

ALTERNATIVE POLICIES FOR US ECONOMIC RECOVERY

BY

BYRON GANGNES



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2424 MAILE WAY, ROOM 540 • HONOLULU, HAWAII 96822
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Byron Gangnes
Department of Economics
University of Hawaii at Manoa

Abstract

Recovery has begun in the United States and global economies. The US recovery is likely to be anemic by historical standards, raising the possibility that additional stimulus may be desirable. The President and Democrats in Congress have called for a “jobs bill,” and the Federal Reserve has demonstrated that it has a flexible toolkit for providing additional liquidity if deemed appropriate. The possible need for such stimulus will come up against the reality of an expanding public debt on the one hand, and inflationary concerns on the other. In this paper, I use simulations of the IHS Global Insight Model to assess the potential impact on the recovery path of alternative macro policies.

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Alternative Policies for US Economic Recovery

Byron Gangnes¹

University of Hawaii at Manoa

The financial crisis that gripped the US and world economies in the Fall of 2008 has eased following the adoption of unprecedented policy interventions.² The past six months have brought welcome signs that the deep and long global recession has bottomed out and that recovery is underway. In Asia a rebound of world trade and the application of extensive fiscal stimulus have reignited growth in China, and, slowly, in Japan. In Europe, Germany and France returned to positive, though very slow, growth in the second quarter of last year. The Eurozone as a whole expanded in the year's second half, although prospects are for tepid growth in early 2010. The IMF has been raising their growth forecasts in recent months; they now expect nearly 4% global growth in 2010, compared with a July 2009 estimate of 2.5%.

The US economy returned to positive growth in the third quarter of last year and expanded at a brisk 5.7% rate in the fourth quarter according to the advance estimate. Much of this growth is the result of the winding down of the inventory cycle, but at least modest growth is occurring across most spending categories. Financial markets have recovered half or more of the

¹ A version of this paper was originally prepared for the International Conference on Policy Model Analysis of the Impacts of Global Financial Crisis and Its Recovery Process of USA and Japan in the Context of Asian Economy, Center for Global Partnerships, Tokyo, September 2009. I also benefited from comments received during presentations at the United Nations Project LINK conference, Bangkok, Thailand, October 2009, and at the Institute of Developing Economists/JETRO, Chiba, Japan, December 2009. Thanks to F. Gerard Adams for generous and valuable comments. I would like to thank Nigel Gault and Nariman Behravesch for access to the IHS Global Insight model and forecasts. All conclusions are my own and not those of IHS Global Insight.

² Adams and Gangnes (2009b) reviews policies that have previously been implemented by the United States government and the Federal Reserve to address the financial crisis and recession.

losses they suffered during the recession. In the battered housing market, housing starts have bottomed out, and sales of new homes have begun to recover. The strongest performance has been in the manufacturing sector, where expansion has been underway for six months and is relatively broad-based.

Other indicators show an economy that is still struggling to get back on a firm footing. In the labor market, small net job losses are still occurring, although well off the 600,000+ monthly job losses seen earlier in 2009. In January, the unemployment rate edged down to 9.7%, but new claims for unemployment compensation remain stubbornly high. Business fixed investment is still anemic. The recovery in housing markets may face a setback when generous government incentives expire later this spring.

The greatest concern at present is continuing weakness in consumer spending. Retail sales are expanding modestly, but they have considerably further to go to recover from the 10% drop they experienced at the peak of the recession. Automobile sales were stimulated by last fall's "cash for clunkers" program, but have fallen back somewhat since then. Because consumer spending represents 70% of all spending, significant recovery will not begin until consumption is firmly back on track.

When the National Bureau for Economic Research eventually announced the quasi-official dating for the past recession, it is likely that the business cycle turning point to recovery will have occurred early in the second half of 2009. But there is considerable uncertainty about the nature of that recovery, and about the likely evolution of macroeconomic policy. In this paper I describe several potential challenges to US economic recovery, and I use simulations of the IHS Global Insight model to assess the impact on the recovery path of alternative policies.

Recovery Prospects and Challenges

There are reasons to expect that the US recovery will be subpar, constrained by weakness in consumer spending. During much of the past decade, high consumer spending was supported by rising home prices and a buoyant stock market. During the downturn, however, American households lost more than \$12 trillion dollars of wealth, both from falling home prices and stock portfolios. Many families are saddled with mortgages that exceed the value of their homes. The high rate of foreclosures threatens to keep home prices at low levels for some time. As families work to rebuild their financial health in coming years, their spending on goods and services will necessarily grow less rapidly than it did in the past decade.

On the other hand, the pullback of US consumer spending has been quite dramatic and some experts, therefore, see a substantial rebound once recovery is underway. Car sales have fallen to levels that are likely below the replacement rate, and spending on other “big ticket” items has also languished. As income and job prospects improve, pent up demand could lead to a larger-than-expected rise in sales.³

Business investment will recover as sales pick up. Despite evidence of a bottoming of the housing market, it is hard to see a strong rebound in residential construction for some time. We have just passed through an exceptional housing boom that facilitated a rise in home ownership rates to a historically high level of 69.1% in early 2005. With more conservative lending practices restricting demand growth and a glut of new homes, residential building will likely be restrained.

The strength of the US recovery will depend importantly on how robust is the recovery in the rest of the world. Here, the early snap-back in global trade, particularly in Asia, is

³ In the Appendix, I report alternative forecast simulations showing a more rapid recovery of consumer spending and the impact of a return of oil prices to historically high levels.

encouraging. However, at this point it is difficult to disentangle fundamental growth from the effects of the large fiscal stimulus that has been applied in a number of countries. Certainly, a restrained US recovery will limit to some extent growth prospects for the developing world, which in turn would limit growth opportunities for US exports. The growing fiscal crisis in Europe is another concern. Another key external factor will be the evolution of commodity prices, particularly oil. The spike of oil to nearly \$150/bbl in July 2008 contributed to the severity of the current recession (Hamilton 2009), and the pull-back of oil prices last fall was helpful in mitigating the downturn. Rising demand for oil in a recovering global economy will exert upward pressure on prices, although much will depend on the supply response (Adams 2009). At present, in the Global Insight and most mainstream forecasts, only a moderate upward trend is expected.

Given the likelihood of a weak US economic recovery, there may be a need for additional expansionary macroeconomic policy. Both the President and Democratic leaders in Congress have proposed “jobs” programs intended to spur hiring. The Federal Reserve has demonstrated that it has a flexible toolkit for providing additional liquidity if needed. The possible need for such stimulus will come up against the reality of an expanding public debt on the one hand, and inflationary concerns on the other. On the fiscal side, past actions, such as the Bush tax cuts enacted in 2001 and 2003 and expenditures for two costly foreign wars and increased homeland security, have severely eroded the US fiscal position. In recent months, popular concern about projected gaping deficits has increased. And large future outlays for existing public medical and pension programs—plus new proposed health care benefits—also cloud the fiscal future.

On the monetary side, there has been concern, particularly in conservative circles, that the Fed may have sowed the seeds of an inflationary surge through its massive creation of short-term

liquidity. There is no real evidence so far that that is occurring. We might expect to see the first signs of an inflation uptick in measures of inflationary expectations, but expectations measures remain at or below recent historical averages.⁴ And the Fed has already begun to unwind some of the programs it set up in 2008, starting the process of removing liquidity from the economy. Still, inflationary risks are certainly of concern to the Fed and may force it to take a less expansionary stance as the recovery takes hold.

I turn next to a discussion of model simulations that evaluate potential alternative macroeconomic policies and their impact on the US economy.

Simulating Alternative Recovery Paths

In this section I assess alternative recovery paths through forecast simulations of the IHS Global Insight model. (See IHS Global Insight, undated.) The IHS Global Insight model is a large-scale econometric system that describes the operation of the US economy. The quarterly model has at its core a macro structure that largely reflects the *neoclassical synthesis*, in concert with a neoclassical growth model. Short-run business cycle behavior is dominated by developments in aggregate demand, which the model articulates in considerable detail. Demand-supply interactions govern the evolution of wages and prices. Over the long run, the economy expands through labor force growth, capital accumulation and increases in productivity, consistent with Solow-type theoretical models. Consistent with contemporary macro theory, forward-looking expectations also influence the path of the economy. The model economy is linked to the international sector through trade in goods and services, exchange rates and

⁴ Inflationary expectations from the University of Michigan consumer survey were 2.9% in August, up from very low rates earlier this year but roughly equal to the 3% average since 1990. A comparison of yields on the 20-year constant maturity US Treasury bond and an inflation-indexed version of the same implies an inflationary expectation of 2.1%.

commodity prices. The macro model provides only limited sectoral disaggregation, with additional industrial detail provided by a satellite industry model system that does not feed back to the core model. (See Adams and Gangnes 2009 for more detail.)

The Global Insight model system is a “production” forecasting model, used by Global Insight to generate their monthly US forecasts and for simulating alternative developments and policies. The model has a rich set of policy “levers” that can be used to simulate changes in fiscal, monetary and trade policies.

The Global Insight Baseline

The basis for simulation analysis is the September 2009 Global Insight baseline forecast. Because this is a proprietary forecast, I will describe the baseline in general terms and report only a few relevant indicators. The forecast, which was prepared before the release of third quarter figures, shows a return to positive real GDP growth in the third quarter of 2009, but the recovery path is retrained, reflecting weak domestic demand growth and some drag from the international sector. After a surge in consumer durables spending in the fourth quarter of 2009 (largely associated with the “cash for clunkers” auto purchase incentives), demand for big ticket items falls. Consumer spending on nondurables and services are growing steadily by late 2009, but at anemic rates. Reflecting this consumer weakness, business fixed investment does not see double-digit growth until the end of 2010. The residential construction sector turns positive, ending a long period where residential investment was a heavy weight on the economy. Imports, which were falling faster than exports in the first half of 2008, begin to rebound, resulting in a reduction in net exports. Overall, real GDP contracts by 2.5% for 2008 as whole (actual growth was -2.4% according the recently-released fourth quarter advance estimate). GDP manages only

2% growth in 2010 and does not exceed 3% growth on an annual basis until 2012. This is a weak recovery by historical standards.

With the anemic recovery, labor markets remain weak for a number of years. The unemployment rate peaks at 10% early in 2010 and remains above 9% until the beginning of 2012. With slack resources, inflation remains well contained, averaging just over 2% in 2011 and edging down slightly thereafter.

On the policy side, the base solution forecast assumes that the Federal Reserve maintains the current historically low Federal Funds rate through the end of 2010, before gradually tightening to 2.5% by the end of 2011 and 3.5% in mid-2012. With inflation in check, long rates rise only gradually, with the 10-year Treasury bond breaking above 4% by the end of 2011. Global Insight anticipates a winding-down of liquidity over the next three years, although this does not play a role in the model. Consistent with the American Recovery and Reinvestment Act adopted in February, Federal government spending remains high in 2009 and 2010, before gradual reductions during the 2011-2013 period. Despite the gradual fiscal retrenchment, publicly held debt as a percent of GDP rises from below 37% in 2007 to 61.3% in 2010 and above 70% in 2014. Wage and salary payments and spending by state and local governments fall slightly through 2010, reflecting continuing budget problems. These declines would have been larger in the absence of the Federal stimulus program, which includes direct aid to states.

Over the medium term, growth in real gross domestic product averages about 2.5%. Trend output growth is driven by an approximately 2% rate of productivity growth and a roughly 0.7% rate of growth in the labor force. The latter represents a substantial slowing of labor force growth as the US population ages. The labor force was growing at an average annual rate of

about 1% earlier this decade, down from 1.2% in the 1990s and 1.7% in the 1980s. The labor market only slowly recovers, with the unemployment rate falling gradually toward 6% in 2019.

Developments since the time of the September IHS Global Insight forecast have not diverged substantially from the forecast path. As expected, recovery is progressing but not at a brisk pace. Labor markets remain weak and price pressures well contained. The economy's road back to relative health remains likely to be a long one.

Alternative Policy Scenarios

The baseline Global Insight forecast describes a realistic path for the US economy given current assumptions about the pace of private spending recovery, the external environment and macroeconomic policy. In the current environment there remains considerable uncertainty about many of these underlying assumptions. Depending on political developments and the evolution of public debate, it is possible that macroeconomic policy will be altered considerably from these baseline assumptions.

The current US political environment has very mixed implications for policy. On the one hand, there is much official satisfaction that the TARP program and other efforts at quantitative and qualitative easing have had the desired effect on financial markets. At this point, financial markets are again operational and fears that the recession would turn into a Great Depression are behind us. On the other hand there has been concern not only about the depth of the recession and the persistence of high unemployment, but also that the fiscal situation of the US government has deteriorated radically with deficits now amounting to \$1.4 trillion, approximately 10% of GDP. This means that additional stimulus programs will be difficult to enact even if they are required, as the baseline forecast suggest they will. In the first set of

simulations, I assume that political barriers can be overcome and look for a combination of policies that will bring the US economy back toward a full employment growth path by 2012. A reasonable target may be to bring the unemployment rate to approximately 5% over that time period. It is probably premature to ask about future policy beyond that point, although there will be challenges as efforts are made to reduce the deficit and to unwind the contribution to liquidity made by the Fed and the Treasury. The policy posture should also be consistent with the policies of other countries; indeed, a coordinated international policy will likely have added benefit for the US as well as for other countries. It is possible, of course, that economic developments or political pressure will lead to a very different outcome, such as a premature cutback in public spending or withdrawal of funds from financial markets. I provide simulations of these possibilities at the conclusion of the section.

Here I use the IHS Global Insight model to simulate several alternative forecast paths. Unless otherwise indicated, all scenarios begin in 2010:3 and run through 2019:4. A summary of alternative scenario paths is given in Table 1, and details are given in Tables 2-8.⁵

Scenario 1. Persistent expansionary monetary policy

Additional monetary stimulus is difficult to introduce into the model since direct quantitative and qualitative easing has no place in the system, which focuses largely on interest rates. Consequently, changes in short-term (and possibly long-term) rates have to be inserted explicitly. In the base solution I assume that interest rates remain at their current low levels through 2010. The simulation makes adjustments in interest rates so that a low interest rate policy is maintained for several more years. The Federal Funds rate is held in its current 0-0.25% range until the end of 2011, remains at 1% through 2013, converging to the baseline 4.7% rate

⁵ The model's multiplier response to standardized policy shocks is reported in Adams and Gangnes (2009a).

over the next three years. The model response maintains the 10-year bond rate near 3% through 2012, rising thereafter.

Considering the already-low baseline interest rates, the policy has little impact on the forecast path (Table 2). There is a modest stimulus to investment that is offset after several years by a contraction in consumption, apparently the result of lower interest income. The lower rates also trim about \$100 billion off annual Federal government interest costs, contributing to a modest improvement in the Federal budget position. There is no significant impact on inflation. Absent direct effects of Fed policy on credit availability and spending beyond the modeled interest rate channels, the simulation suggests that there is little scope for monetary stimulus in the near term. Monetary accommodation may be more important in combination with fiscal stimulus. I will consider this below.

Scenario 2. Significant additional fiscal stimulus

It had been widely assumed that the \$787 billion stimulus expenditure program enacted in February was only the first stage, for the first two years, of recovery efforts. At present, it is not clear that additional expenditures will be enacted, however an anemic recovery may call for additional stimulus. Here, I simulate a second stage of stimulus, a large and comprehensive fiscal stimulus, including \$100 billion annually in new Federal consumption, \$100 billion annually in new government investment at the Federal and State levels, a two-percentage-point reduction in effective Federal personal income tax rates, and the implementation of a 5% investment tax credit.⁶ Government spending is allocated within consumption and investment according to 2008 spending shares. The stimulus is implemented in 2010:3 and is maintained at

⁶ There is an existing 8% investment tax credit for research and development in the baseline forecast, which is raised to 13% in the simulation.

that level as long as unemployment remains higher than 7%. This implies that it will be phased out over the 2012-2013 period. Monetary policy is allowed to adjust endogenously according to the Fed's reserve targeting rule.

US output surges ahead 6% in 2011 (Table 3), with the biggest contributors a 16% increase in business fixed investment and a 5.6% rise in spending on consumer durables. Inflation builds up slowly, averaging just 0.3 percentage points higher than baseline levels in 2011, rising to 2.6% in 2015, 0.7 percentage points above base. The large fiscal stimulus succeeds in reducing the unemployment rate by nearly two percentage points to 6.7% in 2012. (This is five years earlier than in the baseline.) The rate edges up thereafter as fiscal stimulus is phased out.

The capital deepening that occurs through the public investment and incentives to private sector investment raises productivity about 1.7% in 2011 and about 0.6% permanently. There is a large impact on the international sector. By 2012, real imports have risen 12.3% above their baseline level, and the US current account deficit widens by \$176 billion. Because of endogenous growth in personal income tax revenues, the impact on the Federal budget is limited. The Federal debt rises by \$300 billion by 2013, but actually declines a bit as a percent of GDP because of stronger growth.

The economy deteriorates after the stimulus is removed, with very low growth in the 2013-2015 period and rising trade and budget imbalances. The practical difficulty of switching such large stimulus programs on and off requires additional study.

Scenario 3. Combined US fiscal and monetary stimulus

The results of a combined fiscal and monetary policy scenario are shown in Table 4.

Holding short-term interest rates to a lower path results in a slightly larger stimulative impact. The unemployment rate falls to 6.5% in 2012, compared with 6.7% in the fiscal scenario described above. Lower interest costs and the slightly stronger economy cut the budgetary burden of the stimulus package by more than half. There is virtually no difference in inflation under the two scenarios.

Scenario 4. Coordinated foreign stimulus

Concerted US fiscal stimulus can achieve faster growth, but with adverse consequences for the budget and external balances. Political considerations may also be a barrier to aggressive action. There is the potential for coordinated foreign stimulus to help mitigate some of these problems. This foreign growth scenario is intended to illustrate the effect on the US economy of more rapid growth abroad, given that we do not have an integrated global model that would permit simulations of actual foreign policies.

I first simulate the effect of foreign policy measures that cause an acceleration of global growth over the 2010-2013 period (Table 5). Then in the next scenario I combine US fiscal and monetary stimulus with coordinated foreign stimulus.

To simulate foreign stimulus, I assume more rapid growth of real trade-weighted gross domestic product in both of the two key country groupings modeled in the Global Insight system, “Major Trading Partners,” and “Other Important Trading Partners.”⁷ The simulation has about 1.4% faster growth in foreign GDP in 2010, and about 1% faster growth in 2011 and 2012. Growth rises in 2011-2012 to just above 3.5% for major trading partners and nearly 6% for other

⁷ Although model documentation is incomplete, variable descriptions suggest that these parallel the country groupings used by the Federal Reserve in their calculation of weighted average exchange rate indices. In this system, “major trading partners” include the countries of the euro zone, Canada, Japan, the UK, Switzerland, Australia, and Sweden, and “other important trading partners include most other significant trading partners of the US. See Loretan (2005).

important trading partners. After 2012 the growth rate returns to trend.

The faster foreign growth translates into considerably faster US export growth. US real exports rise nearly \$96 billion (2005 dollars) by 2011 and are \$399 billion (13.5%) higher by 2019. The US current account improves by \$423 billion, effectively closing the current account gap—it is only -\$89 billion in 2019. The dollar depreciates about 9% against major currencies by the end of this period.

The trade surge raises US real GDP growth by about one-half percent annually in the 2011-2013 period. The level of real GDP is 2.3% higher than baseline by 2014 and 1.9% higher by the end of the forecast period. The US unemployment rate is 1% lower than baseline by 2013 and still 0.8% below baseline in 2019. Because of endogenous growth in tax revenues, nearly \$1 trillion is shaved off the Federal Budget deficit by 2019 and the debt/GDP ratio stabilizes at about 64.6%, compared with a rise above 76% in the baseline.⁸

Scenario 5. Combined US and foreign stimulus

I combine scenarios 3 and 4 to simulate a coordinated US and foreign stimulus (Table 6). US real GDP growth accelerates to 3.7% in 2010 and 6.8% in 2011 and is 6.2% percent above baseline levels in 2012. The unemployment rate falls to 5.8% by 2012-2013. Even with the additional foreign stimulus, there is considerably US slowing on the 2013-2015 period. Fast foreign growth does help to keep budget and current account deficits in check. There is about a \$100 billion smaller deterioration in the current account in the near term and the trade balance closes by 2019. The Federal debt/GDP ratio remains below 64% in the final years of the

⁸ I make no exogenous changes in the US dollar exchange rate. The model produces a very modest appreciation of the US dollar in the short run and a larger depreciation in the out years, the latter apparently due to a decline in the relative US-foreign real interest rate. The behavior of exchange rates in the model merits further evaluation.

scenario, compared with a rise above 76% in the stand-alone US fiscal and monetary simulation.

Fiscal and Monetary Unwinding scenarios

The above discussion has been concerned with the possibilities for achieving full employment within in the next several years. The current political scene, however, suggest that there is tremendous pressure to unwind some of the stimulus in order to reduce the deficit or to reduce the involvement of the Federal Reserve and the Treasury in the financial system. It is not altogether impossible consequently that, in place of additional stimulus, we might see a premature unwinding of the fiscal and monetary stimulus that has already been applied. These scenarios try to determine the impact of a premature reduction of stimulus expenditures or a premature increase in interest rates.

Scenario 6. Early unwinding of US monetary stimulus

I simulate the effect of an increase in the Federal Funds rate to 3% in 2011 and 6% in 2012 (an increase of 270 basis points by 2012). (See Table 7.) To capture the effect of a phase-out of Fed quantitative easing, I assume an equal rise in the 10-year bond rate, which in turn results in a similar increase in the 30-year conventional mortgage rate. The margin between simulation and baseline interest rates is gradually phased out by 2016.

The interest rate hikes have a relatively limited effect on aggregate output, which falls only 1% below baseline by 2013. There are significant impacts on investment, with business fixed investment down 4% and residential investment down 9.6%. Durables consumption is not very interest-sensitive, falling just 1.5% below base. The dollar appreciates nearly 7% against major currencies by 2016 and 2.7% against the currencies of other important trading partners. In response, exports decline 2.6%.

The contractionary monetary policy also has only limited impact on inflation. Annual consumer price inflation is just one-tenth of one percent slower, and the price level only 0.5% lower by 2019.

Scenario 7. Early US fiscal retrenchment

In the baseline scenario, US Federal budget deficits remain large, and the debt-to-GDP ratio rises over the entire forecast horizon. While the rate of increase declines over time, in 2019 the ratio of publicly held debt to GDP is at 76% and still rising. (Total Federal debt rises to 110% of GDP.) Because there is considerable unease in the US about rising government indebtedness, it is possible that pressure will build for a more rapid reduction of deficits. In this scenario, I assume that beginning in mid-2010 there are increases in personal income tax rates and reductions in Federal government consumption sufficient to stabilize the debt/GDP ratio below 70%. (Over time, about 70% of the budget adjustment comes from spending cuts, the other 30% from lower tax revenues.)

The sharply contractionary fiscal policy subtracts 1.1% from real GDP in 2010 and 2.1% in 2011. (See Table 8.) After that point, the growth of real GDP accelerates because of lower interest rates and prices. By 2019, real GDP has returned to above 99% of the baseline level. The debt to GDP ratio stabilizes just below 69%, rising above 69% in the final year of the scenario, nearly 7 percentage points lower than in the baseline. The unemployment rate rises an additional 1.3 percentage points in 2010; it remains above 9% in 2012 and does not dip below 8% until 2016.

Despite a significant endogenous reduction in policy interest rates, the fiscal retrenchment has a marked deflationary impact on the economy, with consumer inflation falling

to zero by the end of the forecast horizon. The current account improves initially, but eventually worsens because of real US dollar appreciation.

Conclusions

The simulations of additional fiscal and monetary stimulus, combined with improvement in the world economy outside the United States, show the potential for appropriate macroeconomic policy to improve performance over the coming decade. While it is difficult to return to full employment quickly, the unemployment rate of 5.8% reached in 2012 is not too far above the full employment target. At that point the rate of inflation, 2.8%, remains manageable.

On the other hand, the improved situation may have consequences in commodity markets that are not taken into account in this model system. Higher prices for oil and other key inputs would have adverse near-term impacts on economic performance; more importantly, they could hasten the start of monetary tightening by the Fed and other central banks. In any event, a slowing of the economy can be predicted when the stimulus is unwound, by 2014 or even earlier, so that great care needs to be taken in the pacing the withdrawal of fiscal stimulus and the high levels of liquidity that have been introduced into the system. That will be the real challenge once the economy has been returned to full employment.

References

- Adams, F. Gerard (2009) "Will Economic Recovery Drive Up World Oil Prices?" *World Economics* 10:2, 1-27.
- Adams, F. Gerard and Byron Gangnes (2009a) "Simulating Policy Alternatives for Economic Recovery in the United States," University of Hawaii mimeo, January 19, 2009.
- Adams, F. Gerard and Byron Gangnes (2009b) "Global Financial Crunch and Recession: a United States Perspective," University of Hawaii mimeo, September 5, 2009.
- Hamilton, James (2009) Testimony Prepared for the Joint Economic Committee of the US Congress, May 20,
Econbrowser.com http://www.econbrowser.com/archives/2009/05/Hamilton_JEC_2009_05_20.html
- IHS Global Insight (undated) "Global Insight model of the US economy," Lexington, Massachusetts.
- Loretan, Mico (2005) "Indexes of the Foreign Exchange Value of the Dollar," *Federal Reserve Bulletin*, winter. http://federalreserve.gov/pubs/bulletin/2005/winter05_index.pdf.

Appendix. Changing economic environment scenarios

Scenario A. Consumer recovery

The baseline global insight forecast describes a slow pace of recovery for American consumer demand. Real personal consumption expenditure rises 1.6% in 2010 and 2.3% in 2011. Considering the extent of consumption decline that has occurred, particularly for durable goods, a more rapid consumer rebound is possible. I simulate an alternative scenario where because of pent-up demand, recovery of stock market and housing wealth and improved sentiment, consumer spending rises more rapidly.

The combined effects of home and stock price recovery and a quick rebound of consumer confidence have only a limited impact on consumer spending. Auto demand in particular remains well below its previous peak level until the middle of the next decade. So I make the additional assumption that auto demand rebounds above 2007 levels by early 2011. As a result total real consumer spending rises 1.6% above baseline levels in 2010. Real GDP expands at a 3% rate in 2010, about 1% faster than in the baseline, and GDP growth averages 3.1% over the next four years. Unemployment remains stubbornly high, falling by just one-half percent below the baseline level.

Certainly a more vigorous rebound in consumer spending is possible, given the experience in past recovery periods. Weak consumption in the model simulations may in part reflect the sharp drop that has occurred in consumer behavior during the downturn, a change in spending propensity not captured by the model. A reversal of this development would bring a faster snap back of consumer spending.

It may be useful in passing to note that this moderate private-sector rebound generates considerable growth in government revenues, reducing the size of the Federal budget deficit by

about \$120 billion per year in 2012-2013 and slowing the growth of the debt/GDP ratio by nearly seven percentage points by 2019. Restoration of satisfactory private sector growth is clearly going to be important in controlling the burgeoning US public debt.

Scenario B. Return to record oil prices

In the baseline Global Insight forecast, the price of imported crude oil averages \$61 per barrel in 2010, \$71 in 2011 and remains below \$90 per barrel until 2016. In real terms, oil rises in cost about 20% by 2011 and 36% by 2019, but remains well below the peak levels experienced in the middle of 2008. I simulate the effect of an immediate doubling of oil prices to \$130 per barrel in the fourth quarter of 2009, climbing above \$160 in 2013 and to nearly \$190 by 2018. Throughout the forecast horizon, the oil price path remains above the historical high of \$116 per barrel (on a quarterly basis) reached in mid-2008.

As anticipated, the oil price surge has a very contractionary impact on the economy, pulling real GDP down 1.8% below baseline levels in 2010 and 2.5% in 2011. (World GDP is assumed to fall by the same proportion.) The unemployment rate rises by more than a percentage point compared with the baseline in 2011-2012, and does not fall below 9% until 2013. While there is a significant impact on prices in the short run the impact on inflation—CPI inflation spikes to 4.5% in the first half of 2010—this does not persist. Economic slowing reduces cost pressure, and by 2014 the inflation rate falls below the baseline path. (If the Federal Reserve were to accommodate the oil price shock, presumably the inflationary impact would be larger, although this presumably depends importantly on the extent to which inflationary expectations built up.) By the out years of the forecast horizon, falling prices and interest rates provide support for growth and the level of economic activity eventually exceeds

that of the baseline path.

It is unclear whether the model is really able to capture the effect of an oil price shock of this magnitude. Perhaps not. If oil prices surge to and remain at a level significantly above historical experience, it is likely that there will need to be adjustments on the production side that the model cannot predict. Whether that would happen at \$200 per barrel or \$300 per barrel is difficult to know.

Table 1. Summary of Alternative Scenario Paths

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2019 |
|---|------|------|------|------|------|------|
| Real GDP Growth | | | | | | |
| Baseline Forecast | 2.0 | 2.9 | 3.6 | 2.9 | 2.6 | 2.9 |
| <i>1. Persistent expansionary monetary policy</i> | 2.0 | 3.1 | 3.8 | 2.8 | 2.5 | 2.8 |
| <i>2. Significant additional fiscal stimulus</i> | 3.3 | 6.0 | 3.4 | 1.0 | 0.3 | 3.2 |
| <i>3. Combined fiscal & monetary stimulus</i> | 3.3 | 6.2 | 3.7 | 1.1 | 0.3 | 3.0 |
| <i>4. Coordinated foreign stimulus</i> | 2.5 | 3.6 | 4.1 | 3.4 | 2.8 | 3.0 |
| <i>5. Combined US and foreign stimulus</i> | 3.7 | 6.8 | 4.2 | 1.6 | 0.5 | 3.0 |
| <i>6. Early unwinding of monetary stimulus</i> | 2.0 | 2.5 | 3.2 | 2.6 | 2.7 | 3.2 |
| <i>7. Early US fiscal retrenchment</i> | 1.0 | 0.8 | 3.7 | 3.3 | 3.2 | 3.0 |
| Unemployment Rate | | | | | | |
| Baseline Forecast | 9.9 | 9.3 | 8.5 | 7.9 | 7.6 | 6.0 |
| <i>1. Persistent expansionary monetary policy</i> | 9.9 | 9.3 | 8.4 | 7.8 | 7.6 | 6.2 |
| <i>2. Significant additional fiscal stimulus</i> | 9.6 | 7.7 | 6.7 | 7.0 | 7.9 | 6.3 |
| <i>3. Combined fiscal & monetary stimulus</i> | 9.6 | 7.6 | 6.5 | 6.9 | 7.8 | 6.6 |
| <i>4. Coordinated foreign stimulus</i> | 9.7 | 8.9 | 7.8 | 7.0 | 6.5 | 5.2 |
| <i>5. Combined US and foreign stimulus</i> | 9.4 | 7.2 | 5.8 | 5.8 | 6.7 | 5.8 |
| <i>6. Early unwinding of monetary stimulus</i> | 9.9 | 9.5 | 8.8 | 8.3 | 7.9 | 5.5 |
| <i>7. Early US fiscal retrenchment</i> | 10.2 | 10.6 | 10.1 | 9.3 | 8.7 | 6.5 |
| Consumer Price Inflation | | | | | | |
| Baseline Forecast | 1.3 | 2.2 | 2.1 | 1.9 | 1.9 | 1.8 |
| <i>1. Persistent expansionary monetary policy</i> | 1.3 | 2.3 | 2.1 | 1.9 | 1.9 | 1.7 |
| <i>2. Significant additional fiscal stimulus</i> | 1.3 | 2.5 | 2.4 | 2.3 | 2.5 | 1.9 |
| <i>3. Combined fiscal & monetary stimulus</i> | 1.3 | 2.5 | 2.5 | 2.2 | 2.5 | 1.8 |
| <i>4. Coordinated foreign stimulus</i> | 1.4 | 2.4 | 2.4 | 2.4 | 2.6 | 3.4 |
| <i>5. Combined US and foreign stimulus</i> | 1.4 | 2.7 | 2.8 | 2.7 | 3.2 | 3.3 |
| <i>6. Early unwinding of monetary stimulus</i> | 1.3 | 2.2 | 2.0 | 1.8 | 1.8 | 1.8 |
| <i>7. Early US fiscal retrenchment</i> | 1.3 | 2.1 | 1.6 | 1.2 | 0.9 | 0.1 |

Table 1. Summary of Alternative Scenario Paths (cntd)

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2019 |
|---|------|------|------|------|------|------|
| Current Account Balance as % of GDP | | | | | | |
| Baseline Forecast | -3.8 | -4.2 | -4.4 | -4.2 | -3.9 | -2.3 |
| <i>1. Persistent expansionary monetary policy</i> | -3.8 | -4.1 | -4.3 | -3.9 | -3.7 | -2.5 |
| <i>2. Significant additional fiscal stimulus</i> | -4.0 | -5.1 | -5.3 | -4.7 | -4.0 | -1.9 |
| <i>3. Combined fiscal & monetary stimulus</i> | -4.0 | -5.0 | -5.0 | -4.3 | -3.7 | -2.1 |
| <i>4. Coordinated foreign stimulus</i> | -3.7 | -3.8 | -3.7 | -3.2 | -2.7 | -0.4 |
| <i>5. Combined US and foreign stimulus</i> | -3.8 | -4.6 | -4.4 | -3.4 | -2.6 | 0.0 |
| <i>6. Early unwinding of monetary stimulus</i> | -3.9 | -4.3 | -4.8 | -4.6 | -4.4 | -2.1 |
| <i>7. Early US fiscal retrenchment</i> | -3.7 | -3.5 | -3.8 | -3.5 | -3.3 | -2.7 |
| Federal Publicly Held Debt as % of GDP | | | | | | |
| Baseline Forecast | 61.3 | 65.7 | 67.8 | 69.1 | 70.1 | 76.4 |
| <i>1. Persistent expansionary monetary policy</i> | 61.3 | 65.4 | 66.8 | 67.2 | 67.4 | 73.8 |
| <i>2. Significant additional fiscal stimulus</i> | 60.8 | 63.9 | 66.2 | 68.4 | 71.0 | 80.6 |
| <i>3. Combined fiscal & monetary stimulus</i> | 60.8 | 63.7 | 65.0 | 66.1 | 67.5 | 76.4 |
| <i>4. Coordinated foreign stimulus</i> | 61.0 | 64.5 | 65.5 | 65.3 | 64.7 | 64.6 |
| <i>5. Combined US and foreign stimulus</i> | 60.5 | 62.6 | 62.8 | 62.4 | 62 | 63.6 |
| <i>6. Early unwinding of monetary stimulus</i> | 61.4 | 66.3 | 69.6 | 72.6 | 75.2 | 81.7 |
| <i>7. Early US fiscal retrenchment</i> | 61.8 | 66.5 | 68.1 | 68.6 | 68.5 | 69.6 |

Table 2. Persistent Expansionary Monetary Policy

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---------------------------------|-------|------|------|------|------|------|------|------|------|------|------|
| Solution | | | | | | | | | | | |
| Real GDP Growth | -2.5 | 2.0 | 3.1 | 3.8 | 2.8 | 2.5 | 2.4 | 2.4 | 2.5 | 2.7 | 2.8 |
| Unemployment Rate | 9.2 | 9.9 | 9.3 | 8.4 | 7.8 | 7.6 | 7.4 | 7.2 | 7.0 | 6.6 | 6.2 |
| CPI Inflation Rate (yr-yr) | -0.5 | 1.3 | 2.3 | 2.1 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.8 | 1.7 |
| Current Account as % of GDP | -3.1 | -3.8 | -4.1 | -4.3 | -3.9 | -3.7 | -3.5 | -3.4 | -3.0 | -2.8 | -2.5 |
| Federal Budget Surp as % of GDP | -11.4 | -8.7 | -6.0 | -4.4 | -2.9 | -3.2 | -3.7 | -4.2 | -4.5 | -4.7 | -4.8 |
| Publicly-held debt as % of GDP | 52.5 | 61.3 | 65.4 | 66.8 | 67.2 | 67.4 | 68.1 | 69.3 | 70.7 | 72.2 | 73.8 |
| Difference | | | | | | | | | | | |
| Real GDP Growth | 0.0 | 0.0 | 0.2 | 0.2 | 0.0 | -0.1 | -0.2 | -0.1 | 0.0 | 0.0 | -0.1 |
| Unemployment Rate | 0.0 | 0.0 | 0.0 | -0.1 | -0.1 | -0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 |
| CPI Inflation (yr-yr) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | -0.1 |
| Current Account as % of GDP | 0.0 | 0.0 | 0.1 | 0.2 | 0.3 | 0.2 | 0.1 | 0.0 | -0.1 | -0.1 | -0.2 |
| Federal Surplus as % of GDP | 0.0 | 0.0 | 0.3 | 0.8 | 1.0 | 1.0 | 0.7 | 0.1 | -0.1 | -0.1 | 0.0 |
| Publ held debt as % of GDP | 0.0 | 0.0 | -0.2 | -1.0 | -1.8 | -2.7 | -3.2 | -3.4 | -3.2 | -2.9 | -2.6 |
| Percent Difference | | | | | | | | | | | |
| Real GDP | 0.0 | 0.0 | 0.2 | 0.4 | 0.3 | 0.3 | 0.1 | 0.0 | 0.0 | 0.0 | -0.1 |
| Consumption | 0.0 | 0.0 | 0.1 | 0.0 | -0.2 | -0.5 | -0.6 | -0.5 | -0.3 | -0.2 | -0.2 |
| Durables | 0.0 | 0.0 | 0.8 | 1.0 | 0.3 | -0.4 | -0.9 | -1.1 | -0.7 | -0.5 | -0.6 |
| Nondurables | 0.0 | 0.0 | -0.1 | -0.2 | -0.4 | -0.6 | -0.6 | -0.5 | -0.3 | -0.2 | -0.2 |
| Services | 0.0 | 0.0 | 0.0 | -0.1 | -0.3 | -0.5 | -0.6 | -0.5 | -0.3 | -0.2 | -0.2 |
| Nonresid. Fixed Investment | 0.0 | 0.0 | 0.4 | 1.3 | 1.6 | 1.8 | 1.5 | 0.9 | 0.4 | 0.2 | -0.2 |
| Equip and Software | 0.0 | 0.0 | 0.6 | 1.8 | 1.9 | 2.1 | 1.8 | 1.1 | 0.6 | 0.2 | -0.3 |
| Structures | 0.0 | 0.0 | 0.0 | 0.1 | 0.7 | 1.0 | 0.7 | 0.3 | 0.0 | -0.2 | -0.3 |
| Residential Fixed Investment | 0.0 | 0.0 | 2.5 | 5.2 | 4.8 | 3.5 | 1.4 | -0.7 | -0.9 | -0.4 | -0.2 |
| Net Exports | | | | | | | | | | | |
| Exports | 0.0 | 0.0 | 0.0 | 0.3 | 0.7 | 1.1 | 1.2 | 1.2 | 0.9 | 0.6 | 0.2 |
| Imports | 0.0 | 0.0 | 0.3 | 0.5 | 0.0 | -0.3 | -0.6 | -0.7 | -0.4 | -0.3 | -0.4 |
| Federal Government | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| State and Local Government | 0.0 | 0.0 | 0.0 | 0.2 | 0.4 | 0.4 | 0.2 | 0.0 | -0.2 | -0.2 | -0.2 |
| Employment | 0.0 | 0.0 | 0.1 | 0.2 | 0.3 | 0.2 | 0.0 | -0.2 | -0.3 | -0.3 | -0.3 |
| Consumer Prices | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -0.1 | -0.1 | -0.2 |
| Major Currency Exch Rate | 0.0 | 0.0 | -0.2 | -1.0 | -2.0 | -2.7 | -2.9 | -2.5 | -1.7 | -0.9 | -0.1 |
| Other Imp Trade P. Exch Rate | 0.0 | 0.0 | -0.1 | -0.4 | -0.7 | -0.9 | -1.0 | -0.8 | -0.5 | -0.1 | 0.4 |

Table 3. Significant additional US fiscal stimulus

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---------------------------------|-------|------|------|------|------|------|------|------|------|------|------|
| Solution | | | | | | | | | | | |
| Real GDP Growth | -2.5 | 3.3 | 6.0 | 3.4 | 1.0 | 0.3 | 1.5 | 2.6 | 2.7 | 2.9 | 3.2 |
| Unemployment Rate | 9.2 | 9.6 | 7.7 | 6.7 | 7.0 | 7.9 | 8.3 | 8.0 | 7.5 | 7.0 | 6.3 |
| CPI Inflation Rate (yr-yr) | -0.5 | 1.3 | 2.5 | 2.4 | 2.3 | 2.5 | 2.6 | 2.5 | 2.3 | 2.1 | 1.9 |
| Current Account as % of GDP | -3.1 | -4.0 | -5.1 | -5.3 | -4.7 | -4.0 | -3.6 | -3.4 | -2.9 | -2.3 | -1.9 |
| Federal Budget Surp as % of GDP | -11.4 | -9.3 | -6.8 | -5.1 | -4.2 | -5.0 | -5.9 | -5.9 | -5.4 | -5.0 | -4.9 |
| Publicly-held debt as % of GDP | 52.5 | 60.8 | 63.9 | 66.2 | 68.4 | 71.0 | 73.8 | 76.2 | 78.3 | 79.6 | 80.6 |
| Difference | | | | | | | | | | | |
| Real GDP Growth | 0.0 | 1.2 | 3.1 | -0.2 | -1.8 | -2.3 | -1.0 | 0.1 | 0.2 | 0.2 | 0.3 |
| Unemployment Rate | 0.0 | -0.3 | -1.6 | -1.9 | -0.9 | 0.3 | 0.9 | 0.9 | 0.7 | 0.5 | 0.3 |
| CPI Inflation (yr-yr) | 0.0 | 0.0 | 0.3 | 0.4 | 0.4 | 0.6 | 0.7 | 0.6 | 0.4 | 0.2 | 0.1 |
| Current Account as % of GDP | 0.0 | -0.2 | -0.9 | -0.9 | -0.5 | -0.1 | 0.0 | 0.0 | 0.1 | 0.3 | 0.4 |
| Federal Surplus as % of GDP | 0.0 | -0.6 | -0.5 | 0.1 | -0.2 | -0.8 | -1.6 | -1.6 | -1.0 | -0.4 | -0.1 |
| Publ held debt as % of GDP | 0.0 | -0.5 | -1.7 | -1.6 | -0.6 | 1.0 | 2.4 | 3.6 | 4.3 | 4.5 | 4.3 |
| Percent Difference | | | | | | | | | | | |
| Real GDP | 0.0 | 1.2 | 4.3 | 4.1 | 2.2 | 0.0 | -1.0 | -0.9 | -0.7 | -0.5 | -0.2 |
| Consumption | 0.0 | 0.5 | 2.7 | 3.4 | 2.4 | 0.7 | -0.3 | -0.5 | -0.6 | -0.7 | -0.6 |
| Durables | 0.0 | 1.4 | 5.6 | 5.7 | 3.5 | 0.1 | -1.5 | -1.4 | -1.7 | -1.8 | -1.4 |
| Nondurables | 0.0 | 0.3 | 1.9 | 2.6 | 2.0 | 0.8 | 0.0 | -0.2 | -0.3 | -0.5 | -0.5 |
| Services | 0.0 | 0.4 | 2.5 | 3.2 | 2.4 | 0.8 | -0.3 | -0.5 | -0.6 | -0.7 | -0.6 |
| Nonresid. Fixed Investment | 0.0 | 1.8 | 13.0 | 12.9 | 6.4 | -0.1 | -2.9 | -1.9 | -0.9 | -0.3 | 0.2 |
| Equip and Software | 0.0 | 2.5 | 16.2 | 15.7 | 8.1 | 1.1 | -2.1 | -1.3 | -0.8 | -0.5 | -0.1 |
| Structures | 0.0 | 0.0 | 4.0 | 5.2 | 1.8 | -3.5 | -5.6 | -3.9 | -1.9 | -0.8 | -0.1 |
| Residential Fixed Investment | 0.0 | 0.6 | 2.6 | 3.3 | 1.8 | -2.1 | -5.1 | -5.8 | -5.1 | -3.7 | -2.4 |
| Net Exports | | | | | | | | | | | |
| Exports | 0.0 | 0.0 | 0.8 | 0.7 | -0.2 | -1.0 | -1.2 | -0.5 | 0.3 | 1.1 | 1.7 |
| Imports | 0.0 | 1.5 | 7.7 | 7.7 | 4.5 | 0.9 | -0.9 | -0.6 | -0.4 | -0.4 | -0.1 |
| Federal Government | 0.0 | 5.8 | 12.3 | 9.2 | 4.4 | 0.7 | 0.6 | 0.6 | 0.5 | 0.5 | 0.5 |
| State and Local Government | 0.0 | 2.1 | 5.7 | 6.2 | 3.8 | 0.5 | -1.2 | -1.6 | -1.3 | -0.9 | -0.6 |
| Employment | 0.0 | 0.4 | 2.4 | 3.1 | 2.0 | 0.0 | -1.3 | -1.6 | -1.3 | -1.0 | -0.7 |
| Consumer Prices | 0.0 | 0.0 | 0.3 | 0.7 | 1.0 | 1.6 | 2.3 | 2.9 | 3.2 | 3.4 | 3.6 |
| Major Currency Exch Rate | 0.0 | 0.0 | 0.0 | -0.6 | -1.3 | -2.3 | -3.6 | -5.0 | -6.5 | -7.4 | -7.6 |
| Other Imp Trade P Exch Rate | 0.0 | -0.1 | -0.6 | 0.1 | 1.2 | 0.9 | -0.4 | -2.2 | -3.7 | -4.8 | -5.4 |

Table 4. Significant additional US fiscal and monetary stimulus

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---------------------------------|-------|------|------|------|------|------|------|------|------|------|------|
| Solution | | | | | | | | | | | |
| Real GDP Growth | -2.5 | 3.3 | 6.2 | 3.7 | 1.1 | 0.3 | 1.4 | 2.5 | 2.7 | 2.9 | 3.0 |
| Unemployment Rate | 9.2 | 9.6 | 7.6 | 6.5 | 6.9 | 7.8 | 8.3 | 8.1 | 7.7 | 7.2 | 6.6 |
| CPI Inflation Rate (yr-yr) | -0.5 | 1.3 | 2.5 | 2.5 | 2.2 | 2.5 | 2.6 | 2.5 | 2.2 | 2.0 | 1.8 |
| Current Account as % of GDP | -3.1 | -4.0 | -5.0 | -5.0 | -4.3 | -3.7 | -3.4 | -3.4 | -2.9 | -2.5 | -2.1 |
| Federal Budget Surp as % of GDP | -11.4 | -9.3 | -6.5 | -4.1 | -2.8 | -3.7 | -4.9 | -5.5 | -5.3 | -4.9 | -4.7 |
| Publicly-held debt as % of GDP | 52.5 | 60.8 | 63.7 | 65.0 | 66.1 | 67.5 | 69.4 | 71.4 | 73.5 | 75.1 | 76.4 |
| Difference | | | | | | | | | | | |
| Real GDP Growth | 0.0 | 1.3 | 3.3 | 0.1 | -1.8 | -2.3 | -1.1 | 0.0 | 0.2 | 0.1 | 0.1 |
| Unemployment Rate | 0.0 | -0.3 | -1.7 | -2.0 | -1.1 | 0.2 | 1.0 | 1.1 | 0.9 | 0.7 | 0.6 |
| CPI Inflation (yr-yr) | 0.0 | 0.0 | 0.3 | 0.4 | 0.3 | 0.6 | 0.7 | 0.6 | 0.3 | 0.1 | 0.0 |
| Current Account as % of GDP | 0.0 | -0.2 | -0.8 | -0.6 | -0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.2 | 0.3 |
| Federal Surplus as % of GDP | 0.0 | -0.6 | -0.2 | 1.1 | 1.1 | 0.5 | -0.6 | -1.2 | -0.9 | -0.3 | 0.1 |
| Publ held debt as % of GDP | 0.0 | -0.5 | -2.0 | -2.8 | -2.9 | -2.6 | -2.0 | -1.2 | -0.4 | 0.0 | 0.0 |
| Percent Difference | | | | | | | | | | | |
| Real GDP | 0.0 | 1.2 | 4.5 | 4.5 | 2.7 | 0.4 | -0.7 | -0.8 | -0.6 | -0.5 | -0.4 |
| Consumption | 0.0 | 0.5 | 2.7 | 3.3 | 2.1 | 0.2 | -1.0 | -1.2 | -1.1 | -1.2 | -1.2 |
| Durables | 0.0 | 1.5 | 6.5 | 6.9 | 4.0 | -0.2 | -2.5 | -2.6 | -2.5 | -2.6 | -2.7 |
| Nondurables | 0.0 | 0.3 | 1.8 | 2.3 | 1.5 | 0.1 | -0.8 | -0.9 | -0.9 | -0.9 | -1.0 |
| Services | 0.0 | 0.4 | 2.5 | 3.1 | 2.0 | 0.2 | -1.0 | -1.1 | -1.0 | -1.1 | -1.1 |
| Nonresid. Fixed Investment | 0.0 | 1.8 | 13.5 | 14.6 | 8.6 | 2.5 | -0.6 | -0.3 | 0.2 | 0.3 | 0.2 |
| Equip and Software | 0.0 | 2.5 | 16.9 | 18.0 | 10.7 | 4.2 | 0.9 | 0.7 | 0.6 | 0.3 | 0.0 |
| Structures | 0.0 | 0.0 | 4.0 | 5.4 | 2.7 | -2.3 | -4.8 | -3.4 | -1.7 | -0.9 | -0.3 |
| Residential Fixed Investment | 0.0 | 0.6 | 5.6 | 9.7 | 8.6 | 3.3 | -2.2 | -5.3 | -5.1 | -3.4 | -2.2 |
| Net Exports | | | | | | | | | | | |
| Exports | 0.0 | 0.0 | 0.9 | 1.1 | 0.7 | 0.3 | 0.5 | 1.1 | 1.8 | 2.3 | 2.4 |
| Imports | 0.0 | 1.5 | 8.0 | 8.3 | 4.6 | 0.5 | -1.6 | -1.3 | -1.0 | -0.9 | -0.9 |
| Federal Government | 0.0 | 5.8 | 12.3 | 9.2 | 4.4 | 0.7 | 0.6 | 0.6 | 0.5 | 0.5 | 0.5 |
| State and Local Government | 0.0 | 2.1 | 5.7 | 6.5 | 4.3 | 1.0 | -0.9 | -1.7 | -1.6 | -1.3 | -1.0 |
| Employment | 0.0 | 0.4 | 2.5 | 3.4 | 2.3 | 0.3 | -1.2 | -1.7 | -1.6 | -1.3 | -1.1 |
| Consumer Prices | 0.0 | 0.0 | 0.3 | 0.7 | 1.0 | 1.6 | 2.3 | 2.8 | 3.2 | 3.3 | 3.3 |
| Major Currency Exch Rate | 0.0 | 0.0 | -0.3 | -1.8 | -3.8 | -5.7 | -7.4 | -8.5 | -9.2 | -9.3 | -8.7 |
| Other Imp Trade P. Exch Rate | 0.0 | -0.1 | -0.7 | -0.4 | 0.3 | -0.2 | -1.7 | -3.3 | -4.5 | -5.2 | -5.4 |

Table 5. Coordinated foreign stimulus

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---------------------------------|-------|------|------|------|------|------|------|------|-------|-------|-------|
| Solution | | | | | | | | | | | |
| Real GDP Growth | -2.5 | 2.5 | 3.6 | 4.1 | 3.4 | 2.8 | 2.4 | 2.3 | 2.4 | 2.7 | 3.0 |
| Unemployment Rate | 9.2 | 9.7 | 8.9 | 7.8 | 7.0 | 6.5 | 6.3 | 6.1 | 5.9 | 5.6 | 5.2 |
| CPI Inflation Rate (yr-yr) | -0.5 | 1.4 | 2.4 | 2.4 | 2.4 | 2.6 | 2.8 | 3.0 | 3.2 | 3.3 | 3.4 |
| Current Account as % of GDP | -3.1 | -3.7 | -3.8 | -3.7 | -3.2 | -2.7 | -2.3 | -2.0 | -1.4 | -0.9 | -0.4 |
| Federal Budget Surp as % of GDP | -11.4 | -8.6 | -5.8 | -4.4 | -2.9 | -2.9 | -3.2 | -3.4 | -3.6 | -3.8 | -4.0 |
| Publicly-held debt as % of GDP | 52.5 | 61.0 | 64.5 | 65.5 | 65.3 | 64.7 | 64.6 | 64.6 | 64.7 | 64.7 | 64.6 |
| Difference | | | | | | | | | | | |
| Real GDP Growth | 0.0 | 0.4 | 0.7 | 0.5 | 0.5 | 0.2 | -0.1 | -0.2 | -0.1 | 0.0 | 0.0 |
| Unemployment Rate | 0.0 | -0.1 | -0.4 | -0.7 | -1.0 | -1.1 | -1.1 | -1.0 | -0.9 | -0.8 | -0.8 |
| CPI Inflation (yr-yr) | 0.0 | 0.1 | 0.2 | 0.3 | 0.5 | 0.7 | 0.9 | 1.1 | 1.3 | 1.4 | 1.6 |
| Current Account as % of GDP | 0.0 | 0.2 | 0.4 | 0.7 | 1.0 | 1.2 | 1.3 | 1.4 | 1.6 | 1.7 | 2.0 |
| Federal Surplus as % of GDP | 0.0 | 0.2 | 0.5 | 0.8 | 1.1 | 1.2 | 1.1 | 0.9 | 0.8 | 0.7 | 0.8 |
| Publ held debt as % of GDP | 0.0 | -0.3 | -1.1 | -2.3 | -3.8 | -5.3 | -6.8 | -8.1 | -9.3 | -10.4 | -11.7 |
| Percent Difference | | | | | | | | | | | |
| Real GDP | 0.0 | 0.4 | 1.1 | 1.6 | 2.1 | 2.3 | 2.2 | 2.0 | 1.9 | 1.8 | 1.9 |
| Consumption | 0.0 | 0.1 | 0.3 | 0.6 | 0.7 | 0.8 | 0.7 | 0.5 | 0.3 | 0.1 | -0.1 |
| Durables | 0.0 | 0.2 | 0.5 | 0.8 | 1.1 | 1.2 | 0.8 | 0.4 | -0.1 | -0.5 | -0.9 |
| Nondurables | 0.0 | 0.0 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.0 | -0.2 | -0.3 | -0.5 |
| Services | 0.0 | 0.1 | 0.4 | 0.6 | 0.8 | 0.9 | 0.8 | 0.6 | 0.4 | 0.2 | 0.1 |
| Nonresid. Fixed Investment | 0.0 | 0.4 | 1.5 | 2.1 | 2.4 | 2.6 | 2.0 | 1.5 | 1.2 | 1.2 | 1.3 |
| Equip and Software | 0.0 | 0.6 | 1.6 | 2.2 | 2.5 | 2.6 | 2.2 | 1.8 | 1.7 | 1.7 | 1.8 |
| Structures | 0.0 | 0.0 | 1.0 | 1.8 | 2.2 | 2.4 | 1.7 | 0.8 | 0.2 | -0.1 | -0.2 |
| Residential Fixed Investment | 0.0 | 0.2 | 0.6 | 0.9 | 1.3 | 1.4 | 1.1 | 0.1 | -1.0 | -2.0 | -2.7 |
| Net Exports | | | | | | | | | | | |
| Exports | 0.1 | 2.7 | 5.9 | 8.6 | 11.0 | 11.9 | 12.0 | 12.0 | 12.2 | 12.7 | 13.5 |
| Imports | 0.0 | 0.3 | 1.0 | 1.5 | 2.1 | 2.5 | 2.4 | 2.3 | 2.2 | 2.3 | 2.5 |
| Federal Government | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| State and Local Government | 0.0 | 0.0 | 0.2 | 0.5 | 0.7 | 0.9 | 0.9 | 0.8 | 0.6 | 0.5 | 0.5 |
| Employment | 0.0 | 0.2 | 0.7 | 1.2 | 1.6 | 1.9 | 1.9 | 1.7 | 1.5 | 1.4 | 1.4 |
| Consumer Prices | 0.0 | 0.1 | 0.3 | 0.6 | 1.1 | 1.7 | 2.6 | 3.7 | 5.0 | 6.4 | 8.1 |
| Major Currency Exch Rate | 0.0 | 0.1 | 0.4 | 0.8 | 1.1 | 1.1 | 0.4 | -0.9 | -3.0 | -5.7 | -8.9 |
| Other Imp Trade P. Exch Rate | -0.3 | -3.0 | -5.1 | -6.7 | -8.2 | -8.6 | -9.0 | -9.8 | -11.1 | -12.8 | -14.8 |

Table 6. Combined US and foreign stimulus

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---------------------------------|-------|------|------|------|------|------|-------|-------|-------|-------|-------|
| Solution | | | | | | | | | | | |
| Real GDP Growth | -2.5 | 3.7 | 6.8 | 4.2 | 1.6 | 0.5 | 1.3 | 2.3 | 2.5 | 2.8 | 3.0 |
| Unemployment Rate | 9.2 | 9.4 | 7.2 | 5.8 | 5.8 | 6.7 | 7.2 | 7.2 | 6.8 | 6.4 | 5.8 |
| CPI Inflation Rate (yr-yr) | -0.5 | 1.4 | 2.7 | 2.8 | 2.7 | 3.2 | 3.4 | 3.6 | 3.5 | 3.4 | 3.3 |
| Current Account as % of GDP | -3.1 | -3.8 | -4.6 | -4.4 | -3.4 | -2.6 | -2.0 | -1.9 | -1.3 | -0.7 | 0.0 |
| Federal Budget Surp as % of GDP | -11.4 | -9.2 | -6.0 | -3.3 | -1.7 | -2.4 | -3.7 | -4.4 | -4.3 | -3.8 | -3.5 |
| Publicly-held debt as % of GDP | 52.5 | 60.5 | 62.6 | 62.8 | 62.4 | 62.0 | 62.4 | 63.1 | 63.8 | 63.9 | 63.6 |
| Difference | | | | | | | | | | | |
| Real GDP Growth | 0.0 | 1.7 | 3.9 | 0.6 | -1.3 | -2.1 | -1.2 | -0.2 | 0.1 | 0.1 | 0.1 |
| Unemployment Rate | 0.0 | -0.5 | -2.1 | -2.8 | -2.1 | -1.0 | -0.1 | 0.1 | 0.0 | -0.1 | -0.2 |
| CPI Inflation (yr-yr) | 0.0 | 0.1 | 0.5 | 0.7 | 0.8 | 1.2 | 1.6 | 1.6 | 1.6 | 1.5 | 1.5 |
| Current Account as % of GDP | 0.0 | 0.0 | -0.4 | 0.0 | 0.7 | 1.4 | 1.6 | 1.5 | 1.7 | 2.0 | 2.3 |
| Federal Surplus as % of GDP | 0.0 | -0.5 | 0.3 | 1.9 | 2.3 | 1.8 | 0.6 | -0.1 | 0.2 | 0.8 | 1.4 |
| Publ held debt as % of GDP | 0.0 | -0.8 | -3.1 | -5.0 | -6.7 | -8.0 | -9.0 | -9.6 | -10.1 | -11.2 | -12.8 |
| Percent Difference | | | | | | | | | | | |
| Real GDP | 0.0 | 1.7 | 5.6 | 6.2 | 4.9 | 2.7 | 1.5 | 1.3 | 1.4 | 1.5 | 1.6 |
| Consumption | 0.0 | 0.6 | 3.1 | 3.9 | 2.8 | 0.9 | -0.4 | -0.7 | -0.9 | -1.2 | -1.6 |
| Durables | 0.0 | 1.7 | 7.2 | 8.0 | 5.4 | 1.1 | -1.6 | -2.2 | -2.5 | -3.0 | -3.6 |
| Nondurables | 0.0 | 0.3 | 1.9 | 2.5 | 1.7 | 0.3 | -0.7 | -0.9 | -1.1 | -1.4 | -1.7 |
| Services | 0.0 | 0.6 | 2.9 | 3.7 | 2.8 | 1.1 | -0.2 | -0.5 | -0.7 | -1.0 | -1.3 |
| Nonresid. Fixed Investment | 0.0 | 2.2 | 15.0 | 16.7 | 11.2 | 5.3 | 1.9 | 1.8 | 2.2 | 2.4 | 2.5 |
| Equip and Software | 0.0 | 3.0 | 18.6 | 20.2 | 13.4 | 7.1 | 3.6 | 3.3 | 3.3 | 3.3 | 3.1 |
| Structures | 0.0 | -0.1 | 5.1 | 7.3 | 5.2 | 0.3 | -3.0 | -2.6 | -1.5 | -0.9 | -0.4 |
| Residential Fixed Investment | 0.0 | 0.9 | 6.2 | 11.0 | 10.8 | 5.6 | -0.5 | -4.3 | -4.8 | -3.8 | -3.0 |
| Net Exports | | | | | | | | | | | |
| Exports | 0.1 | 2.7 | 6.7 | 9.8 | 11.9 | 12.4 | 12.6 | 13.3 | 14.2 | 15.3 | 16.5 |
| Imports | 0.0 | 1.8 | 9.0 | 9.9 | 6.7 | 3.0 | 0.8 | 1.0 | 1.4 | 1.6 | 1.6 |
| Federal Government | 0.0 | 5.8 | 12.3 | 9.2 | 4.4 | 0.7 | 0.6 | 0.6 | 0.6 | 0.5 | 0.5 |
| State and Local Government | 0.0 | 2.1 | 5.9 | 7.1 | 5.1 | 2.0 | 0.0 | -1.0 | -1.0 | -0.9 | -0.6 |
| Employment | 0.0 | 0.7 | 3.2 | 4.6 | 4.0 | 2.2 | 0.7 | 0.0 | 0.0 | 0.2 | 0.3 |
| Consumer Prices | 0.0 | 0.1 | 0.6 | 1.3 | 2.1 | 3.3 | 4.9 | 6.6 | 8.2 | 9.8 | 11.5 |
| Major Currency Exch Rate | 0.0 | 0.1 | 0.1 | -1.2 | -2.9 | -5.0 | -7.3 | -9.7 | -12.4 | -15.2 | -17.9 |
| Other Imp Trade P Exch Rate | -0.3 | -3.1 | -5.8 | -7.1 | -8.0 | -8.8 | -10.5 | -12.7 | -14.9 | -17.0 | -19.2 |

Table 7. Early unwinding of US monetary stimulus

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---------------------------------|-------|------|------|------|------|------|------|------|------|------|------|
| Solution | | | | | | | | | | | |
| Real GDP Growth | -2.5 | 2.0 | 2.5 | 3.2 | 2.6 | 2.7 | 2.8 | 2.9 | 2.7 | 2.9 | 3.2 |
| Unemployment Rate | 9.2 | 9.9 | 9.5 | 8.8 | 8.3 | 7.9 | 7.4 | 6.9 | 6.5 | 6.1 | 5.5 |
| CPI Inflation Rate (yr-yr) | -0.5 | 1.3 | 2.2 | 2.0 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.8 |
| Current Account as % of GDP | -3.1 | -3.9 | -4.3 | -4.8 | -4.6 | -4.4 | -3.9 | -3.4 | -2.9 | -2.4 | -2.1 |
| Federal Budget Surp as % of GDP | -11.4 | -8.8 | -6.9 | -6.4 | -5.8 | -6.0 | -5.6 | -4.8 | -4.4 | -4.5 | -4.9 |
| Publicly-held debt as % of GDP | 52.5 | 61.4 | 66.3 | 69.6 | 72.6 | 75.2 | 77.7 | 79.2 | 80.3 | 81.0 | 81.7 |
| Difference | | | | | | | | | | | |
| Real GDP Growth | 0.0 | -0.1 | -0.4 | -0.3 | -0.2 | 0.1 | 0.3 | 0.4 | 0.2 | 0.1 | 0.3 |
| Unemployment Rate | 0.0 | 0.0 | 0.2 | 0.3 | 0.4 | 0.3 | 0.1 | -0.2 | -0.3 | -0.4 | -0.5 |
| CPI Inflation (yr-yr) | 0.0 | 0.0 | 0.0 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | 0.0 | 0.1 |
| Current Account as % of GDP | 0.0 | -0.1 | -0.2 | -0.4 | -0.5 | -0.5 | -0.3 | 0.0 | 0.1 | 0.2 | 0.2 |
| Federal Surplus as % of GDP | 0.0 | -0.1 | -0.6 | -1.3 | -1.8 | -1.8 | -1.3 | -0.5 | 0.1 | 0.1 | -0.1 |
| Publ held debt as % of GDP | 0.0 | 0.0 | 0.6 | 1.8 | 3.5 | 5.1 | 6.3 | 6.6 | 6.3 | 5.9 | 5.4 |
| Percent Difference | | | | | | | | | | | |
| Real GDP | 0.0 | 0.0 | -0.4 | -0.8 | -1.0 | -0.9 | -0.6 | -0.2 | 0.0 | 0.2 | 0.5 |
| Consumption | 0.0 | 0.0 | -0.2 | -0.2 | 0.0 | 0.3 | 0.7 | 0.8 | 0.8 | 0.8 | 1.0 |
| Durables | 0.0 | -0.3 | -1.1 | -1.5 | -1.0 | -0.1 | 1.0 | 1.8 | 1.8 | 1.9 | 2.4 |
| Nondurables | 0.0 | 0.0 | 0.0 | 0.2 | 0.3 | 0.6 | 0.8 | 0.8 | 0.7 | 0.7 | 0.8 |
| Services | 0.0 | 0.0 | -0.1 | -0.1 | 0.1 | 0.3 | 0.6 | 0.7 | 0.7 | 0.7 | 0.9 |
| Nonresid. Fixed Investment | 0.0 | -0.1 | -1.3 | -2.6 | -4.0 | -4.1 | -3.5 | -2.0 | -0.7 | -0.1 | 0.6 |
| Equip and Software | 0.0 | -0.2 | -1.7 | -3.2 | -4.8 | -4.8 | -4.0 | -2.3 | -0.9 | -0.2 | 0.7 |
| Structures | 0.0 | 0.1 | -0.1 | -0.7 | -2.0 | -2.4 | -2.0 | -0.9 | 0.0 | 0.6 | 0.9 |
| Residential Fixed Investment | 0.0 | -0.9 | -5.4 | -8.6 | -9.6 | -7.5 | -4.3 | -0.3 | 1.4 | 1.3 | 1.4 |
| Net Exports | | | | | | | | | | | |
| Exports | 0.0 | 0.0 | -0.2 | -0.7 | -1.5 | -2.2 | -2.6 | -2.6 | -2.3 | -1.9 | -1.4 |
| Imports | 0.0 | -0.1 | -0.7 | -0.9 | -0.8 | -0.2 | 0.4 | 1.0 | 1.1 | 1.1 | 1.5 |
| Federal Government | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| State and Local Government | 0.0 | 0.0 | -0.1 | -0.4 | -0.7 | -0.7 | -0.4 | 0.0 | 0.4 | 0.6 | 0.7 |
| Employment | 0.0 | 0.0 | -0.2 | -0.5 | -0.7 | -0.6 | -0.3 | 0.1 | 0.5 | 0.6 | 0.8 |
| Consumer Prices | 0.0 | 0.0 | 0.0 | -0.1 | -0.1 | -0.2 | -0.3 | -0.4 | -0.5 | -0.5 | -0.5 |
| Major Currency Exch Rate | 0.0 | 0.0 | 0.7 | 2.2 | 4.2 | 6.1 | 7.0 | 6.8 | 5.8 | 4.5 | 3.1 |
| Other Imp Trade P Exch Rate | 0.0 | 0.0 | 0.3 | 0.9 | 1.6 | 2.3 | 2.7 | 2.7 | 2.4 | 1.9 | 1.3 |

Table 8. Early US fiscal retrenchment

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---------------------------------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Solution | | | | | | | | | | | |
| Real GDP Growth | -2.5 | 1.0 | 0.8 | 3.7 | 3.3 | 3.2 | 3.0 | 2.7 | 2.8 | 2.9 | 3.0 |
| Unemployment Rate | 9.2 | 10.2 | 10.6 | 10.1 | 9.3 | 8.7 | 8.1 | 7.7 | 7.3 | 6.9 | 6.5 |
| CPI Inflation Rate (yr-yr) | -0.5 | 1.3 | 2.1 | 1.6 | 1.2 | 0.9 | 0.7 | 0.6 | 0.4 | 0.3 | 0.1 |
| Current Account as % of GDP | -3.1 | -3.7 | -3.5 | -3.8 | -3.5 | -3.3 | -3.1 | -3.0 | -2.8 | -2.7 | -2.7 |
| Federal Budget Surp as % of GDP | -11.4 | -8.2 | -5.4 | -4.3 | -2.7 | -2.5 | -2.2 | -2.0 | -2.3 | -2.6 | -3.0 |
| Publicly-held debt as % of GDP | 52.5 | 61.8 | 66.5 | 68.1 | 68.6 | 68.5 | 68.5 | 68.4 | 68.5 | 68.8 | 69.6 |
| Difference | | | | | | | | | | | |
| Real GDP Growth | 0.0 | -1.1 | -2.1 | 0.1 | 0.4 | 0.6 | 0.5 | 0.2 | 0.3 | 0.2 | 0.0 |
| Unemployment Rate | 0.0 | 0.3 | 1.3 | 1.5 | 1.3 | 1.0 | 0.8 | 0.6 | 0.5 | 0.5 | 0.5 |
| CPI Inflation (yr-yr) | 0.0 | 0.0 | -0.2 | -0.5 | -0.7 | -1.0 | -1.2 | -1.4 | -1.5 | -1.6 | -1.6 |
| Current Account as % of GDP | 0.0 | 0.1 | 0.7 | 0.6 | 0.6 | 0.6 | 0.5 | 0.4 | 0.2 | -0.1 | -0.4 |
| Federal Surplus as % of GDP | 0.0 | 0.6 | 0.9 | 0.8 | 1.3 | 1.6 | 2.1 | 2.3 | 2.1 | 2.0 | 1.8 |
| Publ held debt as % of GDP | 0.0 | 0.4 | 0.9 | 0.3 | -0.5 | -1.6 | -2.9 | -4.2 | -5.4 | -6.3 | -6.7 |
| Percent Difference | | | | | | | | | | | |
| Real GDP | 0.0 | -1.1 | -3.1 | -3.0 | -2.6 | -2.0 | -1.6 | -1.4 | -1.1 | -0.9 | -0.8 |
| Consumption | 0.0 | -0.4 | -2.1 | -2.6 | -2.5 | -2.2 | -1.9 | -1.7 | -1.3 | -0.9 | -0.6 |
| Durables | 0.0 | -1.1 | -4.3 | -4.3 | -4.1 | -3.4 | -2.7 | -2.4 | -1.5 | -0.7 | -0.2 |
| Nondurables | 0.0 | -0.2 | -1.5 | -2.0 | -2.0 | -1.8 | -1.6 | -1.4 | -1.0 | -0.7 | -0.4 |
| Services | 0.0 | -0.3 | -1.9 | -2.5 | -2.4 | -2.2 | -1.9 | -1.7 | -1.3 | -0.9 | -0.7 |
| Nonresid. Fixed Investment | 0.0 | -0.8 | -4.7 | -4.1 | -2.0 | -0.7 | 0.3 | 0.6 | 0.8 | 1.0 | 1.0 |
| Equip and Software | 0.0 | -1.1 | -5.2 | -4.3 | -1.9 | -0.8 | 0.1 | 0.4 | 0.7 | 0.9 | 0.9 |
| Structures | 0.0 | 0.0 | -3.3 | -3.7 | -2.3 | -0.4 | 0.9 | 1.1 | 1.2 | 1.3 | 1.2 |
| Residential Fixed Investment | 0.0 | -0.5 | -2.2 | -1.5 | -0.6 | 1.3 | 3.3 | 4.7 | 6.0 | 6.7 | 7.0 |
| Net Exports | 0.0 | 0.0 | -0.4 | -0.3 | 0.0 | 0.1 | -0.1 | -0.7 | -1.6 | -2.6 | -3.7 |
| Exports | 0.0 | 0.0 | -0.4 | -0.3 | 0.0 | 0.1 | -0.1 | -0.7 | -1.6 | -2.6 | -3.7 |
| Imports | 0.0 | -1.1 | -5.0 | -5.0 | -4.3 | -3.7 | -3.1 | -3.0 | -2.5 | -2.1 | -1.9 |
| Federal Government | 0.0 | -8.9 | -18.5 | -19.1 | -18.2 | -16.5 | -14.8 | -13.3 | -11.9 | -10.6 | -9.5 |
| State and Local Government | 0.0 | 0.0 | -0.5 | -0.9 | -0.7 | -0.3 | 0.1 | 0.4 | 0.5 | 0.5 | 0.5 |
| Employment | 0.0 | -0.4 | -1.8 | -2.3 | -2.1 | -1.6 | -1.2 | -0.9 | -0.7 | -0.6 | -0.6 |
| Consumer Prices | 0.0 | 0.0 | -0.2 | -0.7 | -1.3 | -2.3 | -3.5 | -4.8 | -6.2 | -7.6 | -9.1 |
| Major Currency Exch Rate | 0.0 | 0.0 | -0.1 | 0.3 | 1.0 | 2.6 | 5.0 | 8.1 | 11.9 | 16.1 | 20.3 |
| Other Imp Trade P Exch Rate | 0.0 | 0.0 | 0.4 | 0.7 | 1.1 | 2.2 | 4.1 | 6.6 | 9.5 | 12.9 | 16.6 |

Table A1. Consumer recovery

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---------------------------------|-------|------|------|------|------|------|------|------|------|------|------|
| Solution | | | | | | | | | | | |
| Real GDP Growth | -2.3 | 3.0 | 2.8 | 3.5 | 3.1 | 2.6 | 2.6 | 2.5 | 2.4 | 2.7 | 2.9 |
| Unemployment Rate | 9.1 | 9.4 | 8.8 | 8.1 | 7.5 | 7.1 | 6.9 | 6.6 | 6.4 | 6.1 | 5.7 |
| CPI Inflation Rate (yr-yr) | -0.5 | 1.4 | 2.4 | 2.2 | 2.2 | 2.3 | 2.3 | 2.4 | 2.5 | 2.5 | 2.5 |
| Current Account as % of GDP | -3.2 | -4.4 | -4.6 | -4.6 | -4.4 | -4.2 | -3.9 | -3.7 | -3.2 | -2.8 | -2.5 |
| Federal Budget Surp as % of GDP | -11.3 | -8.0 | -5.5 | -4.4 | -3.2 | -3.6 | -3.9 | -3.9 | -4.1 | -4.3 | -4.5 |
| Publicly-held debt as % of GDP | 52.3 | 60.2 | 63.8 | 65.2 | 65.5 | 65.7 | 66.4 | 67.2 | 68.0 | 68.8 | 69.6 |
| Difference | | | | | | | | | | | |
| Real GDP Growth | 0.2 | 0.9 | -0.1 | -0.1 | 0.2 | 0.0 | 0.1 | 0.0 | -0.1 | 0.0 | 0.0 |
| Unemployment Rate | -0.1 | -0.5 | -0.5 | -0.4 | -0.5 | -0.5 | -0.5 | -0.4 | -0.4 | -0.3 | -0.3 |
| CPI Inflation (yr-yr) | 0.0 | 0.1 | 0.1 | 0.1 | 0.2 | 0.4 | 0.4 | 0.5 | 0.5 | 0.6 | 0.7 |
| Current Account as % of GDP | -0.1 | -0.6 | -0.4 | -0.2 | -0.2 | -0.3 | -0.3 | -0.3 | -0.2 | -0.2 | -0.1 |
| Federal Surplus as % of GDP | 0.1 | 0.7 | 0.8 | 0.8 | 0.8 | 0.6 | 0.5 | 0.4 | 0.3 | 0.3 | 0.3 |
| Publ held debt as % of GDP | -0.2 | -1.2 | -1.9 | -2.6 | -3.6 | -4.3 | -4.9 | -5.4 | -5.9 | -6.3 | -6.7 |
| Percent Difference | | | | | | | | | | | |
| Real GDP | 0.3 | 1.2 | 1.0 | 1.0 | 1.2 | 1.2 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 |
| Consumption | 0.5 | 1.6 | 1.3 | 1.1 | 1.2 | 1.4 | 1.6 | 1.6 | 1.6 | 1.5 | 1.5 |
| Durables | 3.9 | 10.4 | 5.8 | 3.4 | 3.8 | 3.8 | 4.0 | 4.2 | 4.1 | 3.9 | 3.8 |
| Nondurables | 0.0 | 0.6 | 0.9 | 0.9 | 1.0 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 |
| Services | 0.1 | 0.6 | 0.7 | 0.7 | 0.8 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 |
| Nonresid. Fixed Investment | 0.2 | 2.1 | 2.1 | 1.5 | 2.1 | 2.3 | 2.3 | 2.1 | 1.8 | 1.7 | 1.6 |
| Equip and Software | 0.3 | 2.5 | 2.1 | 1.3 | 1.9 | 2.2 | 2.2 | 2.1 | 1.9 | 1.8 | 1.8 |
| Structures | 0.0 | 1.1 | 2.2 | 2.0 | 2.5 | 2.7 | 2.6 | 2.2 | 1.7 | 1.5 | 1.4 |
| Residential Fixed Investment | 0.6 | 5.3 | 8.9 | 9.4 | 8.9 | 7.7 | 6.7 | 5.9 | 5.3 | 4.9 | 4.5 |
| Net Exports | | | | | | | | | | | |
| Exports | 0.0 | 0.3 | 0.4 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.1 | 1.4 |
| Imports | 0.7 | 5.1 | 4.1 | 2.5 | 3.0 | 3.2 | 3.4 | 3.4 | 3.4 | 3.3 | 3.3 |
| Federal Government | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| State and Local Government | 0.0 | 0.5 | 1.0 | 0.9 | 0.8 | 0.9 | 0.9 | 0.9 | 0.8 | 0.8 | 0.8 |
| Employment | 0.1 | 0.7 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.8 | 0.7 | 0.6 | 0.6 |
| Consumer Prices | 0.0 | 0.1 | 0.2 | 0.4 | 0.6 | 1.0 | 1.4 | 1.8 | 2.4 | 3.0 | 3.7 |
| Major Currency Exch Rate | 0.0 | -0.2 | -0.8 | -1.3 | -1.6 | -2.2 | -3.0 | -3.9 | -4.9 | -6.1 | -7.3 |
| Other Imp Trade P Exch Rate | 0.0 | -0.2 | -0.5 | -0.6 | -0.8 | -1.2 | -1.6 | -2.2 | -2.9 | -3.7 | -4.6 |

