Dollar Exchange Rate and the U.S. Current Account Adjustment:
Macroeocnomic and Industrial Impacts

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Introduction

In 1998, Inforum collaborated with the Manufacturers Alliance/MAPI to produce a study of the Asian economic crisis and its implications for the U.S. economy and industry.[1] The report concluded that "the Asian crisis will shift the current emphasis of (U.S.) economic growth from business investment, exports, and manufacturing to personal consumption, housing, and services." These words turned out to be prescient. Because the Asian economic crisis helped encourage a large and durable appreciation of the dollar, and, therefore, an increase in U.S. purchasing power, it proved to be an important component in stoking the subsequent boom in private consumption, housing, and financial asset prices.

At the same time, the Asian crisis was the first of a series of shocks that buffeted U.S.-based manufacturing over the subsequent five years. Most notably, the rapid U.S. export growth that characterized the early 1990s disappeared and domestic demand has become increasingly satisfied with imports. Indeed, anemic growth in the economies of major trading partners and the related strength of the dollar produced huge trade deficits that continue today, not withstanding domestic economic weakness from mid-2000 to mid-2003. Together with a severe contraction of equipment investment, these trade effects produced a deep and long-lasting contraction of U.S. manufacturing production and employment that is only beginning to be reversed.

As in 1997, the economy may now be facing another crossroads. As the domestic economy recovers strongly, the current account deficit continues to widen and now requires a foreign investment inflow averaging over $2.0 billion every business day. Most economists believe that any reversal of this trend will have to entail, among other possible changes, a large and widespread fall in the value of the dollar. Moreover, some experts worry that such adjustment might include a significant decrease in net capital inflows resulting in a rise in domestic interest rates that could undermine growth.

This study investigates some of the economic implications of currency and interest rate adjustments. It shows that the "expenditure switching" induced through a significant and widespread currency depreciation, by itself, would reduce the current account deficit only slowly. Unfortunately, domestic "expenditure reduction" brought about through reduced capital inflows and higher interest rates might do little to contribute to further deficit reduction because of an increase in net foreign factor payments. Moreover, such financial adjustments would take a large dent out of output, employment, and real income.

At the industry level, global rebalancing does result in enhanced competitiveness and increases the output of U.S. tradable goods sectors, especially manufacturing. Increased opportunities for such industries come at the expense of services and interest-sensitive sectors, such as housing. Therefore, over the next decade, we may see a reversal of U.S. sectoral fortunes compared to circumstances since the Asian economic crisis.

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[1] Margaret McCarthy and Jeffrey F. Werling, *The Asian Economic Crisis and the U.S. Economy: an Industry Perspective,* Manufacturers Alliance/MAPI, June 1998.

Will the current account deficit undermine U.S. economic recovery?

It is evident that the second quarter of 2004 will top off a year of vibrant economic recovery, in contrast to the recession and low growth of the previous three years. Inforum's current base forecast for the U.S. economy expects growth of 4.6 percent in 2004 and 3.5 percent in 2005, paced by continuing strong private consumption and a revival in both nonresidential business investment and exports. We also see steady and low inflation, a modest uptick in interest rates, healthy employment growth, and a widening current account deficit over the next two years. It is this final quantity that points to the major uncertainty surrounds not only Inforum's forecast, but all of the current conventional projections on the U.S. economy.

Figure 1 displays the annual current account balance in U.S. dollars for 1980 through 2003. Unlike in previous business cycles, the U.S. deficit fell only very slightly with the 2001 recession. Indeed, because of America's high propensity to import and subdued growth in major trading partners, much of the early fiscal and monetary policy stimulus leaked abroad, as evidenced by the widening of the exterior deficit as soon as demand increased in 2002.

In a recent study of current account reversals in industrial countries, Caroline Freund of the Federal Reserve Board found that "a typical current account reversal begins when the current account deficit is about 5 percent of GDP, that it is associated with slowing income growth and a significant real depreciation over a period of about three years."[2] In 2003, the U.S. current account deficit as a percent of GDP was 4.9 percent. In absolute terms it registered $542 billion, over $2 billion every business day.

There are several different mechanisms that might bring about a reduction of the external deficit to more sustainable levels. The best scenario would see a closing of the growth differentials among the United States and its main trading partners. Stronger growth in Europe and Japan would attract diversification-hungry investors, sloeing the high relative inflow of capital into the United States. This alteration of capital flows would stimulate a moderate and gradual depreciation of the dollar, moderately higher domestic interest rates, a higher personal savings rate (and thus lower domestic demand), enhanced export growth, and slower import growth. The entire adjustment process may take several years, and the current account deficit would not disappear completely. But the global economy would become much less dependent on the U.S. economy, and the U.S. economy would become much less dependent of foreign capital. This scenario would represent a so-called "soft-landing," where global supply and demand move into balance and the global economy emerges on more sustainable growth path.

A much less favorable outcome, or a "hard-landing," is also possible. Asian economies would remain excessively dependent on U.S. import growth, and governments there continue to accumulate large reserves in U.S. dollar assets, in order to dampen upward pressure on their currencies. But additional large increases in the U.S. external deficit could compel an abrupt and intense financial realignment that includes a significant exit of foreign investors from U.S. assets, a fall in the price of those assets, a sharp rise in U.S. interest rates, and a large depreciation of the

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[2] Caroline L. Freund, "Current Account Adjustment in Industrialized Countries," Board of Governors of the Federal Reserve Systems, International Finance Discussion Papers, Number 692, December 2000.

dollar. Such circumstances could imply a sharp fall in economic growth for the U.S., and indeed, the global economy.

Downward pressure on the dollar over the past three years is a sign adjustment may already be occurring. Figure 2 shows that since the beginning of 2002, the dollar has depreciated by 15 percent against the Canadian dollar (CAD), 25 percent against the euro (EUR), 21 percent against the pound (GBP), 17 percent against the yen (JPY), and 12 percent against the Korean won (KRW). But against the currency of key developing nations, adjustment has been much more muted. The graph shows no change versus the Chinese yuan (CNY) and a 25 appreciation versus the Mexican new peso (MXN). That doesn't mean that pressure does not exist, however. In order to maintain the Chinese yuan-dollar peg at its current rate, the Chinese government has had to accumulate over $200 billion in U.S. dollar denominated reserves. Moreover, several other developing Asian countries (as well as Japan) have resorted to similar intervention in order to keep their currencies more or less level with the yuan, and therefore, the dollar.

Assessing the U.S. Currency and Interest Rate Adjustments

A December 2003 Inforum study illustrates various macroeconomic and industry impacts of dollar depreciation by conducting two LIFT model simulations of a widespread fall of the dollar.[3] The first scenario assumes a widespread and substantial fall in the dollar compared to the baseline forecast. This simulation illustrates the "expenditure switching" that occurs through an adjustment of relative international prices (currency values) that make the U.S. economy, and especially its tradable sectors, more competitive. Throughout this paper, we refer to this alternative as **ESO** for **E**xpenditure **S**witching **O**nly scenario.

In addition to changing exchange rates in an identical manner to ESO, the second scenario boosts key interest rates by up to 150 basis points above and beyond the increase that might be expected from higher inflation. This exogenous shock simulates a sell off in dollar denominated bonds that might occur in conjunction with a broad-based depreciation of the dollar. In this second alternative, the expenditure switching resulting from exchange rates changes is accompanied by "expenditure reduction" that would occur if global rebalancing were accompanied by higher domestic interest rates. We refer to this scenario as **ES&R** for the **E**xpenditure **S**witching and **R**eduction scenario. The methodology of two successive alternatives allows us to decompose the macroeconomic and industry impacts that result from dollar depreciation from those that would occur from an exogenous interest rate shock.

Expenditure Switching Only (ESO)
The magnitude of the currency shock used for both scenarios (i.e., ESO and ES&R) is displayed in Table 1. The first line for each currency displays the percent difference from the baseline forecast for that currency. (Negative numbers signify a weaker dollar.) Focusing on this line, we see that compared to the baseline forecast for 2004 we hypothesize a dollar value 10 percent

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[3] LIFT, or **L**ong-term **I**nterindustry **F**orecasting **T**ool, is a 97-sector dynamic interindustry macroeconometric (DIM) model that combines interindustry (input-output) accounting with a structure consistent with the National Income and Product Accounts (NIPA). The LIFT model builds up from the industry level quantities to the macroeconomic level, so that the macroeconomic results are completely consistent and integrated with the industry detail.

less for the Canadian dollar (C$), the euro, the pound, and the yuan. Against the Japanese yen, the Korean won, and the Mexican peso, the dollar's value is weaker by 5 percent, 8 percent, and 2 percent respectively in 2004.

For 2005 and 2006, the dollar is further depreciated against the baseline values. For example, against the C$, the U.S. dollar is an additional 5 percent weaker in each of 2005 and 2006. Thus the Table shows a cumulative difference versus the baseline of 15 and 20 percent, respectively. These additional depreciations for each year are similar for the euro, the pound, and the yen, 2.0 against the peso, 4.0 percent for the Korean won, and 0.0 for the Chinese yuan. From 2007 onward, the exchange rates were held constant at the 2006 values.

Inforum's December 2003 base forecast already assumes a depreciation of the dollar against major currencies over the 2004 to 2006 period.[4] Therefore, the table contains a second line for each currency that shows for the alternative scenarios the cumulative depreciation from the dollar's (actual) 2003 value. These figures represent the total currency adjustment of the baseline plus the alternative. For instance, the base forecast assumes that versus the C$ the dollar would average 10 percent lower in 2004 compared to 2003. The ESO scenario adds another 10 fall from this baseline value. Therefore, in the ESO (and ES&R) alternatives, the U.S. dollar depreciates by 19 percent versus the C$ in 2004. For 2005 and 2006, the dollar is 27.3 percent and 35 percent, respectively, weaker than in 2003.

In order to compute foreign trade, the LIFT model of the U.S. economy is tied to similar models of major trading partners and the rest of the world through the Inforum Bilateral Trade Model (BTM).[5] In simple terms, LIFT sends the BTM its import demands and domestic prices for each of its traded commodities. U.S. commodity exports are determined within the BTM given the international commodity prices and imports demands of U.S. trading partners. Changes in exchange rates affect this solution by altering relative international prices, and in turn, the commodity import demands and the allocation of this demand among the commodity exports for each country.

To construct the alternative scenarios, the revised exchange rates represented in Table 1 were fed into BTM to simultaneously determine the changes in international demands and prices implied by the commodity trade functions for each component national and regional model. Since global competition restricts the ability of producers to pass all cost increases through to prices, we assumed that only 50 percent of these exchange rate changes are passed through into U.S. import

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[4] Specifically, for calendar year 2004 it projected a 10 percent depreciation of the dollar against the major currencies including of the euro, the Canadian dollar, and the Japanese yen, but no movements against the currencies of developing Asia, including the Chinese yuan. For 2005, it assumed another 10 percent fall against the major currencies and, finally, a 10 depreciation against the Chinese yuan and its regional partner currencies. For 2006, the base forecast expected the dollar to fall by another 5 percent against the major currencies and 10 percent against the Chinese yuan and its partners.

[5] The Inforum Bilateral Trade Model (BTM) forecasts bilateral trade flows and prices for 120 commodities, by 14 major trading partners (the United States, Canada, Mexico, Japan, China, Korea, Germany, France, Britain, Italy, Spain, the Netherlands, Belgium, Austria) and two residual regions (the Rest of Europe and the Rest of the World). The forecasting equations are based on annual OECD and UN data on international trade by commodity and country of origin. For 13 of the trade partners (excepting the Netherlands) the country-level variables are determined by simultaneous solutions of Inforum-type dynamic interindustry models.

and export prices. Moreover, changes in prices impact export and import demand with a lag distributed over three years, weighted to be 50 percent in the first year, 30 percent in the second, and 20 percent in the third.[6]

Table 2 displays the macroeconomic impacts of the exchange rate impact alone (i.e., the expenditure switching effect) in the first line for each variable. Concentrating first on trade, we see that a positive impact on real exports starts slowly, but gradually mounts to become 6.3 percent by 2007, 8.1 percent by 2010, and, once all the price lags take affect, 12.3 percent by 2015. Real imports are 7.1 percent lower in 2007, 8.9 percent lower in 2010, and 9.7 percent lower by 2015. On balance, the improvements in real net exports result in a modest increase in overall real GDP totaling 1.0 percent in 2012 and 1.3 percent in 2015.

In nominal terms, we see that, compared to the baseline, the current account balance is actually reduced (i.e., the deficit is larger) by $28 billion in 2004. This effect is commonly known as the J-curve. The balance improves slowly, reaching a positive difference versus the baseline above $100 in 2008. Over the longer term, the current account deficit is reduced by over $300 billion, or over 2 percent of GDP.

The relatively sluggish response of real trade and nominal balances to exchange rate changes reflects the assumptions of 50 percent exchange rate pass-through and a three-year lagged effect of prices on trade quantities. Obviously, these assumptions are among the most important in predicting the ability of exchange rate adjustments to rebalance global demand and supply across currency blocks. Subsequent work can attempt to better estimate these parameters and to examine the implications under different hypotheses for them.

The implications of currency depreciation for other macroeconomic quantities include modest and temporary negative effects on nonresidential investment, and relatively large negative impact on personal consumption and residential housing. These latter consequences result from a reduction in real personal income that level out to approximately 1.5 percent by 2007. Because of dollar depreciation, the increase in import costs drives up consumer prices by almost 2.0 percent over the simulation horizon, compared to a slight fall in the GDP price. This relative price change represents a fall in the consumers' "terms of trade," and is the classic effect of currency depreciation, and illustrates why depreciation, by itself, cannot be considered a free lunch. Indeed, even as depreciation slightly increases overall real production and employment levels, by 2010 consumers will be worse off by an average of about $1500 per household in 2003 dollars.

Adding an Interest Rate Shock to Accomplish Expenditure Reduction

The second scenario, which we call ES&R, posits that exchange rate changes such as those analyzed here could be associated with a run-up in long-term exchange rates as international investors reduce their purchases of dollar denominated assets. The actual path of exchange and interest rates will depend on a complex interplay of the domestic savings-investment balance,

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[6]   These price lags are incorporated into the relative price term of the model's econometric import and export equations

foreign capital flows, domestic inflation, and Federal Reserve policy. We are not trying to predict the outcome of that interplay here. Rather, we want to provide an illustration of what a relatively modest but plausible run-up in domestic interest rates might mean to the economy. To accomplish this, we simply add to the exchange rate changes of the ESO scenario exogenous additions to the interest rates.

For each scenario, the nominal interest rate changes for the 3-month Treasury bill and the 10-year Treasury bond rates implemented in the model are shown in Table 3.[7] Essentially, the nominal increases in the 3-month Treasury Bill rate compared to the baseline are due to an endogenous reaction of the Federal Reserve to higher inflationary pressures. Most of the total differential inflationary impact of depreciation is confined within the 2004-2006 time frame. Therefore, by 2007 increment in short-term rates relative to the baseline are only 50 basis points in the ESO alternative and 30 basis points in the ES&R alternative. The lower impact in the former case is because the inflationary consequences are slightly lower.

For the 10-year bond rate, the differences from the baseline are due to an endogenous reaction to higher inflation, and, for the case of the ES&R, the exogenously administered "add factor" used to simulate a market-based increase in long bond yields. These "exogenous shocks" are also displayed in the table. For example, at the height of the shock in 2007 the exogenous addition to the long bond is 150 basis points. The endogenous increment is 40 basis points. Therefore, in total, the 10-year bond yield is 190 basis points greater than in the baseline.

Unsurprisingly, Table 2 shows that the addition of the interest rate shock results in a much less favorable scenario. Concerning trade, the increase in real exports is a somewhat less vigorous than ESO because higher U.S. interest rates imply slower world growth. Given the large reduction of domestic demand (see below), real imports in ES&R are much reduced compared to the baseline and the ESO alternative. In total, compared to the baseline real imports are 13 percent lower by 2015. Overall, GDP is reduced by a peak of 2.2 percent in 2006, and it is still 0.8 percent lower in 2015, after 12 years of adjustment.

Given that ES&R results in a larger contraction in real imports compared to ESO, we might expect a correspondingly larger reduction of the current account deficit. Initially, this expectation is met. In 2004, the nominal balance rises by $15.6 billion compared to the baseline, as opposed to a fall of $28.1 billion for ESO. In 2005, there is an improvement of $58.4 billion compared to $4.7 billion. However, by 2007, the current account balance in ES&R increased by $85.6 billion compared to $77.0 billion in ESO, an increment of only $13 billion. In 2009, while the balance remains greater compared to baseline, the improvement is actually lower than in ESO. The reason for perhaps counter-intuitive result is that the higher relative domestic interest rates in ES&R generate much larger net foreign factor payments. In fact, for ES&R the U.S. disburses a total of $303 billion more in net factor payments over the 12 year scenario horizon, countering virtually all of the trade balance improvement that occurs from expenditure reduction. Not only do these payments increase the current account deficits, they represent a direct loss of income and investment to the nation.

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[7] There are several other interest rates in the model, but each of them is determined relative to the 3-month Treasury bill or 10-year Treasury bond.

Indeed, in ES&R nonresidential structures and equipment investment are 7.5 percent and 8.2 percent lower by 2006. These falls are ameliorated in the longer run as nonresidential investment bounces back to take advantage of export and import-competing opportunities. The biggest hit of all is felt by the interest-rate sensitive housing sector, which contracts by 13.1 percent in 2006, before recovering in the longer run.

Personal consumption is down by 3.8 percent by 2006 and 5.7 percent by 2015. This persistent and relatively large reduction is due to a more or less permanent reduction in real income of around 2.6 percent, an increase in the personal savings rate, and a large and stubborn, though not permanent, reduction in employment. The long-run loss of household income, due to aforementioned terms-of-trade effects and increased foreign factor payments, is significant, reaching $3000 per household by 2010, in 2003 dollars.

Finally, Figure 3 shows that under either scenario, significant, albeit greatly lessened, current account deficits remain, especially in the near-term. By 2010, the current account deficits for the alternative scenarios fall to about 3.0 percent of GNP relative to around 4.0 percent in the baseline. Over the next five years improvement is much larger. Under the alternatives the ratio falls to about 1.0 percent by 2015 as opposed to 3.0 percent in the baseline.

Foreign investors might be willing to finance such levels over the next decade. Indeed, this scenario could still be characterized as a "soft-landing." But if investors will not or cannot sustain such capital inflows, an even larger adjustment will be necessary. A series of currency and financial shocks larger than those shown here could eventually result in a much harder landing for Americans.

Industrial Impacts

The LIFT model is a particularly useful tool to examine the industrial impacts of currency changes since it contains individual import and export equations for each tradable commodity. Similarly, each industry reacts to interest rate changes depending on the interest-rate sensitivity of each industry's end-markets. For example, if interest rate spikes retard the sales of auto vehicles, the domestic production of the motor vehicle industry, and all the industries that supply the motor vehicle industry, will be impacted negatively in proportion to the demand reduction.

Table 4 illustrates the industry results for the two scenarios. This table displays the percentage difference in current price gross output for each LIFT industry. Therefore, these differences include price as well as the volume (real) effects.

Given the exchange rate differences under both scenarios, we see that the largest positive impacts occur for exporting and import-competing industries such as Metals (Sectors 32 and 33), Nonelectrical machinery (see especially sectors 35, 37 and 38), Electrical machinery (especially 43-45) and Instruments and Miscellaneous manufacturing (especially 56-58). These improvements are especially large under the ESO scenario, but are also generally evident for the ES&R alternative, despite the decrease in overall economic activity.

In contrast, construction and most of the service sectors suffer declines under both scenarios. Especially for the ES&R scenario, construction is negatively impacted from increased interest rates as well as falls in overall income. Services sectors suffer primarily because of the fall in real income.

In many ways, these industrial impacts represent a mirror image to the patterns that existed in the years following the Asian economic crisis. In contrast to relentless dollar appreciation, it seems reasonable to believe that substantial dollar depreciation will be necessary (if not sufficient) to reduce the U.S. current account balance to more sustainable levels. In these scenarios, we see that substantial falls in the currency greatly increase the competitiveness of manufacturing sectors, albeit through sacrifices in real income and, quite probably, low interest rates. Whatever the actual course of global rebalancing and U.S. macroeconomic adjustment, however, the U.S. manufacturing sector could be on the verge of a modest renaissance. However, more research on sector-specific exchange rate pass through and trade price sensitivity will be needed to reveal which industries will be most prepared to take advantage of this changing environment.

Table 1: Exogenous Exchange Rate Depreciation for Alternative Scenarios

	2004	2005	2006	2007	2009	2012	2015
Canadian dollar							
percent difference from baseline	-10.0	-15.0	-20.0	-20.0	-20.0	-20.0	-20.0
percent change from 2003	-19.0	-27.3	-35.0	-35.0	-35.0	-35.0	-35.0
Mexican peso							
percent difference from baseline	-2.0	-4.0	-6.0	-7.0	-7.0	-7.0	-7.0
percent change from 2003	-2.0	-4.0	-6.0	-6.0	-6.0	-6.0	-6.0
Euro							
percent difference from baseline	-10.0	-15.0	-20.0	-20.0	-20.0	-20.0	-20.0
percent change from 2003	-19.1	-27.4	-35.3	-35.3	-35.3	-35.3	-35.3
British pound							
percent difference from baseline	-10.0	-15.0	-20.0	-20.0	-20.0	-20.0	-20.0
percent change from 2003	-18.7	-27.3	-35.5	-35.5	-35.5	-35.5	-35.5
Japanese yen							
percent difference from baseline	-5.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0
percent change from 2003	-14.5	-23.1	-26.9	-26.9	-26.9	-26.9	-26.9
Korean won							
percent difference from baseline	-8.0	-12.0	-16.0	-16.0	-16.0	-16.0	-16.0
percent change from 2003	-15.4	-22.3	-28.8	-28.8	-28.8	-28.8	-28.8
Chinese yuan							
percent difference from baseline	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0
percent change from 2003	-10.0	-19.0	-27.1	-27.1	-27.1	-27.1	-27.1
Total trade weighted dollar*							
percent difference from baseline	-7.5	-11.2	-14.0	-14.0	-14.0	-14.0	-14.0
percent change from 2003	-14.2	-21.3	-27.4	-27.4	-27.4	-27.4	-27.4

* Using Federal Reserve currency weights

**Table 2: Macroeconomic Results for Expenditure Switching Only (ESO)
and Expenditure Switching and Reduction (ES&R) Scenarios**

		2004	2005	2006	2007	2009	2012	2015
National Accounts (Real)								
GDP	ESO	0.1	-0.4	0.3	0.5	0.7	1.0	1.3
	ES&R	-0.7	-2.1	-2.2	-2.1	-1.8	-1.2	-0.8
Personal consumption	ESO	0.0	-1.3	-1.1	-1.5	-1.9	-2.2	-2.5
	ES&R	-0.9	-3.3	-3.8	-4.6	-5.4	-5.5	-5.7
Investment								
Nonresidential structures	ESO	-0.7	-2.2	-2.1	-1.2	0.0	0.0	0.5
	ES&R	-2.0	-5.8	-7.5	-7.4	-5.0	-2.1	-1.6
Equipment and software	ESO	-0.9	-0.8	-2.4	-1.0	-0.6	-0.9	-0.2
	ES&R	-2.2	-4.1	-8.2	-6.6	-3.0	-1.7	-1.6
Residential structures	ESO	-2.8	-5.1	-3.0	-1.3	-1.4	-1.0	-0.9
	ES&R	-7.4	-12.4	-13.1	-9.4	-5.2	-1.2	-1.4
Exports	ESO	1.7	3.2	5.3	6.3	7.7	9.7	12.3
	ES&R	1.6	2.6	4.5	5.3	6.3	8.2	10.7
Imports	ESO	-1.2	-4.0	-5.8	-7.1	-8.5	-9.4	-9.7
	ES&R	-2.6	-6.9	-10.0	-11.4	-12.3	-12.8	-13.1
Government expenditures	ESO	-0.3	-0.3	-0.5	-0.5	-0.5	-0.5	-0.6
	ES&R	-0.3	-0.2	-0.2	-0.1	-0.1	-0.4	-0.6
Other Variables								
GDP prices	ESO	0.0	-0.3	-0.1	-0.1	-0.1	-0.1	-0.2
	ES&R	-0.1	-0.7	-0.8	-1.2	-1.8	-2.2	-2.3
Consumer prices	ESO	0.8	1.1	1.6	1.6	1.8	1.9	2.1
	ES&R	0.7	0.7	0.9	0.6	0.3	0.2	0.2
Real personal income	ESO	-0.7	-1.4	-1.6	-1.5	-1.5	-1.4	-1.2
	ES&R	-0.9	-2.0	-2.6	-2.8	-3.1	-2.9	-2.6
Employment (millions)	ESO	0.0	-0.8	-0.2	0.1	0.3	0.6	0.9
	ES&R	-1.1	-3.5	-4.1	-4.2	-3.8	-2.9	-2.5
Employment (percent)	ESO	0.0	-0.6	-0.2	0.1	0.2	0.4	0.6
	ES&R	-0.8	-2.4	-2.8	-2.8	-2.4	-1.8	-1.6
Current account (bill $)	ESO	-28.1	4.7	31.4	77.0	142.5	233.9	373.4
	ES&R	15.6	58.4	96.7	85.6	100.5	250.1	398.0
% of GDP	ESO	-0.2	0.0	0.3	0.6	1.0	1.4	2.0
	ES&R	0.1	0.4	0.6	0.5	0.6	1.5	2.1

Table 3: Interest Rate Differences for Alternatives

Differences in nominal interest rates from baseline (in hundreds of basis points)

		2004	2005	2006	2007	2009	2012	2015
Treasury bills, 3-month	ESO	0.3	0.8	0.6	0.5	0.3	0.1	0.0
	ES&R	0.3	0.7	0.5	0.3	0.1	0.0	0.0
Yield, 10 yr. Treas bonds	ESO	0.2	0.5	0.5	0.2	0.2	0.2	0.1
	ES&R	1.0	1.4	1.9	1.0	0.5	0.0	0.0
(Exogenous addition for ES&R)		0.8	1.0	1.5	1.0	0.5	0.0	0.0

Table 4: Current Price Output by Producing Sector

Titles of Alternate Runs
Line 1: Expenditure Switching Only (ESO)
Line 2: Expenditure Switching and Reduction (ES&R)

Alternatives are shown in percentage deviations from baseline.

	2004	2005	2006	2007	2009	2012	2015
1 Agriculture, forestry, & fishery	**1.3**	**1.5**	**2.8**	**3.1**	**3.3**	**3.7**	**4.3**
	0.6	**-0.2**	**0.5**	**0.3**	**-0.1**	**0.2**	**0.7**
Mining	**0.3**	**0.3**	**1.1**	**1.6**	**2.0**	**2.7**	**3.5**
	-0.2	**-0.8**	**-0.6**	**-0.3**	**0.2**	**1.0**	**1.8**
2 Metal mining	1.2	2.7	4.7	6.1	8.0	9.5	11.3
	0.8	0.9	1.8	2.0	3.5	5.7	7.6
3 Coal mining	0.3	0.0	0.9	1.2	1.5	1.9	2.4
	-0.5	-1.7	-1.5	-1.3	-0.9	-0.1	0.6
4 Natural gas extraction	0.2	0.1	0.7	1.2	1.4	1.9	2.5
	-0.2	-0.9	-0.7	-0.5	-0.1	0.5	1.1
5 Crude petroleum	0.2	0.1	0.6	0.8	1.1	1.5	2.0
	-0.2	-0.7	-0.5	-0.3	0.0	0.6	1.0
6 Non-metallic mining	0.5	1.1	3.1	4.1	5.5	7.0	8.8
	-0.5	-1.1	-0.2	0.3	1.3	3.5	5.3
Construction	**-0.5**	**-1.5**	**-0.6**	**0.1**	**0.4**	**0.6**	**0.9**
	-2.1	**-4.7**	**-5.4**	**-4.8**	**-3.7**	**-2.4**	**-2.4**
7 New construction	-1.7	-3.1	-2.3	-1.0	-0.5	-0.3	0.1
	-4.2	-7.8	-9.1	-7.5	-5.0	-2.5	-2.7
8 Maintenance & repair construct	0.4	0.0	0.8	1.0	1.2	1.4	1.7
	-0.4	-2.1	-2.3	-2.5	-2.6	-2.3	-2.2
Non-Durables	**1.2**	**1.1**	**2.8**	**3.6**	**4.6**	**5.8**	**7.1**
	0.2	**-1.5**	**-1.0**	**-1.0**	**-0.5**	**1.0**	**2.4**
9 Meat products	1.2	1.5	2.4	2.6	2.8	3.1	3.6
	0.9	0.4	0.7	0.2	-0.4	-0.4	0.0
10 Dairy products	1.0	1.0	1.8	1.9	1.8	1.9	1.9
	0.7	-0.2	-0.2	-0.9	-1.8	-2.0	-2.1
11 Canned & frozen foods	0.9	1.0	1.9	2.2	2.3	2.4	2.6
	0.6	-0.3	-0.2	-0.8	-1.6	-1.6	-1.4
12 Bakery and grain mill product	1.1	1.1	2.2	2.5	2.6	2.9	3.4
	0.6	-0.7	-0.5	-1.2	-1.9	-1.8	-1.4
13 Alcoholic beverages	0.9	0.9	2.5	3.3	3.7	4.3	5.0
	0.1	-1.6	-1.3	-1.5	-1.9	-1.3	-0.7
14 Other food products	1.3	1.6	3.0	3.4	3.6	4.1	4.5
	0.9	0.1	0.8	0.3	-0.3	-0.1	0.3
15 Tobacco products	1.1	1.5	2.1	2.4	2.4	2.5	2.7
	1.0	1.0	1.1	0.7	0.1	-0.2	0.0
16 Textiles and knitting	1.5	0.8	3.5	5.1	7.2	8.8	9.6
	-0.3	-3.4	-2.0	-1.0	0.9	3.3	4.4

Table 4: Current Price Output by Producing Sector (continued)

Titles of Alternate Runs
Line 1: Expenditure Switching Only (ESO)
Line 2: Expenditure Switching and Reduction (ES&R)

Alternatives are shown in percentage deviations from baseline.

	2004	2005	2006	2007	2009	2012	2015
17 Apparel	1.1	-0.4	1.5	3.8	7.7	10.7	11.7
	-0.6	-4.4	-3.9	-2.5	0.1	3.2	4.6
18 Paper	1.0	0.2	1.6	2.0	2.1	2.2	2.5
	-0.3	-3.2	-3.3	-3.7	-3.9	-3.4	-3.0
19 Printing & publishing	0.8	-0.7	0.7	0.9	1.0	1.4	1.8
	-1.2	-5.3	-5.9	-6.7	-7.0	-6.2	-5.5
20 Agricultural fertilizers and	1.8	2.6	4.7	5.4	6.3	7.5	9.1
	1.2	0.8	2.4	2.3	2.9	4.4	6.0
21 Plastics & synthetics	2.0	3.4	6.3	7.8	9.9	12.1	14.4
	1.5	1.2	3.1	3.7	5.9	9.0	11.5
22 Drugs	2.7	4.8	8.1	9.4	10.6	12.1	13.5
	2.4	3.1	5.4	5.5	6.1	7.8	9.5
23 Other chemicals	1.3	2.2	4.6	6.2	9.2	13.7	19.2
	0.7	0.0	1.4	2.0	4.6	9.4	14.9
24 Petroleum refining	0.3	-0.6	0.5	1.2	1.5	2.2	2.8
	-1.1	-3.9	-4.0	-3.8	-3.2	-2.0	-1.3
25 Fuel oil	0.4	-0.6	0.5	1.1	1.3	1.8	2.4
	-1.0	-4.0	-4.2	-4.1	-3.5	-2.5	-1.7
26 Rubber products	1.2	1.9	3.9	4.9	5.7	6.5	7.6
	0.6	-0.2	0.8	1.1	1.7	2.5	3.7
27 Plastic products	1.1	1.8	3.8	5.0	6.1	7.2	8.2
	0.3	-0.6	0.1	0.7	1.7	3.2	4.3
28 Shoes & leather	0.8	-2.3	-1.3	-2.1	-1.7	-0.5	1.5
	-1.5	-7.5	-7.7	-9.7	-10.4	-8.5	-6.4
Durables	**1.6**	**2.2**	**6.0**	**8.1**	**9.6**	**10.8**	**12.0**
	-0.7	**-3.1**	**-1.6**	**0.0**	**2.5**	**5.2**	**6.2**
29 Lumber	0.9	-0.4	3.7	4.7	5.4	6.7	7.9
	-3.0	-8.0	-6.1	-4.8	-2.7	0.5	1.5
30 Furniture	0.9	1.2	2.8	4.1	4.5	4.7	4.5
	-1.0	-3.1	-3.7	-2.7	-1.3	-0.2	-0.6
31 Stone, clay & glass	1.5	2.3	5.9	7.3	8.7	9.9	10.9
	-0.2	-1.2	0.9	2.2	4.2	6.4	7.1
32 Primary ferrous metals	1.8	2.9	8.7	13.0	15.4	16.9	19.0
	-1.1	-4.0	-1.5	1.8	5.6	9.0	10.8
33 Primary nonferrous metals	2.9	3.8	8.2	11.2	13.7	15.8	17.6
	0.3	-2.8	-1.4	0.7	4.6	8.5	10.3
34 Metal products	1.7	2.8	6.3	8.1	9.8	10.8	11.6
	0.0	-1.3	0.1	1.3	3.6	5.9	6.7

Table 4: Current Price Output by Producing Sector (continued)

Titles of Alternate Runs
Line 1: Expenditure Switching Only (ESO)
Line 2: Expenditure Switching and Reduction (ES&R)

Alternatives are shown in percentage deviations from baseline.

	2004	2005	2006	2007	2009	2012	2015
Non-Electrical Machinery	**1.0**	**1.9**	**3.6**	**5.4**	**7.2**	**7.9**	**9.6**
	-0.3	**-1.4**	**-1.7**	**-0.4**	**2.6**	**4.4**	**5.6**
35 Engines and turbines	3.3	4.6	8.6	9.8	11.4	12.7	14.7
	1.9	1.2	3.5	3.9	5.4	7.3	8.9
36 Agr., constr., mining & oilfi	0.2	0.9	2.0	4.1	6.1	7.3	9.3
	-1.0	-2.5	-3.7	-2.4	0.7	2.9	4.2
37 Metalworking machinery	1.7	4.0	7.3	10.3	12.7	11.6	13.6
	0.2	0.0	0.4	2.5	7.8	8.5	9.4
38 Special industry machinery	2.3	4.5	7.8	10.1	12.6	12.9	15.5
	1.1	1.5	2.6	4.1	8.0	9.9	11.9
39 General and misc. industrial	0.8	1.6	4.4	6.4	9.0	10.4	12.5
	-0.4	-1.3	-0.3	0.9	3.8	6.1	7.8
40 Computers	0.5	0.7	0.6	1.7	2.4	3.0	3.8
	-0.7	-2.1	-3.9	-2.7	-0.2	1.1	1.7
41 Office equipment	-0.8	-1.2	-3.5	-0.7	1.4	3.4	4.2
	-3.7	-7.4	-13.5	-10.6	-5.8	-2.1	-1.6
42 Service industry machinery	1.0	1.1	2.9	3.9	4.8	5.0	5.7
	-1.0	-3.2	-3.9	-3.2	-0.9	0.8	1.2
Electrical Machinery	**0.3**	**0.9**	**2.0**	**3.4**	**5.1**	**7.2**	**9.3**
	-0.4	**-1.2**	**-1.2**	**0.1**	**2.4**	**5.1**	**7.2**
43 Elect. indust. app. & dist. e	-2.0	-0.1	3.1	6.1	8.4	11.9	15.9
	-2.6	-2.4	-0.8	1.7	4.9	9.0	13.0
44 Household appliances	0.0	-0.3	1.2	3.1	5.5	10.9	20.7
	-1.7	-3.9	-4.1	-2.6	0.2	6.3	15.8
45 Elect. lighting and wiring eq	0.6	1.2	3.6	6.3	10.6	17.8	21.9
	-0.3	-1.3	-0.4	1.5	5.6	13.4	18.3
46 TV's, VCR's, radios & phonogr	1.7	1.8	3.0	2.8	2.8	3.5	5.0
	1.2	0.0	0.3	-0.6	-1.3	-0.5	1.3
47 Communication equipment	0.3	0.9	0.7	1.4	1.8	2.7	3.4
	-0.1	-1.0	-2.5	-2.0	-0.5	0.5	1.1
48 Electronic components	0.8	1.3	1.8	2.9	4.0	5.0	6.4
	0.0	-0.6	-0.6	0.6	2.6	4.0	5.2

Table 4: Current Price Output by Producing Sector (continued)

Titles of Alternate Runs
Line 1: Expenditure Switching Only (ESO)
Line 2: Expenditure Switching and Reduction (ES&R)

Alternatives are shown in percentage deviations from baseline.

|	2004	2005	2006	2007	2009	2012	2015
Transportation Equipment	**2.4**	**2.9**	**6.1**	**6.8**	**7.9**	**8.3**	**9.5**
	0.8	**-0.5**	**0.7**	**0.8**	**1.5**	**2.7**	**4.0**
49 Motor vehicles	2.9	3.3	7.0	7.5	8.7	8.8	9.9
	0.6	-1.4	-0.3	-0.3	1.1	2.5	3.8
50 Motor vehicle parts	2.4	2.9	6.3	6.9	8.3	8.6	9.8
	0.8	-0.5	0.8	0.6	0.7	2.0	3.7
51 Aerospace	1.8	2.8	4.9	6.2	7.0	8.0	9.4
	1.8	2.3	4.2	5.1	5.3	5.7	6.7
52 Ships & boats	1.1	0.7	2.7	3.2	4.5	6.0	8.5
	-0.3	-2.6	-2.4	-2.9	-2.8	-1.7	-0.1
53 Oth transportation equipment	1.1	1.0	2.7	3.1	3.6	3.4	3.9
	0.1	-2.0	-2.3	-2.6	-1.9	-1.8	-1.4
Instruments	**2.0**	**4.0**	**6.6**	**8.8**	**11.1**	**13.3**	**15.1**
	1.4	**2.2**	**3.2**	**4.7**	**7.0**	**9.4**	**11.0**
54 Search & navigation equipment	0.9	1.9	2.1	3.4	3.9	5.0	6.1
	0.7	0.7	0.0	1.0	1.8	2.9	3.9
55 Medical instruments & supplies	1.0	1.6	2.5	3.4	4.3	5.0	5.5
	0.2	-0.6	-1.5	-1.4	-0.3	0.8	1.3
56 Opthalmic goods	3.1	5.6	11.3	14.4	20.2	26.4	28.1
	2.4	3.4	7.7	9.7	13.8	19.1	20.9
57 Other instruments	3.2	6.8	11.6	15.0	19.2	23.1	26.6
	2.6	5.0	8.2	10.9	14.9	18.7	21.9
58 Miscellaneous manufacturing	3.6	6.7	12.0	14.3	16.3	18.8	20.3
	2.7	4.2	8.0	9.7	11.4	14.2	15.6
Transportation	**0.7**	**0.4**	**1.6**	**2.0**	**2.6**	**3.2**	**4.1**
	-0.1	**-1.8**	**-1.6**	**-1.8**	**-1.6**	**-0.8**	**-0.1**
59 Railroads	0.7	1.0	1.9	2.8	3.7	4.5	5.5
	0.4	-0.1	-0.1	0.0	0.2	0.8	1.8
60 Trucking, highway pass transit	0.5	0.3	1.2	1.7	2.2	2.7	3.3
	-0.2	-1.4	-1.4	-1.5	-1.4	-0.8	-0.2
61 Water transport	1.1	1.1	2.5	3.2	3.9	4.8	6.2
	0.1	-1.2	-0.8	-0.7	0.0	1.2	2.4
62 Air transport	1.0	0.0	2.0	2.2	2.6	3.4	4.5
	-0.5	-3.6	-3.2	-3.7	-3.5	-2.2	-1.6
63 Pipeline	0.5	0.7	1.5	1.9	2.5	3.3	4.4
	0.4	0.1	0.4	0.2	0.2	0.8	1.7
64 Transportation services	1.0	1.0	2.0	2.2	2.6	3.2	3.9
	0.5	-0.3	0.0	-0.3	-0.7	-0.5	0.3

Table 4: Current Price Output by Producing Sector (continued)

Titles of Alternate Runs
Line 1: Expenditure Switching Only (ESO)
Line 2: Expenditure Switching and Reduction (ES&R)

Alternatives are shown in percentage deviations from baseline.

	2004	2005	2006	2007	2009	2012	2015
Utilities	**0.4**	**0.2**	**0.7**	**1.1**	**1.2**	**1.5**	**1.8**
	0.1	**-1.0**	**-0.9**	**-1.0**	**-1.3**	**-1.3**	**-1.1**
65 Communications services	0.4	0.1	0.7	0.9	1.1	1.4	1.8
	0.1	-1.0	-1.1	-1.5	-2.0	-2.0	-1.7
66 Electric utilities	0.3	0.1	0.7	1.2	1.1	1.3	1.4
	0.2	-1.1	-0.8	-0.7	-0.7	-0.9	-1.2
67 Gas utilities	0.2	0.3	0.8	1.5	1.6	2.0	2.5
	0.2	-0.5	-0.2	0.2	0.4	0.6	0.8
68 Water and sanitary services	0.5	0.3	1.0	1.3	1.4	1.6	2.0
	0.0	-1.1	-1.1	-1.2	-1.3	-0.9	-0.6
Trade	**0.0**	**-0.9**	**-0.3**	**-0.3**	**-0.4**	**-0.4**	**-0.3**
	-1.0	**-3.1**	**-3.4**	**-3.9**	**-4.6**	**-4.7**	**-4.6**
69 Wholesale trade	0.2	-0.1	0.8	1.3	1.6	2.2	2.9
	-0.7	-2.1	-2.1	-1.9	-1.7	-1.2	-0.7
70 Retail trade	-0.4	-2.1	-1.6	-2.1	-2.7	-3.0	-3.4
	-1.6	-4.7	-5.3	-6.3	-7.6	-8.1	-8.5
71 Restaurants & bars	0.6	-0.2	0.3	0.1	-0.2	-0.3	-0.5
	-0.1	-1.9	-2.2	-3.1	-4.3	-4.8	-4.9
Finance, Insur & Real Estate	**0.3**	**-1.3**	**-0.4**	**-0.6**	**-0.7**	**-0.6**	**-0.5**
	-1.2	**-4.6**	**-5.0**	**-5.8**	**-6.2**	**-5.8**	**-5.6**
72 Finance & insurance	0.4	-1.9	-0.4	-0.6	-0.5	-0.3	0.2
	-1.8	-6.6	-7.1	-8.3	-8.7	-8.0	-7.4
73 Real estate & royalties	0.2	-0.5	0.2	0.4	0.3	0.5	0.9
	-0.8	-2.5	-2.6	-2.3	-2.1	-1.6	-1.2
74 Owner-occupied housing	0.1	-1.3	-1.1	-1.6	-2.2	-2.6	-3.1
	-0.9	-3.7	-4.5	-5.6	-6.7	-7.2	-7.6

Figure 1: U.S. Current Account Balance in Billions of U.S. Dollars
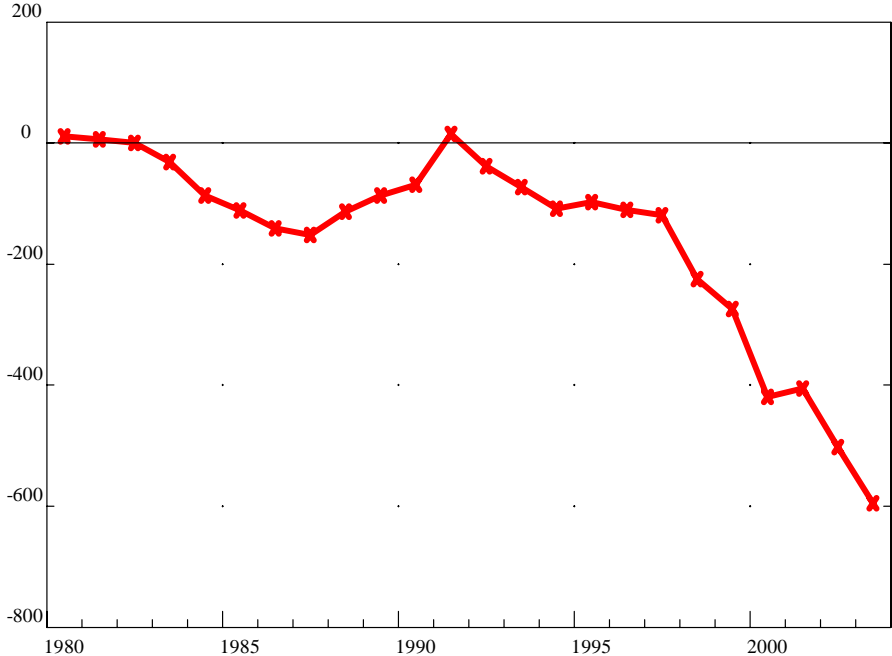
**Figure 2: Percentage Change in the U.S. Dollar vs. Selected Currencies
January 1, 2002 through June 9, 2004**
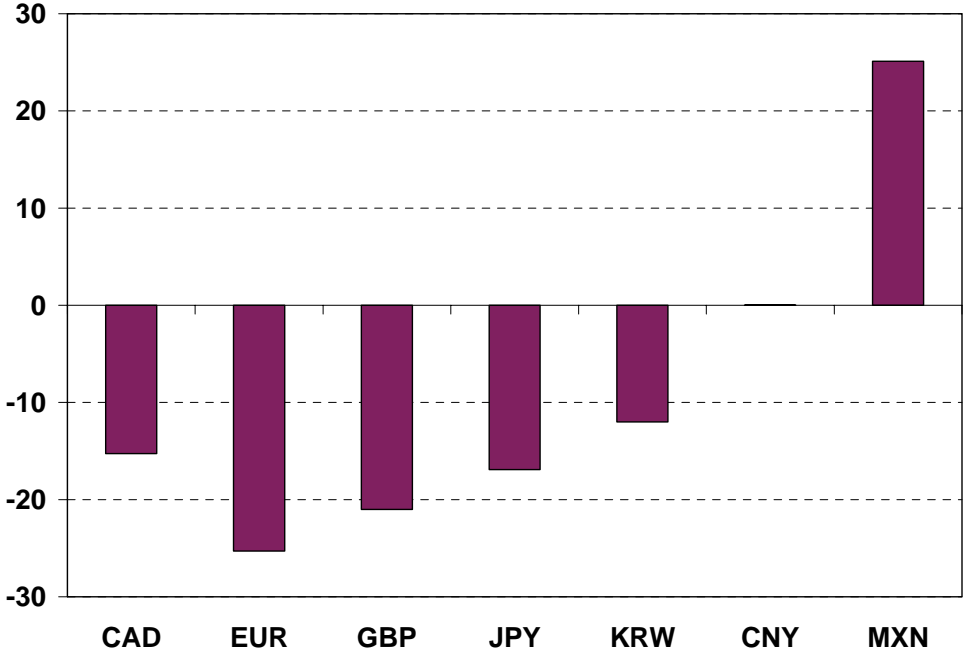
Figure 3: U.S. Current Account Balance as Percentage of GNP Simulation Results 2004-2015