Rebalancing the U.S. Economy in a Post-Crisis World

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Abstract

The objective of this paper is to explore how the external balance of the United States might evolve in future years as the economy emerges from the recession. We examine the issue both from the domestic perspective of the saving and investment balance and from the external side in terms of the basic determinants of exports and imports and the role of the real exchange rate. Using these two respective perspectives, we highlight (1) causes and consequences of low private and public saving in the US, and (2) sensitivity of trade to variations in the real exchange rate. We highlight the need for sustained depreciation of the dollar to improve the competitiveness of U.S. exports and argue that the current exchange rate is consistent with a significant reduction in the size of the trade deficit. However, the favorable external outlook is very inconsistent with a projected domestic situation of low rates of private saving and a very large public sector budget deficit matched by a cyclically depressed rate of investment. Changes in US corporate tax structure, reconsideration of capital controls, and perhaps some further decline in the level of real exchange rates could help soften the impact of a potentially very hard post-recession landing for the United States.

JEL Codes: F32, F41, F42

The United States has had a substantial current account deficit ever since the mid-1990s. For most of that period, the deficit has increased steadily, reaching a peak of $800 billion or 6.7 percent of national income in 2006. There has been widespread agreement that deficits of that magnitude could not be sustained; thus, there exists a pervasive fear that the economy might be heading toward a hard landing–with an abrupt collapse of the dollar and severe economic disruptions both domestically and globally.

In the fully-employed economy of the mid-decade, the rebalancing of the U.S. economy was viewed as a relatively straight-forward, though politically difficult two-pronged task. It would require: (1) changing the composition of domestic demand away from an over-emphasis on domestic consumption in order to free up resources for increased production in the tradable-goods sector, and (2) expenditure-switching aimed at directing those resources into increased exports. The first goal was often described as a need to increase national saving, and the second as a change in the relative price of U.S.-produced products to make them more competitive in world markets.

For a brief period prior to the financial crisis, it appeared that a relatively benign adjustment might be underway. A real depreciation of the U.S. dollar improved the competitiveness of American products and the current account deficit gradually began to recede during 2007 and the first three quarters of 2008. The improvement would have been even more marked were it not for the sharp increase in the price of petroleum imports. Export volumes grew by 18 percent between the 2nd quarter of 2006 and the 2nd quarter of 2008, while import volumes were flat. The U.S. seemed to have begun a soft landing.

However, there was little evidence of adjustment on the domestic side. The national saving rate continued to decline, turning negative in early 2008 due largely to sharply higher federal budget deficits. It was falling rates of investment, not increases in saving that freed up domestic resources. The government responded to a weakening of residential investment with a temporary tax cut aimed at stimulating consumption, further widening the budget deficit and reducing saving.

All of this changed in the fall of 2008 with the onset of a global financial crisis centered on the United States. There has been a severe contraction of domestic demand and employment, and concerns about the composition of aggregate demand have largely

vanished in the midst of extreme countercyclical policies aimed at stabilizing the economy. The external economy experienced an even larger collapse as global trade declined 25 percent below trend in the first half of 2009. U.S. exports fell 20 percent below year earlier levels, with imports falling an even larger 28 percent. In 2009, the U.S. current account deficit is estimated to have been only 3.5 percent of national income–half its value in the peak year of 2006. Perversely, the U.S. real exchange rate also soared at the onset of the crisis– temporarily reversing about half of the prior decline from its peak as investors sought a safe haven in U.S. treasury securities. By the end of 2009, the dollar had reversed about half of the prior rise and the real exchange rate had returned to its average of the early 1990s.

What will be the future of external rebalancing, and should it still be a major policy concern? The recession is ending, but most forecasts for the United States suggest a weak recovery with high levels of unemployment continuing for several years. Furthermore, distortions in the domestic saving and investment balance are far worse than before the crisis: the fiscal deficit has pushed the national saving rate highly negative and the rate of net investment is a third that of the pre-crisis years. In the financial crises of other countries, recovery was largely driven by improvements in the trade balance (export-led growth). However, such a scenario may be difficult in a global recession where most countries will see increased exports as a solution to their problems. Will the recovery of trade flows leave the United States with an imbalance comparable to that of the pre-crisis years?

The objective of this paper is to explore how the U.S. economy and its external balance might progress in future years. In the next section, we review the evolution of the external imbalance over the past quarter century -- both from the domestic perspective of the saving and investment balance and from the external side as reflected in the U.S. current account imbalance and international investment position. The bulk of the paper then focuses on future challenges to external rebalancing from both the domestic and external perspectives. We examine the causes of low private saving in the United States and how it might evolve in the future. Second, we highlight the challenges faced by the public sector as the result of the aging of the population and continued rapid growth of health care costs. On the external side, we summarize the recent research on

the determinants of trade flows and other elements of the current account. We focus particularly on the sensitivity of trade to variations in the real exchange rate and on concerns related to U.S. export performance. Finally, we pull these strands together to consider the risks to a resumption of the soft landing that the crisis has arrested.

Retrospect

Much of the debate and confusion surrounding the sources and consequences of the U.S. imbalance in its economic relations with the rest of the world are due to the different perspectives from which the external imbalance can be analyzed. For example, the current account is defined as the difference between the incomes earned on exports and other transactions with the rest of the world and payments to foreigners for imports and other services.[1] The dominant role of exports and imports leads to a natural focus on the determinants of trade with other countries, such as exchange rates and the relative openness of markets. It also often leads to claims of "unfair" trade practices. From a domestic perspective, however, the current account is also the difference between the nation's total income and its total expenditures: thus, a current account deficit can be said to be the result of the nation spending more than it earns, living beyond its means, and thereby borrowing from the rest of the world. The two perspectives are largely differing sides of the same phenomenon, varying perhaps in the initiating source of any change. It is useful to review the imbalance from both of these perspectives, recognizing the interactions and the importance of both sets of factors. Moreover, the issues are inherently global because of a third requirement that national imbalances must be offset on a global basis, so that the deficits of some countries are matched by surpluses of others.

External Balance. Figure 1 shows the evolution of the U.S. external balance over the past quarter century. The balance of net resource flows as measured by the current account is shown in the top panel, and the cumulative net international investment (stock) position of the United States is shown in the lower panel. As the chart makes clear, there have been two episodes of large current account deficits: the early 1980s and the current

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[1] The current account is the sum of three main kinds of external transactions; trade in goods and services, net factor income receipts, and net transfer receipts. Most discussions of external economic relations focus on trade flows because they are the largest component.

episode, which emerged in the aftermath of the Asian financial crisis and has resulted in much larger and longer-lasting deficits. The top panel also shows the recent beginning of a correction after 2006 although it is exaggerated in 2009 by the effects of the economic crisis. The result of a quarter-century of current account deficits is the buildup of a highly negative international investment position that plummeted from a net creditor position in excess of 15 percent of national income in 1980 to a net indebtedness of 27 percent at the end of 2008. It is noteworthy, however, that the balance sheet has not deteriorated as much as would be expected on the basis of the large current account imbalances of the last decade. This is shown in the lower panel of figure 1 by cumulating the current account deficits since 1980 and expressing the result as a share of national income. This indicator suggests that the U.S. debt position would have been expected to exceed 50 percent of national income by 2008. The large difference between the two measures reflects the greater valuation gains on U.S. investments abroad relative to those on foreign investments in the United States.[2] While capital gains and losses are excluded in the official balance of payments accounts, they are included in the balance sheet measures.

The U.S. imbalances are placed in a broader global context in table 1, which provides a simple summary of the distribution of current account balances across major regions of the world for the period of 1980 to the present.   Absent errors and omissions, the sum of the current accounts across all economies should equal zero. Thus, the deficits of some countries will be offset by surpluses of others.[3] The table highlights the sharp dichotomy between the external position of the United States and everyone else. The United States consistently reports large deficits, which are matched by surpluses in most other regions of the globe. Europe's surplus has declined, however, since the mid-1990s; and Japan's surplus has remained basically unchanged for nearly a quarter of a century.

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[2] For example, half of U.S. investments abroad are allocated to direct investment and corporate equities, compared to only a quarter of foreign investments in the United States. The role of capital gains is highlighted in Gourinchas and Rey (2007). In a previous paper, we also argued that some of the discrepancy can be traced to the shifting of reported income by multinational companies to avoid U.S. taxation (Bosworth, Collins, and Reich, 2007).

[3] Prior to the 1970s, current account imbalances were strictly limited, as most national financial markets operated as closed systems. With the emergence of large scale cross-border capital flows, countries have become capable of financing increasingly large imbalances on a sustained basis.

Similarly, little has changed in Latin America. Instead, the offsets to the increased U.S. deficit are concentrated in the emerging economies of Asia and the oil-producing states of the Middle East. Given the rise of oil prices, the surge of saving within the oil-producing regions is not a surprise, but the sudden emergence of a large excess of saving over investment in Asia was less expected. Finally, a large change in the statistical discrepancy over the past decade complicates the problem of relating the U.S. deficit to surpluses in other specific regions.

Trade in goods and services constitutes the largest component of the current account and its balance is driven by rates of growth in foreign incomes (Y_f) and domestic incomes (Y_d) and the relative price of domestic versus foreign-produced goods (q):

(1) $$NX = f(Y_f, Y_d, q).$$

The concept of the real exchange rate provides a simple measure of relative prices and it is defined as the nominal exchange rate (e) multiplied by the ratio of foreign and domestic prices (P_d/P_f):[4]

(2) $$q = e \times (P_d/P_f).$$

Two alternative measures of the U.S. real exchange rate are shown in figure 2. Both are weighted averages of the exchange rates with major trading partners with weights based on bilateral trade flows, and an appreciation of the dollar is shown as a rise in the index.[5] The Federal Reserve reports a measure that uses consumer price indexes to adjust for differential rates of inflation, while JPMorgan publishes an index that is based on producer price indexes for manufacturing goods excluding food and fuels. The long-term movements in the two indexes are very similar, but the JPMorgan index indicates a slightly larger decline prior to the 2008 crisis and a sharper initial rise. Both indexes suggest that an adjustment was underway well before the crisis.

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[4] We measure the exchange rate as the foreign price of domestic currency so that an appreciation of the currency is recorded as an increase in the exchange rate index.

[5] Market shares of U.S. goods in foreign markets and foreign goods in U.S. and third-country markets are used to construct the currency weights. The weights are updated on an annual basis in the FRB index, while those of JPMorgan change about once per decade. An advantage of the JPMorgan index is that comparable measures are provided for all of the major trading economies.

The real exchange rate also shows a very strong negative correlation with the current account balance reported in figure 1. It seems evident that a currency appreciation is associated with a deteriorating current account balance. But, it is also true that the exchange rate only affects trade flows with a substantial lag because it takes time for exporters and importers to adjust to their competitive positions. A simple means of summarizing the relationship is provided in figure 3, which graphs the non-oil trade balance against a three-year weighted average of the exchange rate.[6] While trade is affected by other factors, it seems very evident that, after accounting for lags, the exchange rate plays a fundamental role. There is also evidence that the relationship has been shifting down over time. We explore these issues more fully in a later section.

The continuing deterioration of the U.S. international investment position generated frequent forecasts of hard-landing scenarios based on a view that foreign investors would ultimately become unwilling to accumulate steadily rising shares of U.S. assets in their portfolios. Many of those scenarios envisioned a 'sudden stop' of capital inflows to the United States, leading to an uncontrolled fall in the value of the dollar and sharply higher U.S. interest rates. Paradoxically, the crisis that emerged in 2008 seems more related to a surplus of capital inflows rather than any shortage, and the dollar surged in value with the onset of the crisis. Some of these observers now perceive the crisis to have been the result of an excessive willingness of foreigners to allocate funds to the U.S., which in turn contributed to a series of speculative bubbles in U.S. asset markets.

Internal Balance. It is notable that for most of the past three decades a growing trade deficit has been associated with a buoyant domestic economy, rapid job growth, and a decline of unemployment to unprecedented levels. This domestic strength suggests that the trade deficit was not something forced on the U.S. economy by outside pressures, but rather a response to changing domestic economic conditions that pushed aggregate

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[6] The non-oil trade balance is measured as a percent of GDP and the exchange rate is a weighted average of the FRB index with weights of .25, .5, and .25 on the rates lagged one, two, and three years. The figure is based on an earlier presentation in Baily and Lawrence (2006).

demand beyond the nation's productive capacity.[7] The excess demand was satisfied in a noninflationary way by exporting less and importing more. This was accomplished by an increase in foreign financial investments in the United States coming from a rise of saving relative to investment in other countries, a large growth of supply capacity in countries that export to the United States, and a stable or rising value of the dollar. The changing composition of aggregate demand, shown in table 2, highlights the growing emphasis on private consumption as the secular counterpart to the growing trade deficit. Between 1980-84 and 2000-06, the share of GDP devoted to consumption rose by 5 percentage points, investment declined by 0.5 percent, and the net trade deficit increased to 4.5 percent of GDP. However, the two episodes of marked reduction in the trade deficit–the late 1980s and the current period–are both notable for sharp cyclical reductions in domestic investment, not a scaling back of consumption.

A domestic perspective also emphasizes the relationship between the nation's current account and its balance of domestic saving and investment. This follows directly from the basic national accounts identity that total domestic output (GDP) equals the sum of public and private consumption expenditures (C), investment (I), and exports (X), minus imports (M):

(3) $\qquad GDP = C + I + X - M$, which can be rewritten as

(4) $\qquad X - M = GDP - C - I$,

$\qquad\qquad = S - I$.

That is to say, the trade balance is equal to saving minus investment.

The situation is slightly more complex in practice because the residents of a country can earn income from overseas activity as well as from domestic production. Thus, the national accounts distinguish between gross domestic production (GDP) and gross national income (GNI), where GNI includes net earnings from abroad. In addition net transfers are added to both sides of the identity. The result is a small redefinition of national saving:

(5) $\qquad CA = (GNI - C) + NTR) - I$, or

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[7] If the deficit were the result of foreign production being unfairly dumped into the U.S. economy, we would expect ongoing problems of excess unemployment and job shortages, something that was not evident prior to the financial crisis.

$$CA = S - I.$$

Thus, the current account (external) imbalance is precisely matched by an (internal) imbalance between national saving and investment. Finally, the U.S. national accounts are structured to measure income, saving, and investment net of the depreciation of physical capital.[8]

A summary of the U.S. saving and investment balance is shown in table 3 for the period of 1960-2009. For several decades prior to the mid-1980s, variations in the net national saving were largely driven by changes in government saving, as the private saving rate was very stable and largely free of any trend. The simultaneous emergence of a large federal budget deficit and a current account deficit in the early 1980s, for example, gave rise to an emphasis on the "twin deficits." The two were viewed as linked thorough the financial pressures of financing a large budget deficit leading to higher U.S. interest rates, an appreciation of the exchange rate, and a trade deficit. However, the re-emergence of a large current account deficit in the late 1990s, despite a rapidly improving fiscal situation, suggested that the notion of a special link between government budget deficits and the external balance was an overly simplistic interpretation. Instead, the gap between saving and investment in later years can be traced to a large drop in the private saving rate–due in turn to sharply lower rates of household saving–and strong investment demand. The boom in information technology during the 1990s made the United States a particularly attractive location for business investment, and a strong expansion of residential investment also contributed to the growing domestic imbalance. The magnitude of the decline in household saving remains something of a puzzle, despite extensive research; some of the potential reasons are discussed more fully in a following section.

The economic crisis has brought on another major realignment with household saving showing a modest increase, but investment demand has collapsed. Moreover, government budget deficits have reemerged during the current decade as a significant

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[8] The emphasis on net measures of saving and investment is also common for other advanced economies; but many developing economies do not undertake detailed estimates of capital depreciation, and they present estimates of saving and investment on a gross basis.

source of the low national saving rate, and extraordinary fiscal actions in 2008-09 turned the national saving rate negative.

Finally, the national accounts include a significant statistical discrepancy that at times has made it difficult to fully reconcile short-run changes in the current account with the domestic S-I balance. For example, there is much less evidence of an improvement in the S-I balance after 2006 than is observed in the reported current account. Instead, the statistical discrepancy changed from a large negative residual in 2005-06 to a positive value for 2008-09.

Why Don't Americans Save

A correction in the external imbalance will require both an increase in private and government saving, but the decline in private saving has been particularly dramatic. Private saving consists of the saving of households and corporate retained earnings, but the entire secular decline is within the household sector (table 3). The household (personal) saving rate fell from an average of seven percent of national income in the early 1980s to approximately two percent in the middle of the last decade.

The fall in household saving has been most puzzling because the movement of the baby-boom generation into the ages of peak retirement saving was expected to cause a rise in the total saving rate. The second surprise has been a large rise in the wealth-income ratio in the face of the declining rates of saving. In other words, if Americans save so little, why are they so rich? One consequence has been a shift away from a focus on demographic explanations for saving behavior to a greater emphasis on the role of wealth in influencing consumption decisions.

The conventional measure of saving excludes all forms of capital gains; yet many economists have argued that wealth changes are a far better measure of changes in economic well-being than rates of saving alone.[9] Indeed, at the individual level there is much to be said for focusing on wealth accumulation rather than saving. By enabling greater future consumption, wealth is an important element of economic well-being, and it matters little how the individual accumulated it. Thus, at the level of individual

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[9] Some of the most cited references are Auerbach (1985), Hendershott and Peek (1989), Bradford (1991), Eisner (1991), Gale and Sabelhaus (1999), and Peach and Steindel (2000).

households, economists often focus on wealth as the best indicator of preparedness for retirement.

At the aggregate level, however, the issues are more complex. The measure of saving is part of a system of national accounts aimed at reporting the level of current production and its allocation among alternative uses and recipients. Those flow accounts can be embedded in a more complete framework of wealth accumulation that makes a sharp distinction between saving and valuation changes. That is, the change in wealth is equal to saving plus the revaluation of existing wealth,

(6) $$W_t = W_{t-1} + \left(\Delta P_t \big/ P_{t-1} \right) * W_{t-1} + S \text{, where}$$

W_t is equal to wealth at time t, and $\Delta P_t/P_{t-1}$ is the average revaluation of the wealth components due to asset price changes. There are, however, limited advantages to introducing valuation changes directly into the national accounts. The inclusion of valuation changes would reduce the usefulness of the accounts in measuring changes in production; and, while most economists would agree that wealth and income are both important determinants of consumption, few would go so far as to argue that the marginal propensity to spend out of wealth is anywhere near that for changes in income.[10] It seems preferable to maintain the existing framework, but to include wealth and its changes as a major determinant of saving.

From this perspective, it appears that the strong capital gains in equities and home ownership over the past two decades may have played an important role in stimulating consumption. In figure 4, we show the pattern of change in the household wealth-income ratio since 1980 and separate the contribution of saving to wealth accumulation from that of valuation changes. Prior to the mid-1990s, valuation changes were a minor source of wealth gain, as most asset prices simply rose in line with the overall rate of price inflation, and household wealth varied within a narrow range of 4-5 times disposable income. More recently, increases in the relative prices of housing and equities raised the wealth-income ratio to 6 times income in 1999 and 2004-07. In contrast, the contribution of

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[10] In addition, not all wealth changes will have the same aggregate effects. For example, increases in home values are seen as a gain to current homeowners, but in the aggregate they are largely reflective of an intergenerational transfer as younger families pay higher prices to older homeowners to purchase the same flow of housing services.

saving began to decline in the 1990s; and by 2007, the wealth-income ratio exclusive of capital gains had fallen to 3.5 compared to a pre-1995 average of 4.5. Thus, it is evident that reduced saving has slowed the rate of wealth accumulation, but valuation changes have played a greatly increased role.

In the typical empirical formulations of the life-cycle model of consumption, researchers estimate a long-run effect of a change in wealth on consumption of about 0.05.[11] That magnitude would suggest that an increase in the wealth-income ratio from 4.75 time income in the 1980s to about 6 times in 2000-07, contributed to a rise in the share of consumption in disposable income of 5-7 percentage points–a large proportion of the observed decline in the saving rate since the early 1980s. However, there is a wide variation in the empirical results and some studies maintain that the effects differ among the various categories of wealth, such as equities and housing.[12] It is even more difficult to distinguish a causal relationship from the fact that consumption and asset valuations are influenced by many common factors. Finally, it is notable that a significant portion of the decline in saving preceded the surge in wealth valuations that began in the mid-1990s.

A variety of other factors have also been put forth to explain the collapse of saving. For example, some researchers would redefine saving to include consumer durables, make adjustments to offset the effects of inflation, or propose differing treatments of retirement accounts. However, as emphasized by Reinsdorf (2007), none of the adjustments change the fundamental conclusion of a large secular decline in the saving rate. More importantly, the alternatives provide little reason to anticipate a future turnaround.

The research on household saving behaviour has left us with a great deal of uncertainty about future trends. The link in the life-cycle model between saving and desired wealth accumulation would suggest that saving will rise in future years because

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[11] Poterba (2000) provides a review of previous articles. More recent macroeconomic studies are those of Case, Quigley, and Shiller (2005) and Belsky and Prakken (2004).

[12] The effect of variations in housing wealth on consumption is particularly controversial. Buiter (2008) and Sinai and Souleles (2005) have argued that home ownership is largely a hedge against future rent costs; and to the extent that the home value is equal to the present value of future consumption of housing services, fluctuations in home prices should imply no net aggregate wealth gain.

the forces that have sustained wealth accumulation in the face of depressed saving cannot continue indefinitely. As we have learned from the current crisis, neither equity nor housing prices are likely to outrun the growth of nominal incomes and substitute for saving to the extent of that they have over the past two decades. The magnitude of the asset losses during the financial crisis should accelerate that process. However, other explanations that emphasize demographic factors, the growth of the public pension system as a substitute for private retirement saving, and behavioural factors would point to a more permanent shift toward a low rate of household saving. We would conclude that any reversal of the private saving rate is likely to be modest in the near future and that a full recovery of national saving to its historical norm near 10 percent of national income will require a substantial change in the fiscal condition of the public sector.

Public Sector Fiscal Balance

As mentioned earlier, there is no longer much support for the "twin deficits" notion of a direct one-for-one link between budget deficits and the current account. Government saving and investment, however, are still important components of the overall accounting identity linking national saving, investment and the current account, and rejection of the twin deficits view does not imply that variations in the fiscal balance have no implications for the current account. Yet, because the components are all endogenous with common determinants, it is difficult to measure the effect of an exogenous shift in the fiscal balance with any degree of precision. [13]

Slightly less than half of government spending (45 percent) is undertaken by state and local governments, and about 20 percent of their revenues are in the form of federal transfers. They are constrained to maintain relatively balanced budgets by constitutional requirements and fears of migration to other tax jurisdictions. In the aggregate, their fiscal deficits have averaged less than 0.5 percent of national income, although their combined deficit was slightly above one percent in 2009. Thus, nearly all discussions of the U.S. fiscal policy focus on the federal government budget.

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[13] Some recent empirical efforts to measure the net relationship between the two components suggest that 30-40 percent of a change in the fiscal balance will be reflected in the current account (Bartolini and Lahiri, 2006). The remainder is absorbed by offsetting changes in the private saving-investment balance.

Some researchers have interpreted the finding of a limited link between the fiscal and external balance to imply that deficit reduction cannot play a critical role in reducing the external imbalance. Perhaps that was true a few years ago when the projected fiscal deficit was a relatively modest percent of GDP. However, as shown in figure 5, the financial crisis and the measures taken to reverse it have dramatically altered the fiscal outlook of the United States. The federal deficit was 10 percent of GDP in FY2009, and is projected at a similar level in 2010. Those deficits are sufficient to turn the net national saving rate negative for 2009 and 2010. As shown in the figure, they also represent an enormous shift in the budget outlook compared to the projections that accompanied the FY2008 budget. The baseline projections of the Congressional Budget Office (CBO) assume that all of the stimulus measures are allowed to expire and that the tax reductions of the Bush Administration are reversed. They are a best-case scenario; yet, the projected deficits still remain above 3 percent of GDP in future years. The Obama administration has proposed an alternative in which the deficit is 11 percent of GDP in fiscal year 2010 and declines to 4 percent over the next five years.[14] Even with the CBO baseline assumption, the public debt will rise to 65 percent of GDP in the next three years–double the level expected in the 2008 budget–and slowly rise thereafter. Under the alternative projection of the Administration, the debt will be about 77 percent of GDP at the end of the 10-year projection period.

A perspective that highlights the conflict between a rising share of GDP being devoted to federal government expenditures and a stable or falling revenue share is provided in figure 6. For several decades, federal expenditures were a constant share of GDP as declining defence spending offset steadily rising outlays on medical and income transfers to the elderly. That pattern has been interrupted by the rising cost of wars in the Middle East. In future years the total will rise at an accelerating rate due to increased costs for a retiring baby-boom generation and interest on the public debt. Meanwhile, government revenues remain at or below their historical share of GDP due to tax reductions that were enacted as part of the 2009 fiscal stimulus.

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[14] The alternative assumes that the Congress will extend the bulk of the Bush Administration tax cuts and adjust the alternative minimum tax (AMT) for inflation. The Congress has also acted every year to prevent the implementation of a law reducing Medicare reimbursements.

There is, however, no political support at the current time for either a scaling back of programs for the aged or tax increases. The Obama administration has committed to a PAYGO rule of paying for new future programs with offsetting budget actions, but they have exempted many of the items in the above budget projections. And in the short run, reductions in the budget deficit conflict with an urgent need to reduce unemployment.

Why Is the U.S. Trade Deficit So Persistent?

We have already documented the persistently large US external deficits over the past quarter century and in particular over the period from the early 1990s through the mid-2000s in which the deficit increased steadily to over 6% of GDP. We have also argued that a gradual tapering of this deficit began in 2006 – associated with a substantial real depreciation of the US dollar (and expenditure switching) but with little evidence of the internal rebalancing (expenditure reductions) also required for a sustainable transition to lower imbalances. While the onset of the economic crisis, with its sharp dollar appreciation, arrested the fledgling 'soft-landing,' the collapse in world trade cut the US trade deficit in half 2009.

In this section we take a closer look at net exports, the main component of the current account. After briefly describing the evolution of US exports and imports, we turn to a review of their determinants and the implications for what might be required for a sustained rebalancing from this 'external' perspective. Also of interest is recent work examining experiences with current account reversals and with recovery from crises in advanced economies that may be quite relevant for the US.

Figure 7 shows the evolution of exports and (total as well as nonoil) imports as a percentage of GDP since 1980. While the US did become somewhat more open during this quarter century, it is notable that most of this increase is associated with import growth in the second half of the period. In 2005, exports were about the same share of output as they had been in 1980. The figure also shows the two episodes of large imbalances. In the mid 1980s, the trade deficit was primarily due to a deterioration in exports generated by the expansive fiscal policy of the Reagan years, high interest rates, and a sharp appreciation of the U.S. exchange rate. In the more prolonged second episode, the issues have been steadily rising imports combined with weak export

performance. The figure also shows the faster growth in exports over imports narrowing the deficit in 2006-7, as well as the more recent sharp drop in exports and the even more pronounced fall in imports.

Determinants of the U.S. External Balance. A large empirical literature studies the determinants of US imports and exports, typically estimating the sensitivity of exports and imports to changes in (lagged) relative prices and incomes. During the past decade, there has been a focus on examining what it would take to achieve a sustained reversal of the US current account deficits. However, there has been considerable variation in time period, specification and measurement of key variables resulting in a wide range of estimates.

Until relatively recently, the empirical results tended to support what became known as 'elasticity pessimism' for two reasons.[15] First, US imports were found to be quite insensitive to changes in relative prices. While exports seemed to be somewhat more price elastic, studies often found the overall price elasticities low enough that a depreciation of the dollar would only be associated with trade balance improvement because of the relatively low pass-through of nominal exchange rates into import prices. Conventional wisdom suggested that to accomplish a one percentage point of GDP decline in the US external deficit would require a relatively large real depreciation of the dollar -- by as much as 10 to 20 percent.

Second, the estimates tended to support a finding by Houthakker and Magee (1969), that US imports are considerably more sensitive to increases in US income than are US exports to increases in the income of US trading partners. Thus, balanced growth in the US and its trading partners would be associated with a deteriorating US external balance.

More recent work benefits from improvements in specification and inclusion of data since 2000. In particular, researchers have explored issues related to vertical

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[15] Examples include Hooper, Johnson and Marquez (2000) and Chinn (2004). Unlike the earliest studies, these authors incorporate the more recent estimation techniques that allow for feedback among key variables and address nonstationarity in the trade data. IMF (2007) provides a summary of the relevant literature, as well as new estimates of the relevant elasticities and an interesting review of 42 episodes since 1960 in which advanced countries achieved reversals of large, sustained external deficits.

integration and trade in intermediates, as well as aggregation bias and the possibility that shifts in the composition of trade away from goods and towards services may have increased price and income responsiveness. While there is no clear consensus on the magnitude of the relevant elasticities, studies that use the same methodology to compare the past decade with prior periods tend to find that both exports and imports have indeed become more responsive to changes in both incomes and relative prices, and furthermore, that the Houthakker-Magee asymmetry in income elasticities has disappeared. Thus, a one percentage point reduction in the aggregate trade deficit may now be associated with a smaller real dollar depreciation, perhaps in the range of 8 to 15 percent, and balanced growth need not imply trade balance deterioration.[16]

In table 4, we provide some empirical estimates of U.S. trade elasticities that illustrate the issues discussed above. The first panel reports a simple logarithm regression that relates the real value of U.S. exports to global GDP, a 4-year average of the real exchange rate, and a time trend. We also distinguish between exports of goods and services. In the middle panel we report similar equations for imports, but use U.S. real GDP as the activity variable. The third panel focuses on the net trade balance, but because it is frequently negative, we measure the balance as the logarithm of the ratio of exports to imports. If trade is balanced, the ratio is unity. This specification constrains the coefficients on the two activity variables to be equal.[17]

We highlight three features of the regression results. First, we too find that the Houthakker-Magee asymmetry has disappeared, with the income elasticities of exports and imports both estimated to be about two. Since the U.S. and the world economies grew at roughly equal rates over the past two decades while the world economy grew significantly faster than the U.S. since 2000, income effects cannot account for the deterioration in the U.S. trade imbalance. Second, exports and imports have similar price elasticity magnitudes. Furthermore, their sum is well above one, implying that exchange rate depreciation will have a net positive effect on the trade balance.

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[16] See IMF (2007) and Crane, Crowley and Quayyum (2007).

[17] The trade data are from the U.S. national accounts. The contribution of the real exchange rate is maximized with a four-year lag, but we found no significant role for a lag of the activity variable.

Third, we find a significant negative trend in the equation for the total trade balance. As shown, this negative trend reflects a secular decline in exports relative to imports of goods. In contrast, the trend is positive for services trade – which accounts for a relatively small share of the total. We tested the hypothesis of a one-time shift in the constant term -- as shown in figure 3- for a range of possible 'shift dates'. However, the gradual trend deterioration we report here was clearly preferred to a shift. We note that the trend is larger in the export than the import equations, but not statistically significant. The finding of a gradual deterioration in U.S. exports relative to imports, when controlling for relative prices and incomes, is quite provocative. We discuss some aspects of the issue in following section, but a full exploration of the factors underlying this result is an interesting area for future work.

Can U.S. Exports Compete? Martin Baily and Robert Lawrence (2006) identify weak US export performance as the primary explanation for the secular decline in the trade balance. Similarly, our previous work argued that the United States underperforms as an exporter of goods relative to a peer group of high-income European countries and Japan. [18] Our analysis was based on a standard 'gravity equation' formulation that relates bilateral import and export flows to economic size, distance and other measures believed to be associated with degree of 'trade resistance' such as common language and existence of colonial ties. We pooled the data for the bilateral trade for each of three regions (the original 15 members of the European Union, Japan, and the United Sates) with 162 other countries for the period of 1980 to 2005. We also included the real exchange rate for each of the three regions as a measure of relative price competitiveness. Those regressions are reproduced in table 5. A 'dummy variable' for the United States in the combined export equation is consistently negative and significant. In contrast, we find no evidence that the United States performs differently than Japan or than the EU in terms of imports.

Why has US export performance been so weak? This does not appear to be attributable to either a lack of growth in U.S. export markets or to the commodity composition of trade. A partial explanation may relate to the willingness of American

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[18] Bosworth and Collins (2008).

multinational firms to use the local production of foreign affiliates as an alternative to exporting. U.S. affiliates of foreign parents purchased 16.4 percent of their sales abroad in 2007, as reflected in U.S. imports for goods and services. In contrast, foreign affiliates of U.S. parents purchased just 6.2 percent of their total sales directly from the U.S. If this share were increased to 16.4 percent, U.S. exports would rise by more than $600 billion, or more than 1/3 of their 2007 value. [19]

Second, foreign observers often point to U.S. government restrictions on high technology exports, but the magnitude of potential trade covered by those measures is relatively small. While this is an area that would benefit from additional analysis, it is important not to exaggerate the concerns with export performance. Baily and Lawrence (2006) stress that only a quarter of the increased deficit between 1991 and 2005 can be attributed to the shift they uncover, with fully three quarters associated with the much stronger value of the US dollar.

Impact of the Crisis. While trade flows typically fall during global downturns, the drop during the current crisis has been considerably more severe than historical evidence would have predicted. In partial explanation, Caroline Freund (2009) presents evidence that the sensitivity of world trade to global GDP has increased every decade since the 1960s, and that the cumulated rise in this income elasticity is large and significant. Furthermore, the sensitivity tends to rise in the midst of a recession. She also finds banking crises to be associated with somewhat larger import declines, supporting the hypothesis that the financial crisis may be partially to blame for the speed and extent of trade collapse. Other hypotheses have been advanced to explain the magnitude of the recent collapse in trade. One focuses on the implications of increased specialization in the global supply chain. Another notes that goods production tends to fall more sharply than services production during a downturn. Goods are a larger share of trade than of GDP, and the share of services in global output has been growing. While each of these factors seems likely to have played a role, it is too soon for a full analysis that might suggest their relative importance.

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[19] These data come from Lowe (2010). However, in our earlier work, we found little difference between U.S. and Japanese affiliates activities in China. Thus, we remain uncertain about the full implications of U.S. affiliates' behavior.

Unlike unemployment, trade flows tend to rebound relatively quickly as output growth recovers in the aftermath of a crisis.[20] Indeed, Freund (2009) finds that most of the trade adjustment occurs in a year. Thus the moderation of large imbalances seen in the midst of the down-turn is typically short-lived. She also finds that, on average, there is no lasting rebalancing for either those countries in deficit or those in surplus pre-crisis. Cases in which the crisis triggered a significant change in investment or fiscal policy are offset by those in which the imbalance deteriorated further post-crisis. However she, like other researchers, cautions against drawing too close parallels between the current crisis and past episodes. The recent collapse was much more pervasive and severe, and it originated in the core, not in smaller more peripheral economies.[21]

Post-Crisis Outlook

The financial crisis has had a major impact on the United States economy. The unemployment rate has been driven above 10 percent compared to 4.6 percent in 2006-07. The collapse of the housing market has left millions of home owners with a negative equity position, and the market for corporate equities remains far below the pre-crisis level, creating severe problems for the private pension system. The financial system remains damaged and difficulties of obtaining credit are expected to slow the pace of economic recovery. As discussed above, the crisis and the government's response have also left the United States with a severely distorted saving-investment balance. While the external deficit shrunk to -3.5 percent in 2009, the government budget deficit has exploded to over 10 percent of national income, and the net national saving rate has turned highly negative. A smaller trade imbalance has only been possible because private investment has fallen to its lowest share of GDP since the depression of the 1930s.

Current expectations are for a weak recovery of the U.S. economy relative to historical norms. In figure 8, we show the paths of recovery as projected by the CBO and

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[20] Carmen Reinhart and Kenneth Rogoff (2008, 2009) and Caroline Freund (2009).

[21] Stephen Cecchetti, Marion Kohler and Christian Upper (2009) study 28 financial crises since the 1980s and argue that the current crisis is unique. They use the variation in their sample (not the averages) to draw inferences. Interestingly they find that external factors (growth in trading partners and number of concurrent crises) do not affect the duration or depth of the crisis-related down-turn.

the Administration in their January 2010 economic reports and contrast them with the average recovery from the eight prior U.S. business cycles. The initial few quarters may incorporate sharp cyclical gains in inventory investment, but overall investment is likely to be relatively weak for several years due to excess capacity in residential and commercial real estate. The Administration projects growth at 3 percent in 2010 and 4.3 for 2011. The CBO is more pessimistic, projecting GDP growth of only 2.1 percent for 2010 and 2.4 percent in 2011. The IMF report projects a similar weak recovery, but it recent projections have been rised upward. In any case, these growth rates are far below the pace of recovery from prior recessions.

The sluggishness of the projected recovery arises from four sources: The first is the continuing and only gradually weakening effects of the financial crisis. Banks and other financial institutions, while no longer under threat of financial crisis, have much deleveraging still to accomplish–partly to absorb additional large losses and partly to satisfy their own heightened risk aversion. The consequence could very well be failure of private credit availability to expand sufficiently to sustain vigorous recovery. The second potential source of sluggishness is a weak recovery of investment due to the large excess supply in residential and commercial real estate. The third is an anticipated drag on consumption expansion from the huge losses in net worth suffered by households in recent years. And the fourth is a period of several years when budget policy will be tightening, as the fiscal stimulus is phased out.

At the same time, the United States must prevent a return to the high-consumption, low-saving pattern of the pre-crisis era. Projections of weak income growth and a depreciated exchange rate are consistent with the current account remaining at a reduced level of about 3-4 percent of GDP; but in the short run, it is likely to be an external balance matched by low or even negative rates of national saving and continued low rates of domestic investment. This scenario is far from the soft landing that seemed achievable in mid-2008.

Fiscal Stimulus Scenarios: The slow pace of the U.S. recovery has already generated pressures for additional fiscal stimulus. However, the imbalances that existed

prior to the onset of the crisis– as reflected in both the fiscal and external deficits–restrict the policy response to the crisis. Many observers have already expressed concern about the ability to finance those deficits in future years. Model simulations provide valuable structure for looking more closely at possible implications of incremental fiscal stimulus. In this section, we consider simulations using the University of Michigan's quarterly macro-economic model of the Research Seminar in Quantitative Economics (RSQE) to illustrate the short versus long run policy conflicts. This model is similar to others used to forecast future economic developments and to simulate the effects of policy options.

Table 6 reports the effects of two fiscal policy actions. The first is a permanent increase in the constant-dollar value of government purchases. The second assumes that the stimulus takes the form of an equal constant-dollar reduction in personal taxes.[22] In order to maximize their impact, we have also assumed that monetary policy accommodates the fiscal stimulus by maintaining a fixed level of nominal interest rates. Thus, there is no monetary offset or fiscal crowding out. Both simulations are reported over a 5-year horizon. The simple multipliers for the per dollar effect on real GDP are reported in the first column. As shown, the multiplier on expenditure is particularly large, peaking in the 2nd year with a value of 2.5 due to strong effects on private investment and gradually trailing off thereafter. The multiplier for a change in taxes/transfers is significantly smaller, due to the partial and lagged response of consumption to the initial increase in disposable income. It peaks in the third year at 1.3. The effect on unemployment is correspondingly much larger for the purchases simulation than for the tax reduction. The change in the nominal measure of national income reflects both the increase in real output and its effect on inflation and the price level.

Our primary interest, however, is the how much the government budget balance changes and the means by which the change is financed. A portion of any government outlay is recovered due to the feedback effects of higher GDP on tax revenues and transfer payments. Thus in the first year, a $75 billion increase in government purchases

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[22] The actual simulation assumed an increase in transfers to persons because it was easier to implement in the model. The simulations reflect sustained changes of $100 billion (2005 prices) per year beginning in the fourth quarter of 1998. In nominal terms, the initial expenditure stimulus was $73 billion, and the tax reduction was -$82 billion.

results in a budget deficit increase of $51 billion. This recovery rate of about one-third rises over time to about 50 percent. A large portion of the budget deficit is initially financed by an offsetting increase in private saving. However, the private saving-investment balance also turns negative as private consumption responds to the higher income, and as private investment rises in response to the growth of GDP. Thus, the fiscal stimulus has a large and growing impact on the trade deficit through increased imports that peaks in the third year of the simulation. Because the U.S. fiscal action is assumed not to be co-coordinated with its trading partners, there is no equivalent rise in foreign incomes and the change in U.S. exports is small.[23]

The impact of the tax reduction is substantially smaller than that of the expenditure stimulus. This is because the early effect is largely limited to a transfer of funds between the government and households, and at least initially households save a large portion of the increment to their income. Without the expansion of tax revenues, there is a larger decline in the government budget, but much of it is offset by the increase in private saving. Again, the current account deteriorates, but by a smaller amount in line with the smaller change in GDP.

The most striking aspect of the simulation is the large portion of the budget deficit that must be financed abroad. We conclude that additional fiscal stimulus (unaccompanied by any comparable fiscal actions by U.S. trading partners) would speed the recovery from the recession and promote job growth; but at the cost of an even larger budget deficit, a large deterioration in the trade deficit and increased reliance on foreign financing. The result is financially unsustainable, and no simple means of correcting the future imbalances is evident.

The United States has suffered a major loss of domestic demand–in both consumption and investment–the severity of which is being camouflaged by an unsustainable magnitude of government deficit spending. The consumption binge of the past two decades is likely to be over, and the retrenchment of domestic demand requires a return to a much more balanced external position, with near equality of exports and

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[23] In the RSQE model, the nominal exchange rate depreciates, both to offset the higher domestic price level–effectively maintaining PPP–and in response to the larger current account deficit. As a result, there is very little net change in the real exchange rate.

imports. In the long term, the United States could achieve a rebalancing of the economy if it were able to increase domestic saving. Consumer spending more in line with income and a smaller budget deficit would translate into a increase in the domestic S-I balance (which is now highly negative), a real exchange depreciation and a shift of the resources into the tradable goods sector–a smaller trade deficit. The challenge is how to get there. A contraction of domestic consumption combined with a reduced budget deficit is likely to worsen the current recession. A recovery based on further fiscal stimulus (and the associated large internal and external deficits) simply postpones the adjustment. In fact, the demand shortfall may be too large to be offset by any feasible fiscal stimulus. Thus, U.S. policy makers confront the extremely difficult task of balancing short and long-run policy objectives.

Tools to Achieve Rebalance? While it seems obvious that restructuring the economy will require a much greater emphasis on the tradable goods industries, the available tools are limited. A sustainable economic recovery will require shifting the composition of GDP, consistent with maintaining the share of net exports at 3 percent of GDP or below. However, how to achieve this in the near term is not evident. In a fully employed economy, the standard approach would be shifting the mix of fiscal-monetary policy: a more restrictive fiscal policy aimed at raising domestic saving, offset by monetary policy easing to maintain total demand and encourage exchange rate depreciation. However, interest rates are already at historical lows leaving little room to provide stimulus by conventional means. Furthermore, some countries have met the recent dollar depreciation with offsetting actions - ranging from direct intervention in exchange markets to capital controls - all aimed at preventing the realignment of trade flows.[24] Finally, direct restrictions on imports and promotion of exports are severely circumscribed by past treaties, with particularly (and deservedly) bad reputations for tariffs and quotas since politicians cannot avoid applying them in selective and

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[24] Recent examples are new restrictions on inflows that have been introduced by Brazil and Taiwan, and Thailand has relaxed restrictions on capital outflows. Given the required equivalence of the capital and current account, it is striking that trade restrictions are universally condemned while proposals for capital controls are often embraced.

distortionary ways. What is left? In the remainder of this section, we comment briefly on some remaining possibilities.

The external balance has been a key economic policy target for many countries, but has not generally been a focus of U.S. policy.[25] However, President Obama announced a new National Export Initiative (NEI) in his January 27, 2010 State of the Union Address to Congress, setting the goal of doubling exports in the next five years. The Administration recognizes the importance of stronger export performance – though it is notable that this initiative is explicitly motivated as a means of job creation, not external balance or sustainability. Exports, like private saving, are difficult to influence through available policy instruments, especially in the short run.[26]

The Administration currently lacks authority to negotiate trade agreements and it seems unlikely that new authority will be granted by Congress anytime soon. There is little reason to believe that completing the Doha round of global trade negotiations would have a significant positive effect on the U.S. trade balance (Hufbauer and others, 2010, Box 2).[27] At the same time, barriers into the markets of many U.S. trading partners are higher than barriers into the U.S market. Other countries are actively negotiating bilateral and regional trade agreements. U.S. exclusion may compound market access challenges for U.S. producers. There are also good reasons for concern that U.S. corporate tax structure may reduce the competitiveness of U.S. businesses, with implications for location decisions and export performance. A recent study by the U.S. Treasury concluded that, although U.S. corporate tax rates were relatively low in the

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[25] U.S. trade negotiators have not previously focused on export promotion beyond agriculture. While other countries have used tax incentives, financing and marketing assistance as export-promotion policies, the United States has eschewed the use of industrial policies recognizing that they are distortionary and unlikely to be effective within the U.S. political system. For further discussion, see Schultze (1983) and Destler (2005). The politics surrounding U.S. trade policy have also been strongly affected by the end of the Cold War, removing a major determinant of U.S. trade policy.

[26] The main components of the NEI announced to date include creation of an export promotion cabinet, with a private sector advisory group, additional trade finance through the Export-Import Bank (some targeted to small and medium sized businesses), efforts to assist US businesses identify new markets abroad, and reforms to the US export control system (to reduce processing time and harmonize standards).

[27] However completion of the Doha Round would have other positive benefits for the global trading system.

1980s, it had the second highest statutory tax rate among OECD countries in 2006 due to significant tax reforms abroad (Office of Tax Policy, 2007). Specifically, the U.S rate was 39 percent including state corporate taxes, compared with an OECD average of just 31 percent – and a number of other advanced countries are continuing to reduce their tax rates. Relatively high business taxes discourage investment by raising the cost of capital. The report also highlights concerns related to the distortionary impact of the unevenness of U.S. taxation across industries, sectors and financing methods. This work strongly suggests that it is time for a comprehensive reform of the U.S. corporate tax system, expanding the base while lowering rates and that recognizes the major shifts in the global landscape.

Perhaps it is also time for the United States to consider following other countries in the use of capital controls intended to force limits on the current account imbalance.[28] In contrast to its earlier advocacy of unfettered capital flows, the IMF recently advanced a more favorable view of capital controls as a legitimate element in a country's policy toolkit to help limit exchange rate appreciation and reduce the volume of capital inflows (Ostry et. al, 2010). In terms of effectiveness, they conclude that the jury is still out and that the evidence does not point clearly to a preferred type of control and that the efficacy of capital controls is likely to diminish over time. They stress the need to consider multilateral implications of such measures and that such policies do not substitute for traditional macroeconomic policies and prudential regulation. But their conclusion is that such controls may be valuable as complements or in situations when traditional means are circumscribed – arguably applicable to the current U.S. situation in which capital inflows sustain an undesirably large current account imbalance. While their analysis is based on a comprehensive review as well as new work on the effects of different types of controls, it focuses on emerging market economies (not the central reserve currency's economy). Capital controls are clearly far from a silver bullet, but they may warrant further attention given the paucity of alternative policy options.

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[28] As a member of the OECD, the United States adheres to the codes of liberalization of capital movements, which generally prohibit the introduction of new restrictions on capital flows.

Much of the recent domestic discussion has focused on China's exchange rate and a belief that a Chinese exchange rate revaluation would solve U.S. export problems. However, the United States and China produce quite different ranges of products. China is a low-wage producer with a major role in an Asian production network as an assembler of products for transshipment to the U.S. In contrast, the U.S. is a high-wage capital goods producer whose competitors are largely in Japan and the EU. The benefits of an appreciation of the RMB would accrue mainly to other low-wage countries that compete with China. It would benefit the United States by spreading the adjustment to a depreciated dollar more broadly – reassuring countries that do allow their currencies to appreciate against the dollar that they will not suffer a competitive loss to China. It is true that China's policy of maintaining a large trade surplus at a time of weak global demand damages the global economy as a whole, but the associated costs are not borne primarily by the United States. A focus on China does not obviate the need for the United States to address its own problems.

The absence of a clear path for the United States to escape the recession and emerge with a balanced economy is a cause for great concern. Without a stronger external account, any recovery is likely to be incomplete. As the focus of public attention on the trade imbalance increases, the pressures for destructive trade actions will grow, and with them the potential for trade conflicts. We are led to conclude that the exchange rate is the most important determinant for achieving adjustment of the U.S. trade balance. The current level of the real exchange rates (perhaps with some further decline) should be consistent with a gradual future reduction in the size of the external deficit. The challenge will be to prevent a real appreciation.

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Figure 1. Stock and Flow Measures of the U.S. External Balance, 1980-2009
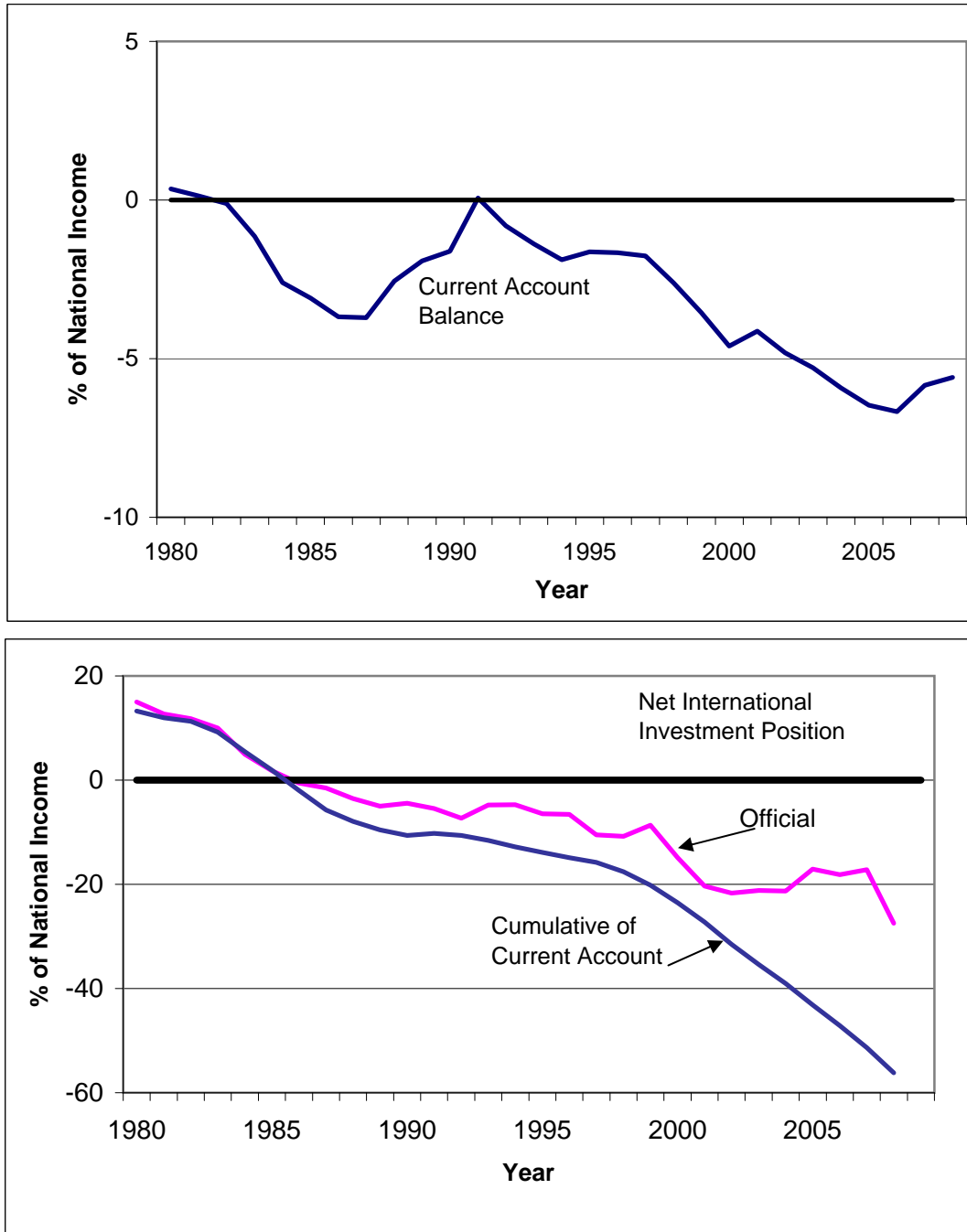
Source: the U.S. Bureau of Economic Analysis and authors' estimates

Table 1. Current Account as a Share of World GDP, Selected Regions and Years

Percent

Region	1980-89	1990-99	2000-05	2006-08	2009
U.S.	-0.50	-0.43	-1.41	-1.37	-0.65
Japan	0.26	0.36	0.35	0.33	0.17
Europe[1]	-0.01	0.09	0.23	0.15	-0.02
Emerging Asia[2]	-0.01	0.06	0.38	0.86	0.86
Emerging Latin America[3]	-0.11	-0.14	-0.02	0.04	-0.03
Middle East[4]	0.12	-0.04	0.21	0.51	0.11
Other countries	-0.31	-0.21	0.00	-0.11	-0.24
Discrepancy	0.54	0.30	0.27	-0.41	-0.20

Source: IMF World Economic Outlook, October 2009

1. Austria, Belgium, Switzerland, Germany, Denmark, Spain, Finland, France, Great Britain, Greece, Ireland, Italy, Netherlands, Norway, Portugal and Sweden.

2. China, Hong Kong, India, Indonesia, Malaysia, Phillipines, Singapore, South Korea, Taiwan, Thailand. First column average for 1982-1989.

3. Argentina, Brazil, Chile, Columbia, Ecuador, Mexico, Peru, Venezuela.
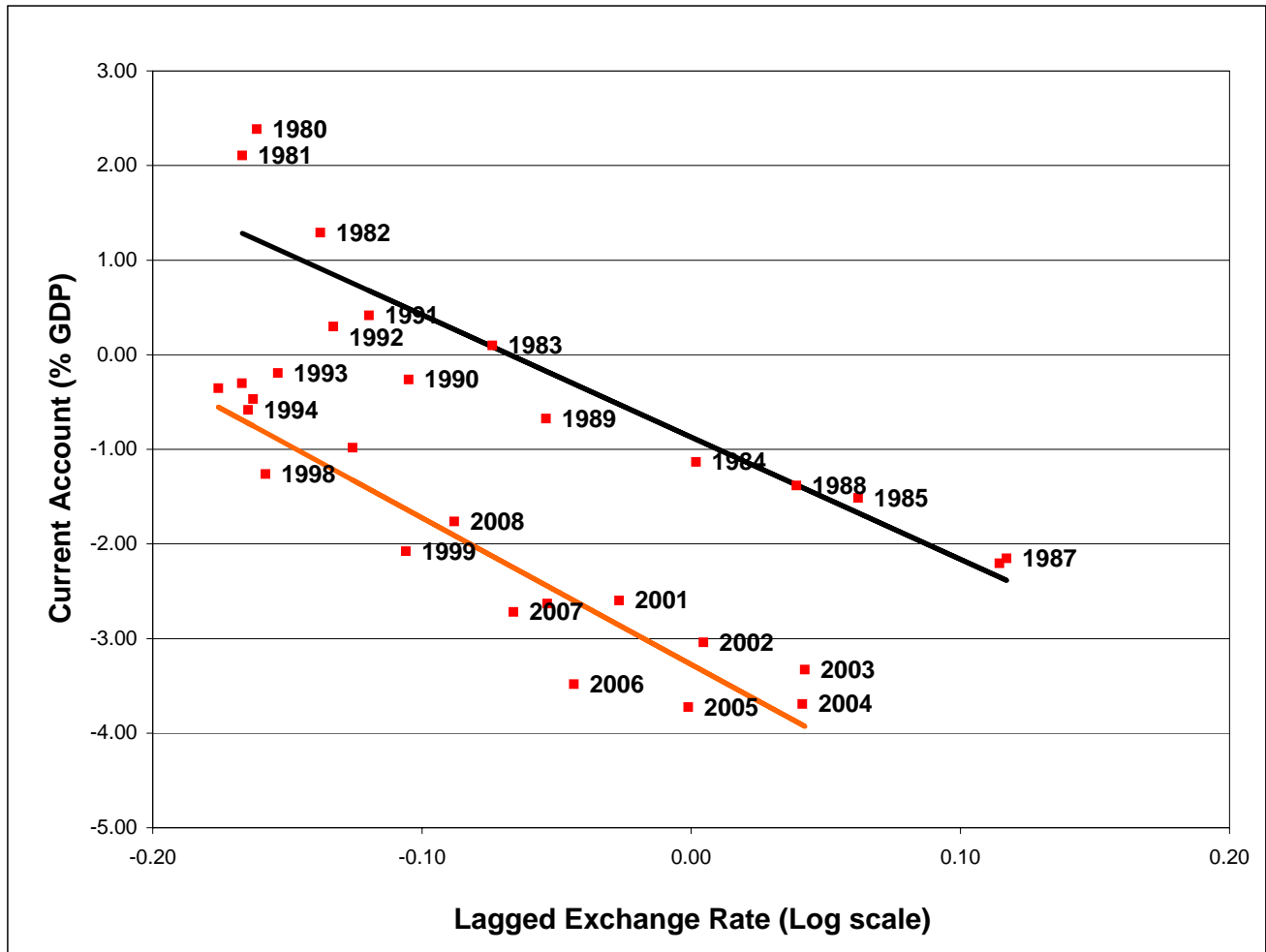
4. Bahrain, Egypt, Iran, Jordan, Kuwait, Lebanon, Libya, Oman, Qatar, Saudi Arabia, Syria, UAE, Yemen.

Figure 2. Alternative Measures of the Real Exchange Rate, 1975-2009
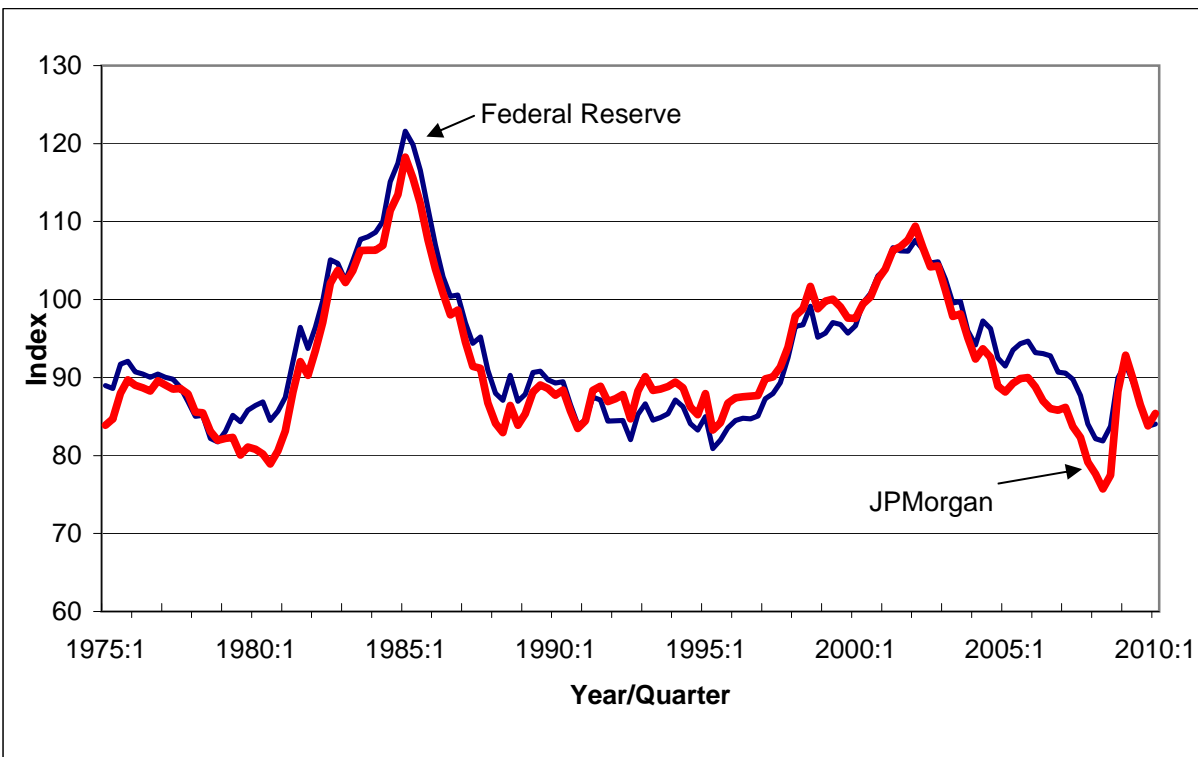
Source: JPMorgan and the Board of Governors of the Federal Reserve

Figure 3. Correlation of the Non-oil Trade Balance and the Real Exchange Rate, 1980-2009

Source: Bureau of Economic Analysis, Board of Governors of the Federal Reserve and authors' calculations.

Table 2. Composition of U.S. Aggregate Demand, 1980-2009
percentage of total

	1980-84	1985-89	1990-94	1995-99	2000-04	2005-07	2008	2009
Consumption	80.4	82.2	83.1	82.0	84.8	85.4	86.7	87.7
Private	63.4	65.2	66.7	67.3	69.6	69.7	70.1	70.8
Government	17.0	16.9	16.4	14.7	15.2	15.7	16.5	17.0
Investment	20.7	20.3	17.8	19.6	19.5	20.1	18.2	15.0
Private	17.2	16.6	14.3	16.5	16.3	16.9	14.8	11.4
Government	3.5	3.8	3.4	3.1	3.2	3.2	3.4	3.6
Net Exports	-1.1	-2.5	-0.9	-1.7	-4.2	-5.5	-4.9	-2.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Bureau of Economic Analysis, *National Income and Product Accounts*, and authors' calculations.

Table 3. United States Net Saving and Investment by Sector, 1960-2009

Percent of national income

Sector	1960-79	1980-89	1990-99	2000-07	2008	2009
Saving	10.9	6.5	5.4	3.6	-0.2	-2.9
Private	10.9	10.0	6.9	5.3	5.3	7.2
Household	7.0	7.2	4.6	2.2	2.3	3.8
Corporate	3.9	2.9	2.3	3.1	3.0	3.4
Government	0.0	-3.6	-2.4	-1.7	-5.4	-10.1
Domestic investment	11.1	9.4	7.9	8.4	6.2	2.3
Private	9.0	7.8	6.7	7.1	4.7	0.7
Government	2.1	1.6	1.2	1.3	1.5	1.5
Saving-Investment	-0.2	-2.9	-2.5	-4.8	-6.4	-5.2
Current account	0.4	-1.8	-1.7	-5.5	-5.6	-3.5
Statistical discrepancy	0.7	1.1	0.8	-0.7	0.8	1.7
Capital consumption	11.8	14.1	13.3	13.7	14.6	15.2

Source: Bureau of Economic Analysis, National Income and Product Accounts, and authors' calculations.

Notes: Net income, saving, and investment exclude capital consumption allowances. The statistical discrepancy is equal to investment plus the current account minus saving.

**Figure 4. Household Wealth as a Ratio to Income, 1970-2008**

ratio to disposable income
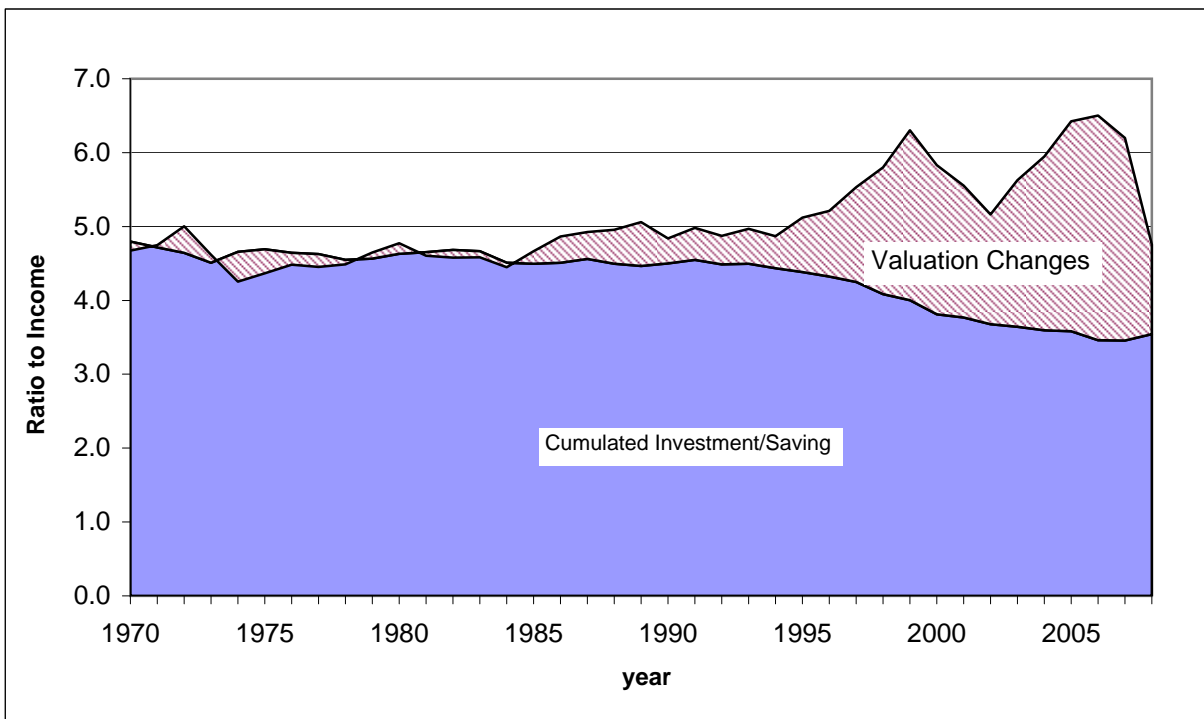
Source: Computed from tables B100 and R100 of the Flow of Funds Accounts. Net investment flows are converted to real values, cumulated, and converted back to nominal values. Wealth includes consumer durables.

Figure 5. The Federal Budget Balance and the Public Debt, 1960-2019.
percent of GDP

Federal Budget Surplus/Deficit

Debt Held by Public
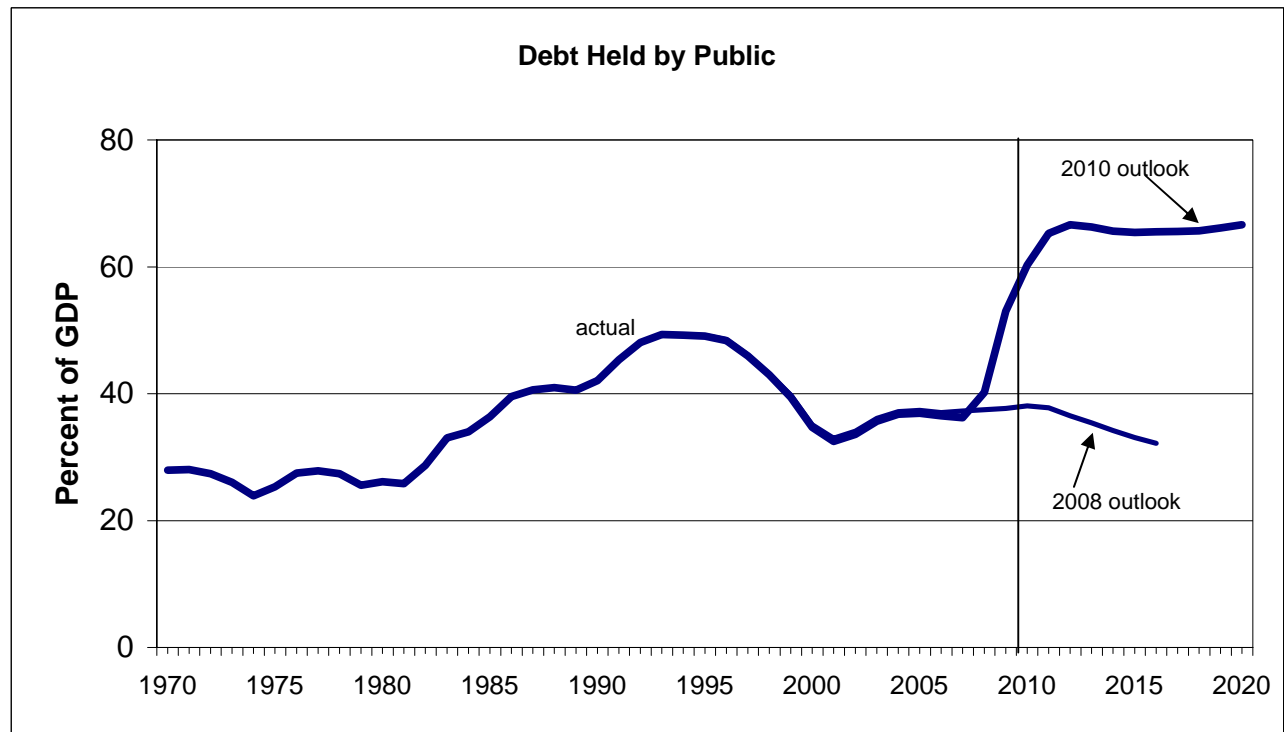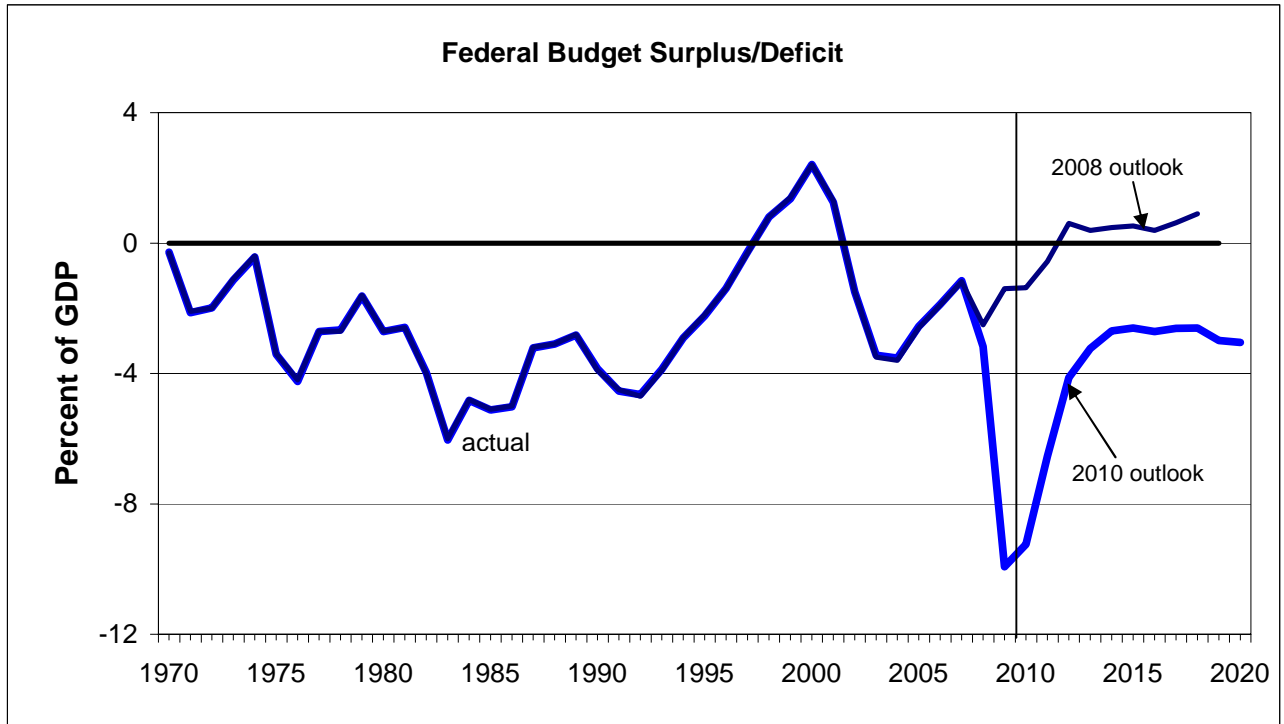
Source: Congressional Budget Office, Budget and Economic Update, August 2009 and August 2008.
Baseline Projections

Figure 6. Federal Revenues and Expenditures, 1980-2019
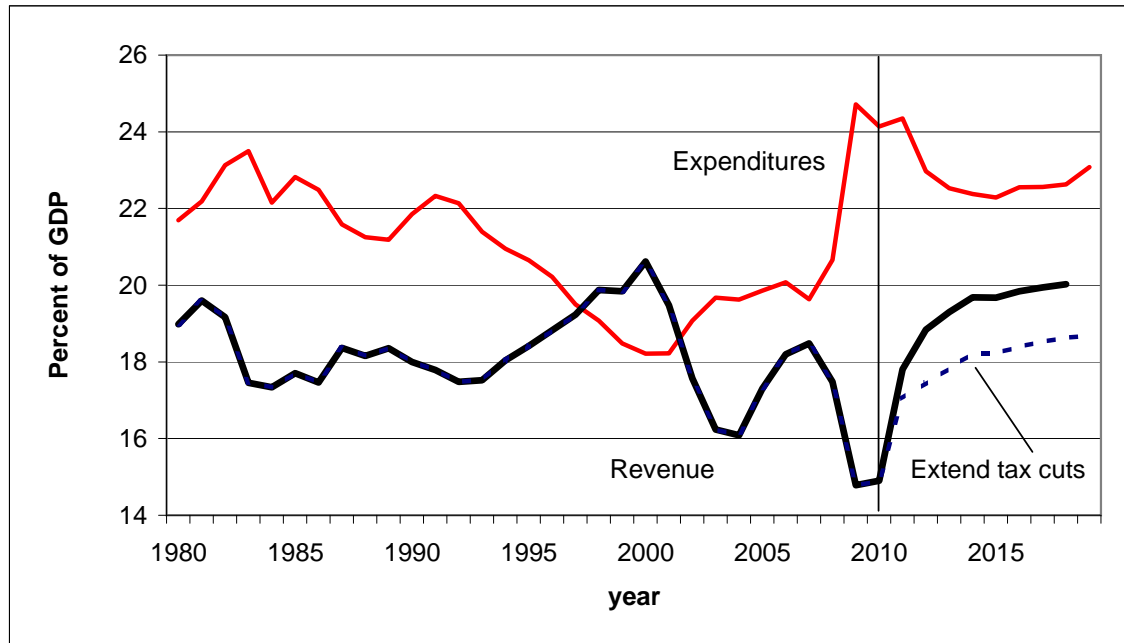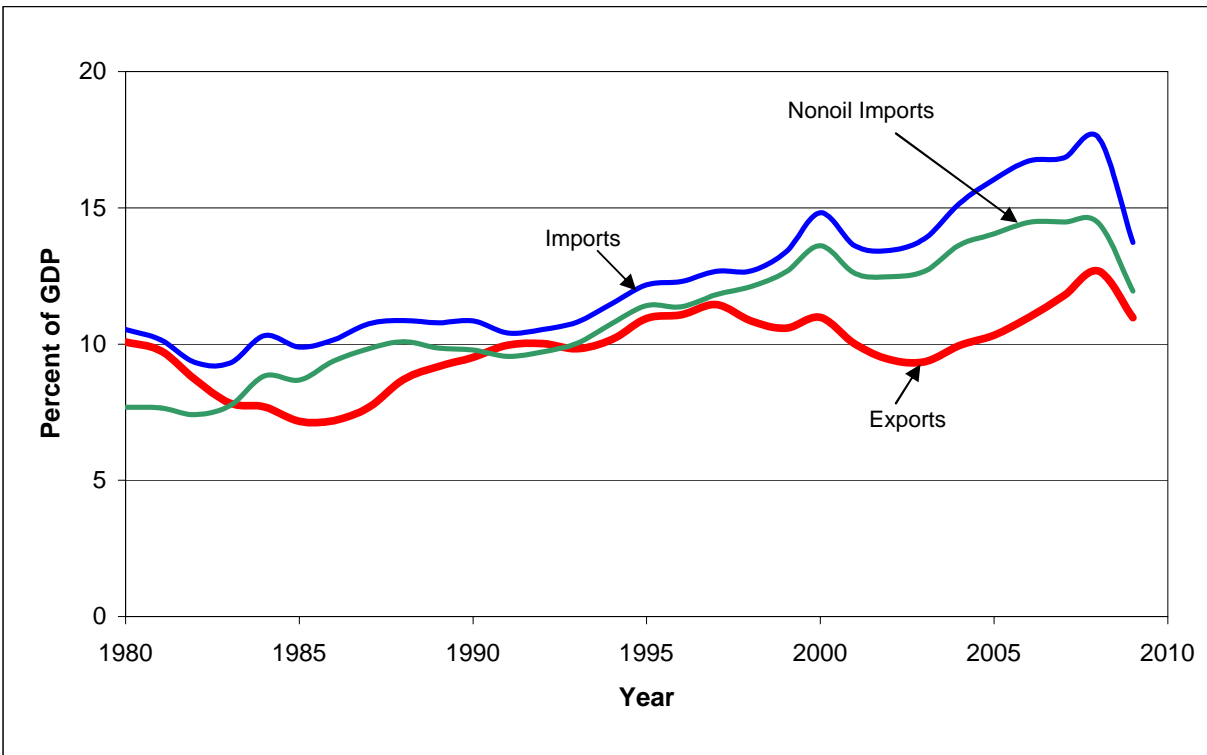percent of GDP

Figure 7. Exports and Imports, 1980-2009

Source: Bureau of Economic Statistics, National Income and Product Accounts.

Table 4. Regression Equations for Exports and Imports, 1976-2008

	Exports			Imports			Trade Balance		
	Total	Goods	Services	Total	Goods (less petrol)	Services	Total	Goods (less petrol)	Services
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Average FRB Exchange Rate	-0.69***	-0.76***	-0.57***	0.65**	0.73**	0.43*	-1.43***	-1.52***	-1.24***
	(0.15)	(0.19)	(0.16)	(0.19)	(0.26)	(0.17)	(0.20)	(0.29)	(0.14)
Time Trend	-0.022	-0.035	0.007	0.006	0.007	0.002	-0.016**	-0.026***	0.006***
	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.00)	(0.00)	(0.00)
Log(World GDP)	2.68***	3.17***	1.64**						
	(0.50)	(0.65)	(0.55)						
Log(US GDP)				2.35***	2.65***	1.59***			
				(0.40)	(0.54)	(0.38)			
Log(World GDP/US GDP)							2.00**	2.72**	0.22
							(0.59)	(0.86)	(0.52)
Constant	-17.02**	-21.81**	-8.81	-17.83***	-21.32***	-11.27**	4.70**	4.49*	5.46***
	(4.89)	(6.42)	(5.43)	(3.30)	(4.42)	(3.09)	(1.32)	(1.94)	(1.04)
Observations	33	33	33	33	33	33	33	33	33
Adj. R-squared	0.99	0.98	0.99	0.99	0.97	0.99	0.85	0.76	0.78
RootMSE	0.027	0.035	0.029	0.036	0.049	0.034	0.034	0.05	0.035
Rho	0.770	0.822	0.758	0.786	0.855	0.457	0.911	0.906	0.818

Notes and sources: Standard errors are in parentheses. *** p<0.001, ** p<0.01, * p<0.05. U.S. GDP, world GDP, exports, and imports are in real terms. Imports exclude petroleum. Average FRB Exchange Rate is the log of a 4-year average of the Federal Reserve Board's broad real exchange rate index. The regressions have been corrected for autocorrelation using the Prais-Winsten methodology and the autocorrelation transformation is indicated by the rho.

**Table 5. Combined Gravity Model for US, Japan, and EU-15**

	Exports / GDP (1)	Exports / GDP (2)	Exports / GDP (3)	Imports / GDP (4)	Imports / GDP (5)	Imports / GDP (6)
Weighted Distance	-1.102	-1.098	-1.123	-1.02	-1.02	-1.007
	(-61.2)	(-62.6)	(-63.4)	(-39.7)	(-39.7)	(-38.6)
Population	0.831	0.837	0.838	0.976	0.976	0.975
	(172.3)	(178.0)	(178.8)	(139.5)	(139.4)	(139.4)
GDP per Capita	0.973	0.974	0.972	1.062	1.062	1.063
	(153.1)	(157.4)	(157.5)	(116.6)	(116.6)	(116.6)
Common Language	0.258	0.529	0.544	0.562	0.562	0.554
	(10.9)	(20.7)	(21.3)	(16.7)	(15.0)	(14.7)
Colony	0.556	0.156	0.326	0.698	0.699	0.61
	(21.9)	(5.2)	(9.2)	(19.3)	(16.0)	(11.6)
East Asia Region	0.4	0.407	0.414	0.755	0.755	0.751
	(15.1)	(15.8)	(16.1)	(19.9)	(19.9)	(19.8)
United States		-0.586	-0.609		0	0.012
		(-24.2)	(-25.1)		(0.0)	(0.3)
Log Average Exchange Rate*			-1.119			0.586
			(-8.7)			(3.1)
Constant	-34.325	-34.249	-28.94	-38.49	-38.49	-41.276
	(-170.8)	(-175.1)	(-45.1)	(-133.9)	(-133.8)	(-43.6)
adj_R2	0.84	0.848	0.849	0.762	0.762	0.762
Observations	10570	10570	10570	10433	10433	10433

Source: Estimated by authors as described in text. All of the regressions are estimated within a fixed effects model allowing for shifts over years. All variables are measured as logarithms except for the categorical variables of common language, colony, the U.S., and the East Asia region.
*Computed as the trade-weighted real exchange rates of the United States, Japan, and the EU-15, averaged over the prior 5 years. Data provided by JPMorgan.

Figure 8. Projected levels of U.S. GDP, 2004-2011

Trillions of dollars
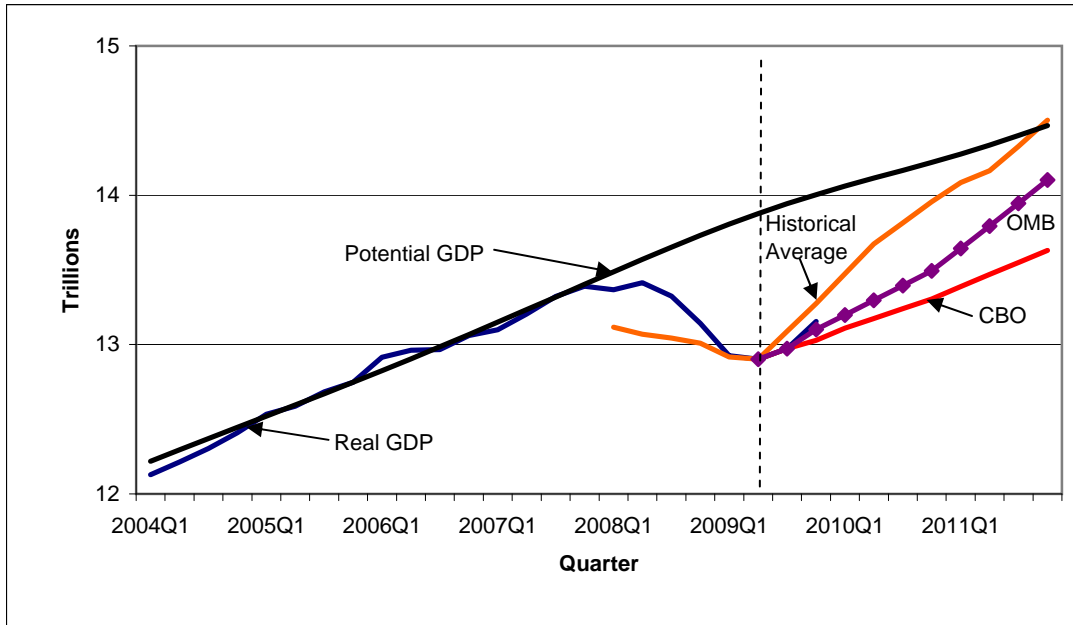
Source: Computed by the authors from the CBO and OMB 2010 economic reports.

Table 6. Simulation of Fiscal Stimulus and National Saving-Investment Balance

| Year | Multiplier | | National Income | Government S-I Balance | Private | | | Current Account |
	GDP (2005$)	Unemploy-ment Rate			S-I Balance	Net Saving	Net Investment	
				$100 billion (2005 $) Permanent Increase in Government Purchases				
1	1.53	-0.5	88.2	-51.4	30.0	82.4	52.4	-21.5
2	2.49	-1.1	175.8	-32.5	-22.1	100.1	122.2	-54.6
3	2.42	-1.1	232.5	-35.6	-36.2	78.0	114.1	-71.8
4	1.87	-0.7	271.2	-48.7	-13.1	53.3	66.4	-61.7
5	1.52	-0.5	306.2	-58.7	18.8	46.1	27.3	-39.9
				$100 billion (2005 $) Permanent Reduction in Personal Income Tax				
1	0.61	-0.2	34.7	-74.7	65.8	91.3	25.4	-8.9
2	1.17	-0.5	78.1	-68.6	45.1	103.1	58.0	-23.5
3	1.33	-0.6	107.9	-69.7	34.9	96.9	62.0	-34.9
4	1.21	-0.5	124.7	-75.7	41.7	85.6	43.9	-34.0
5	1.13	-0.4	136.5	-82.6	57.2	82.1	24.9	-25.4

Source: Constructed by the authors from policy simulations of the Research Seminar in Quantitative Economics at the University of Michigan. The two simulations incorporate permanent changes in government purchases and transfer payments in constant values.