign growth, 2004–10 (in billions of dollars, in percent, and in ratios)

	2004	2005	2006	2007	2008	2009	2010
Exports, GS	1,151.5	1,296.9	1,501.2	1,792.1	2,132.4	2,348.6	2,522.3
Imports, GS	1,769.0	1,938.4	2,157.9	2,368.6	2,439.4	2,582.3	2,792.6
Trade balance	−617.6	−676.5	−691.7	−611.6	−341.9	−268.7	−305.3
Transfers	−80.9	−80.4	−84.7	−89.2	−94.0	−99.0	−104.4
Capital services	36.2	12.6	−53.8	−53.1	−42.8	−53.5	−60.6
Current account	−668.1	−739.7	−830.2	−753.9	−478.7	−421.2	−470.3
CA/Y	−5.7	−6.0	−6.4	−5.5	−3.3	−2.8	−2.9
Net foreign assets							
Accounting: NIIP	−2,542.3	−3,341.8	−3,543.1	−3,558.4	−3,990.4	−4,363.0	−4,782.8
NIIP/Y (percent)	−21.7	−27.0	−27.2	−25.9	−27.6	−28.6	−29.8
Economic: CNCI	848.6	286.1	−978.6	−965.7	−778.4	−972.0	−1,102.6
CNCI/Y (percent)	7.2	2.3	−7.5	−7.0	−5.4	−6.4	−6.9
ERvaladj	272.3	−81.3	608.0	705.8	0.0	0.0	0.0
Real dollars/FC	0.968	1.0	1.1	1.21	1.21	1.21	1.21
Real dollars/FC (-2)	0.869	0.925	0.968	1.0	1.1	1.21	1.21
Bond rate (ppa)	4.3	4.4	5.5	5.5	5.5	5.5	5.5
FDI return difference (ppa)	4.3	4.6	4.6	4.6	4.6	4.6	4.6

CA/Y = current account balance as percent of GDP
CNCI = capitalized net capital income
ERvaladj = exchange rate valuation change
FC = foreign currency
FDI = foreign direct investment
GS = goods and services
NIIP = net international investment position
ppa = percent per annum

Notes: Assumptions: 10 percent real foreign appreciation in 2006 and again in 2007; and foreign growth accelerates above baseline by 0.75 percent per year during 2006–08.

real index of 85 (Federal Reserve broad index), which would be between cases ER10 and ER21 examined here, would leave the current account deficit at 10 percent of GDP by 2010. Mann attributes this to the elasticity asymmetry and the large initial gap between imports and exports. A depreciation of the dollar to 85 on the Federal Reserve real broad index would correspond to two-thirds of the distance between the ''base'' and ''ER21'' scenarios of figure 3.7. This would place the current account deficit in 2010 at about 5 percent of GDP, using the KGS model developed here, likely too large for sustainability but by a much smaller margin than a deficit of 10 percent of GDP. Mann reaches the pessimistic conclusion that it would require not only a 15 percent depreciation of the real dollar but an ongoing 10 percent depreciation every year thereafter, bringing the real dollar index to only 35 by 2010, in order to do no more than compress the 2010 current account deficit to 6 percent of GDP. That outcome, however, would depart from historical experience internationally, in which ''purchasing power parity'' tends to be maintained for real exchange rates within relatively moderate ranges over time. Instead, Mann's path for the real dollar as just described would cause it to lose two-thirds of purchasing power parity in just six years.

In contrast, Roubini and Setser (2004) call for the achievement of a ''strong, smooth, sustained adjustment'' scenario in which the current account deficit falls to 4.5 percent of GDP by 2010. However, this scenario is premised on a particular trade outcome (nominal exports grow at 9 percent while import growth is only 5 percent) rather than developed through a projection model with the real exchange rate and domestic and foreign growth as the variables determining the trade outcome. They only state that in this scenario the real exchange rate ''depreciates substantially over time'' (and, in addition, that the fiscal deficit is cut to 2 percent of GDP by 2008 and zero by 2012).

The scenario exercises presented here would tend toward the conclusion that US external adjustment will be difficult but not impossible. The magnitudes of the implied real depreciation and relative growth rates are within reasonable levels. However, in the absence of any change in real exchange rates and baseline growth, the United States would remain on a dangerous path of escalating current account deficits and net international debt in both accounting and economic terms, even if the pace and extent of this deteriorating path may be less severe than suggested by some other estimates.

Impact Parameters

The various scenario results (and additional runs of the model) can be used to identify parameters for the impact of alternative macroeconomic events on the current account. These parameters are ''partial equilibrium''

Table 3.5 Partial equilibrium macroeconomic impact parameters: Change in current account from baseline (percent of GDP)

	In year:		
Parameter for:	**1**	**3**	**5**
10 percent real foreign appreciation against the dollar (sustained)	−0.57	1.41	1.57
1 percent faster foreign growth for one year	0.39	0.39	0.44
1 percent faster US growth for one year	−0.42	−0.43	−0.48
1 percent higher interest rate (sustained)	−0.31	−0.43	−0.56

in that they assume no parallel macroeconomic phenomenon is induced by the ''event'' in question that has the effect of reducing or increasing the direct effect of the event itself. Four events are considered: a real depreciation of the dollar, a decrease in US domestic growth, an increase in foreign growth, and a rise in the US interest rate. The terminology ''event'' is used instead of ''policy instrument'' to recognize that, with the possible exception of the interest rate, these macroeconomic phenomena are endogenously determined and not direct policy instruments.

First, it is necessary to add one scenario not included above: a rise in the interest rate. When the projection model is shocked by applying a baseline for the 10-year Treasury bond rate that is 1 percentage point higher during 2006–10 than in tables 3.2 through 3.4, the result is to boost the KGS baseline current account deficit from 6.1 to 6.4 percent of GDP in 2006; from 6.2 to 6.6 percent in 2007; and from 7.3 to 7.9 percent by 2010.

Impact simulations of the KGS model can similarly be conducted for a 1 percent shock to US growth in 2006, and for a 1 percent shock to foreign growth in 2006. The resulting impact parameters can then be synthesized (table 3.5).[23]

Comparison of the ER10 scenario against the baseline (figure 3.7) yields the parameters for exchange rate change (foreign appreciation, or dollar depreciation) shown in table 3.5. The first-year effect is adverse because of the J-curve effect. By year 3, however, the 10 percent real foreign

23. Note that these parameters are broadly consistent with those in Cline (1989, 209) once changes in trade relative to GDP are taken into account (and after translating absolute impact estimates in that earlier study into percent of GDP; p. 187). In that study, a 1 percent real depreciation was estimated to produce a 0.15 percent of GDP current account improvement, versus 0.13 percent here. One percent of additional foreign growth was estimated to yield 0.17 percent of GDP improvement in the current account deficit, and 1 percent less domestic growth, a 0.22 percent of GDP improvement. The estimates here are higher because both exports and imports of goods and services have risen relative to GDP since the 1987 base in Cline (1989) (from 7.4 to 10 percent and from 10.6 to 15 percent, respectively). The current study's estimates also incorporate a strong cyclical elasticity for trade, which was absent in the earlier study.

appreciation carried out in year 1 (and with the real exchange rate held constant thereafter) induces a 1.41 percent of GDP rise in the current account balance from the baseline it would otherwise follow, and by year 5, this parameter rises to 1.57 percent of GDP. For the third year (midpoint), this parameter means that each percentage point of foreign appreciation translates into a reduction of about $16.5 billion in the current account deficit, gauged against 2004 GDP, or $20 billion when applied to GDP for the projection year in question (2008).

An increase in the export-weighted foreign growth rate by 1 percent for one year improves the current account balance by 0.39 percent of GDP by year 3.[24] Another run of the model finds that an increase in US growth by 1 percentage point from the baseline in 2006 increases the current account deficit by 0.43 percent of GDP by 2008. Finally, boosting the interest rate by 1 percentage point from the baseline during 2006–10 causes a rising increment in the deficit, reaching 0.43 percent of GDP by 2008 and 0.56 percent of GDP by 2010.

A useful rule of thumb from these results is that three effects have about the same impact on the current account by the third year. A 1 percent reduction in foreign growth for one year, a 1 percent increase in US growth for one year, and a 1 percentage point sustained increase in the interest rate would each cause the current account deficit to widen by about 0.4 percent of GDP by the third year. However, the influence of the higher interest rate grows over time.

24. Again it is assumed that the corresponding rise in US import-weighted foreign capacity growth is based on a smaller rise in growth, set here at 0.67 percent for one year, because of the greater prominence in US imports than in US exports of already high-growth economies such as China.