

Catastrophic Budget Failure*

Leonard E. Burman
Syracuse University, Maxwell School

Jeffrey Rohaly
Urban Institute, Tax Policy Center

Joseph Rosenberg
Urban Institute, Tax Policy Center

Katherine C. Lim
Urban Institute, Tax Policy Center

March 13, 2010

* We thank Bill Gale, Andreas Lehnert, Edward McCaffery, and seminar participants at Syracuse University the Urban Institute, and the University of Southern California for helpful comments and discussions. We gratefully acknowledge financial support from the Macarthur Foundation. This is a very rough preliminary draft. Comments welcome.

ABSTRACT

Continuation of current U.S. fiscal policy will lead to an enormous accumulation of debt with potentially disastrous economic consequences. Exacerbated by the recent economic turmoil and fueled by the willingness of creditors to lend at very low interest rates, there is significant risk that necessary fiscal reform will be put off. In this paper, we consider the causes, mechanisms, and macroeconomic fallout of a *catastrophic budget failure* – a situation in which markets' perception of the credit worthiness of the U.S. government rapidly deteriorates, leaving it unable to access credit markets at any reasonable rate of interest and generating a high probability of the previously unthinkable: the U.S. government defaulting on its debt obligations, either explicitly, or implicitly by printing money. The latter outcome brings with it high inflation or even hyperinflation.

Every year, the Congressional Budget Office performs a very scary exercise: It calculates the effects on the national debt, annual deficits, and interest payments of continuing current policy. One scenario represents current law, in which most of the tax cuts enacted during the Bush Administration expire as scheduled at the end of 2010 and there is no relief from the dreaded alternative minimum tax. This relatively optimistic scenario—called the “extended baseline scenario”—also assumes that health care costs grow slower than they have for the past 50 years. The second scenario—called the “alternative scenario”—assumes the Bush tax cuts are extended, Congress continues to protect the middle class from the AMT, and that health care costs continue their march skyward.

Under both scenarios, debt explodes, although much more slowly in the extended baseline scenario than the alternative. Some analysts have quibbled with some of CBO’s assumptions and its forecasts decades ahead are surely wrong.¹ CBO itself acknowledges that its forecasts even a few years in the future—like those of other prognosticators—are highly uncertain. But few would dispute that, even under optimistic assumptions, continuation of current policies could lead to an enormous accumulation of debt with potentially disastrous consequences for the US economy.

The most important of CBO’s assumptions, as it tacitly acknowledges, is that interest rates and economic growth are invariant to debt levels. That is, its projections are simply adding up exercises, not forecasts at all. In part, they do this because building the long-term tax and spending projections into their long-term macroeconomic model causes the model to explode:

¹ See, e.g., Auerbach and Gale (2009) and Peterson-Pew Commission on Budget Reform (2009).

“Starting in the 2060s, projected deficits become so large and unsustainable that CBO's textbook growth model cannot calculate their effects.” (Congressional Budget Office, 2009)

This paper presents a preliminary analysis of the macroeconomic effects of the kind of tax and spending trajectories assumed by the CBO. We call CBO's scenarios and the macroeconomic carnage that might result “catastrophic budget failure.” We are not predicting that budget catastrophe is our destiny. Many factors could avoid the dismal future. But the potential consequences of catastrophic failure are so severe that we believe it important for policymakers to understand them.

In the long term, we are in big trouble

The United States faces significant fiscal challenges in both the short- and the long-term. The primary short-term challenge is created by the enormous amount of borrowing necessary to finance the Targeted Asset Relief Program (TARP) and the several rounds of economic stimulus needed to combat the most severe economic downturn since the Great Depression. The federal government borrowed almost \$3 trillion in 2009 and 2010, running deficits of around 10 percent of GDP each year (See Figure 1). This left the federal government at the end of 2009 with a debt of over 50% of GDP for the first time since the aftermath of World War II.

Most economists believe that borrowing to fend off economic catastrophe is a good investment. The real concern is that current economic policies could make annual trillion dollar deficits the norm rather than an infrequent and unpleasant anomaly. President Obama's proposed spending programs and tax cuts would add almost \$10 trillion to the national debt by 2020 based on CBO

projections. (Congressional Budget Office, 2010) By 2018, the annual deficits will exceed \$1 trillion. And a closer examination of the data suggests that, if anything, those projections are overly optimistic. (Auerbach and Gale, 2009) Finally, despite all the caterwauling by the newly fiscally responsible political opposition, the debt ballooned under the leadership of President George W. Bush and the Republicans' standard bearer in the 2008 presidential election would have run much bigger deficits than President Obama. (Burman, et al, 2008) Fiscal negligence is a bipartisan problem.

The bad news about the short-term projections is that they are the good news. Every year, the Congressional Budget Office (2009) projects current policies forward 75 years and calculates the possible effects on spending, tax revenues, deficits, and the debt. (The Government Accountability Office performs similar calculations.²) The projections show an alarming increase in debt. CBO considers two scenarios. The first, called the extended baseline scenario, assumes that the tax law plays out as written and that spending slows considerably. The first assumption would seem uncontroversial, but it actually would represent a major change in policy for both parties. Most of the tax cuts enacted by President Bush are scheduled to expire at the end of 2010, but the Republicans in Congress favor making them all permanent and President Obama has promised to extend all but the tax cuts affecting those earning over \$250,000. President Obama has proposed or enacted a number of other tax cuts that would spend the money "saved" by not extending the high-end tax cuts and, indeed, his budget proposed that the baseline include extending President Bush's income tax cuts. (Office of Management and Budget, 2009)

² See, for example, GAO 2009.

The other fiscally optimistic aspect of the CBO's extended baseline is that it assumes that the periodic "patches" to the individual alternative minimum tax (AMT), which have been extended continually for the past decade, are no longer enacted. The AMT is a very complicated shadow tax system originally intended to levy some tax liability on aggressive high-income tax shelterers, but through its poor design and lack of inflation adjustments, the AMT threatens to swallow the middle class in a web of complexity and higher taxes. If Congress does not extend the patch, more than 27 million taxpayers—mostly families with relatively modest incomes—will owe AMT in 2010.³ They will also be very angry, which is why Congress has preferred patching the tax law to fending off millions of irate constituents.

Like the Bush income tax cuts, the Obama budget assumes a permanent patch to the AMT as part of its baseline. For its "alternative baseline," CBO assumed permanent extension of the Bush tax cuts, a permanently patched AMT, and health care cost growth at historical levels. Under that arguably more realistic baseline, the debt explodes. By 2023, it reaches 100 percent of GDP and, by 2038, 200 percent. (Figure 2) But, even under the wildly optimistic extended baseline, the debt climbs to unsustainable levels—albeit more slowly.

In fact, there are other very optimistic features of CBO's projections. Most notably, CBO assumes that interest rates on government securities remain very low. The average real interest rate actually falls from 2013 to 2024 from 4 percent to 3 percent and remains there throughout the projection period, even though the primary deficit increases steadily from 2013 on in the alternative scenario and after 2018 in the comparatively optimistic extended baseline. Gale and Orszag (2004) report that the interest rate increases by between 40 and 70 basis points for every

³ See Tax Policy Center Table T09-0384, <http://www.taxpolicycenter.org/numbers/displayatab.cfm?DocID=2459>

1 percentage point increase in the primary deficit as a percentage of GDP. By that metric, one would expect interest rates to increase by at least 4 percentage points between 2013 and 2083 under the alternative scenario, increasing interest costs and swelling the debt.⁴

The other component of CBO's rosy scenario is an assumption of continued economic growth. CBO assumes real GDP recovers after the recession and then grows at roughly trend rates throughout the projection period. In fact, if interest rates respond as Gale and Orszag predict, economic growth would stagnate because businesses would have difficulty financing investments and households would have trouble borrowing money to buy homes, cars, or other consumer durables. Reinhart and Rogoff (2010) estimated that debt-to-GDP ratios over 90 percent reduce annual GDP growth by an average of 1.3 percentage points.⁵ Building such a response into the CBO projections produces an even more dismal path for the debt. (Figure 3)

In our view, this is far from the most dreadful scenario. If interest rates did respond to growing debt, there would be pressure on policymakers to take steps to reduce the deficit. That is what happened in the early 1980s. Ronald Reagan campaigned promising tax cuts and he delivered—pushing through the largest tax cut in history in 1981. What is sometimes forgotten, though, is that he was later convinced that the tax cutting had gone too far when Wall Street complained that the deficits were pushing up interest rates, stifling investment. President Reagan responded by supporting a large tax increase. He eloquently made the case for a tax increase:

⁴ Note that this is forecasting far outside of sample. The US has never accumulated debts in the range projected by the CBO. As discussed below, the interest rate response is likely to be much, much larger if debt accumulates as projected.

⁵⁵ The authors did not find a significant effect on GDP at lower debt levels.

The single most important question facing us tonight is: Do we reduce deficits and interest rates by raising revenue from those who are not now paying their fair share - or do we accept bigger budget deficits, higher interest rates and higher unemployment... We're within sight of a safe port of economic recovery. Do we make port or go aground on the shoals of selfishness, partisanship and just plain bullheadedness?⁶

While higher interest rates would be damaging to the economy in the short run, especially if they came before the economy had recovered from the financial market meltdown, they would have the salutary effect of restraining deficits because policymakers would see a cost to political pandering.

A far worse situation would be for interest rates to stay low while we accumulate unprecedented amounts of debt only to respond very suddenly when financial markets or foreign lenders decide that the United States is no longer a good credit risk. That could produce a catastrophic financial meltdown, similar to the one triggered by the bursting of the housing market bubble, but with one important difference. If the crisis is caused by a surfeit of government debt, the government will not be able to borrow to deal with its effects. This would be a catastrophic budget failure.

A Model of Catastrophic Budget Failure

The key players in the model of catastrophic budget failure are the public, policymakers, and lenders. The public cares about public services, taxes, and deficits. Policymakers want to get re-elected so they try to satisfy the public's demand for more public service and lower taxes, limited

⁶ Ronald Reagan, "Televised Speech On Tax Policy" (as reported by the New York Times), August 17, 1982,

only by the public's expressed concern about deficits. Lenders supply funds to the federal government (and other borrowers). Domestic lenders maximize profits whereas foreign lenders' objective function is more complex.

Policymakers' dilemma

The basic problem is that policymakers want to make people happy, which means more spending and lower taxes. As long as interest rates stay low and the public does not express a strong aversion to deficits, there is little cost to political pandering. Politicians face the same kind of incentive for short-term actions that may be detrimental over the long-term as corporate executives do. Corporate CEOs are rewarded financially for boosting short-term profits, even if they harm the company over the long-term. Political leaders perceive that their reelection depends on short-term results, even if the short-term expedients may be disastrous over the long term.

Indeed, policymakers may sincerely want to tackle the deficit, but their political advisors will always tell them that now is not the time to take unpopular steps for the public good. "Mr. President, if you raise taxes or cut popular programs, you and your party will be defeated in the polls and the bad guys will take over. The bad guys do not share your priorities and they do not care about the deficit. Therefore, you cannot effectively deal with the deficit; all you can do is undermine your agenda."⁷ Conclusion: it is impossible to deal with the deficit, so don't even try.

⁷ See Alesina and Drazen (1991) for a formal treatment of delayed stabilization resulting from differing preferences among policymakers.

A possible solution to this bind would be a bipartisan agreement to deal with the deficit, which could inoculate both parties from the political damage arising from proposing unpopular fiscal measures. There have been efforts, such as the collaboration of Senator Kent Conrad (D-ND), chairman of the Senate Budget Committee, and Judd Gregg (R-NH), ranking member, on a bipartisan budget commission. The problem with this scenario is the increasing polarization of the two parties. Both parties seem to have learned that the winning strategy is to play Santa Claus—simply give away goodies at every opportunity—which precludes scroogish fiscal discipline.⁸ The fact that partisanship seems to be at a historic high further reduces the odds of successful collaboration.

Lenders' myopia and ulterior motives

Policymakers' myopia might be less problematic if financial markets were sending signals to policymakers that the borrowing was unsustainable. Higher interest rates would raise the actual and perceived cost of deficit financing, which would alter the political calculus in favor of fiscal restraint. However, at the same time that the debt was burgeoning in the last decade, interest rates were plummeting. (Figure 4)

It is possible that interest rates would have been lower over the same time period absent government borrowing or that the Fed was keeping rates artificially low, as some have claimed. But the fact is that financial markets have not been clearly signaling that US debt is excessive for some time.

⁸ Jude Wanniski (1976) actually advised Republicans to jettison their doctrine of fiscal discipline, arguing that it hurt the party in the polls and prevented them from enacting beneficial supply-side tax cuts.

Going forward, there is a legitimate concern that markets might not appropriately price the risk inherent in continued Treasury borrowing. Keep in mind that the same geniuses who thought they could make money selling mortgages to people with no reliable source of income and no downpayment also trade government bonds. “Liar loans” were profitable as long as house prices kept growing at double-digit rates, prodded on by extremely low interest rates. That worked for a while.

The analogy in the government bond market is that the US government can easily pay its debt service as long as interest rates stay low and the economy continues to grow. Right now, even though debt is at a post-war record, interest on the debt only amounts to about 1.2 percent of GDP because interest rates are so low.

There are a number of models of debt crises in which multiple equilibria exist. In one equilibrium, interest rates are low and default is avoided. In the other, investors perceive a risk of default, which produces a self-fulfilling debt crisis.⁹ Romer (2006) develops a very simple model where investors require an interest rate that compensates them for the risk of default. When the risk of default is low, interest rates are low. In this model, a random shock to interest rates increases the government’s debt service cost, which increases the risk of default, requiring a higher interest rate still. Under certain circumstances, this can produce a dynamic where lenders are not willing to lend at any interest rate and default is assured. That is, there is a tipping point beyond which interest rates explode and default is certain.

⁹ See, e.g., Cole and Kehoe (2000), Calvo (1988), and Alesina, Prati, and Tabellini (1989).

Other models can produce similar bubble phenomena. In herd models, investors have imperfect information and attempt to infer information from observing other market actors. If the first movers in the market act erroneously (for example, by underestimating the default risk of financial assets), other participants follow their lead. This leads to a bubble. When additional information proves the early movers wrong, the herd exits the market.¹⁰

A further complication is that some investors in US bonds have multiple reasons for holding US debt, only one of which is a desire to earn a suitable rate of return. Foreign lenders held about half of US government debt in July 2009 (Figure 5). The money they sent us fueled demand for their exports, propping up their own economies. If they had cut off the flow of capital, the dollar would have weakened, which would have reduced demand for their products, possibly pushing their own economies into a recession. Over the long run, there is a one-to-one relationship between capital inflows into a country and its net imports. Thus, lending from overseas may be an explicit or implicit policy to boost demand for exports. This might continue even if the foreign lenders perceived an increased risk of default from the US. And the perception that the Chinese or oil countries are willing to meet all of the US's capital needs may provide an implicit guarantee that reassures other lenders, even if they harbor doubts about the long-term fiscal prospects of the US.

The problem with this scenario is that foreign lenders' ability and willingness to lend to the US is not limitless. If the US's debt really did grow to 2 or 3 times GDP, our borrowing would strain the resources of even OPEC and China. China, despite dramatic economic growth, is still a very

¹⁰ See Banerjee (1992) for the seminal model and Chari and Kehoe (2003) for a more robust version.

poor country. If it follows the pattern of other developing nations, it will start spending more of its income domestically (and stop sending so much to bolster the consumption of the richest nation on earth). Foreign lenders would have to be concerned that an abrupt stop to the flow of capital to the United States could trigger a worldwide recession, but at some point, they might well decide that a debt crisis in the US is unavoidable and rationally conclude that it would be better to do it sooner rather than later.

Perhaps the most distressing possibility is that a foreign lender might decide that it is in its strategic interest to provoke an economic crisis in the US. As the US debt and our dependence on foreign lenders grow, the possibility of a strategic withdrawal of capital grows too.

Anatomy of a Debt Crisis

In their excellent survey of debt crises through the ages, Reinhart and Rogoff (2009) show that there is no magic threshold beyond which a debt crisis is imminent. It depends on the nation, the time, and doubtless many intangible factors. The models of debt crises invariably include a “sunspot” or random component. Nearly one-fifth of countries that defaulted or required debt restructuring had debt of less than 40 percent of GNP, and more than half of countries experiencing debt crises had debt levels below 60 percent of GNP. Thus, 60 percent might be viewed as a rough barometer of high risk for budget failure.¹¹ However, nearly one sixth of countries did not reach a crisis point until their debt level had exceeded 100 percent of GNP.

¹¹ Interestingly, the European Union requires its members to have debt below 60 percent of GDP, although enforcement is problematic. (See, e.g., Greece.) The Pew-Peterson panel recommended that the US get its debt level down to 60 percent of GDP by 2018 before taking steps to reduce it further over the long term. The Reinhart-Rogoff data provide a basis for the seemingly arbitrary threshold.

Table 1. Distribution of Defaults or Restructurings by Debt Level, Middle-Income Countries, 1970-2008	
External Debt/GNP at end of first year of default or restructuring	% of total defaults or restructurings
< 40	19.4
41-60	32.3
61-80	16.1
81-100	16.1
> 100	16.1
Source: Reinhart and Rogoff (2009), p. 24.	

Similarly, there is a great deal of heterogeneity in debt levels among developed nations. (Figure 6.) While, in 2008, the United States had a debt equal to about 40 percent of GDP, nine nations had debt/GDP ratios of 60 percent or more. Japan's debt exceeded 160 percent of GDP, although that country also holds enormous reserves of foreign currency. But Belgium, Greece, and Italy had debt levels over 80 percent of GDP without experiencing a debt crisis. Given that the US has much lower taxes and spending levels than those European countries, this suggests that, unless something dramatically changes in world financial markets, we may be able to accumulate considerably more debt before a crisis occurs.

That may seem reassuring, but it is in fact very bad news. To see why, suppose lenders deemed us a poor credit risk now. In October 2009, over \$2.5 trillion of debt had a maturity of one year or less. (Figure 7) If that debt could not be rolled over, the government would have to raise taxes and cut spending enough to eliminate the primary deficit, cover interest on the rest of the outstanding debt, and pay off the \$2.7 trillion in bonds coming due within a year. The weak state of the economy would clearly make such draconian fiscal tightening impossible, but even if the economy were healthy, this would create enormous challenges. The debt coming due in year one is more than twice individual income tax receipts in a good year. Raising income taxes would

not be sufficient to close the gap. Unprecedented spending cuts along with a new source of tax revenue, such a value-added tax, would be necessary. Since these measures would take time to implement (several years in the case of a VAT), the Federal Reserve would have to abandon its inflation targets and create money to purchase the bonds, at least on an interim basis. The economic dislocation created by extremely contractionary fiscal policy and extremely inflationary monetary policy would be disastrous, as discussed below.

But, as bad as it would be, the debt/GDP ratio in 2009 was *only* about 50 percent. If the crisis did not come until debt reached 150 percent of GDP, the economic dislocations would be tripled. The longer it takes for the crisis to occur, the worse it will be.

What happens when the bubble bursts?

Catastrophic budget failure amounts to the bursting of a bubble in the market for US government securities. Interest rates increase dramatically when investors decide that US bonds are no longer a safe asset. In the extreme case, the US may not be able to borrow at any interest rate.

Note that the United States has no reliable way of avoiding a debt crisis as long as it accumulates more debt. The US may be completely committed to repaying its creditors, but there is no way for creditors to know that with certainty. According to Reinhart and Rogoff (2009), sovereign defaults, unlike personal and corporate bankruptcies, often occur before nations are destitute. It is simply a cost-benefit calculus: the cost of default, which include at least temporary lack of

access to foreign capital, possible international sanctions, and a confiscation of wealth from bondholders are deemed to be lower than the cost of paying off the debt.

If investors decide that a default is likely, it can become a self-fulfilling expectation, even if the US had no intention of ever renegeing on its responsibilities. And without the ability to roll over mature debt, the nation could at least temporarily become insolvent.

Macroeconomic effects of a debt crisis

Depending on the nature and timing of the crisis moment, the U.S. government will have a different set of policy response options. The common factor in these options is that they all have severe, negative macroeconomic consequences.

As discussed above, one possibility is that US Treasury rates rapidly rise as investors update their beliefs about the future solvency of the U.S. government or their beliefs about what other investors believe about the future solvency of the U.S. government, causing U.S. government bond prices to drop and yields to soar. The U.S. dollar would fall precipitously on foreign exchange markets as investors rush out of U.S. bonds and into the bonds of whichever country or region is deemed a safe haven at that moment, or if the crisis is even more severe into commodities such as gold or silver.

In this “rosy” scenario, the U.S. government might still be able to borrow on international capital markets but it would pay an extremely large risk premium to do so. There would be no *de facto*

or *de jure* default but the suddenness and magnitude of the increased borrowing costs for the government would have major macroeconomic repercussions. And in fact, if the government did not respond with a credible plan for increased revenues and reduced outlays, the increased borrowing cost itself could lead investors to raise their estimate of the likelihood of a future default by the government. This could cause an upward spiral of interest rates and eventually a sudden stop in all international lending to the U.S.

The more dramatic scenario involves the sudden freezing of the US Treasury market altogether and an inability of the U.S. government to roll over debt that is coming due in order to make interest payments on other existing government debt or to fund government activities. In this case, no one is willing to lend to the U.S. government at any interest rate. Essentially, the Treasury holds a debt auction and no one shows up.¹²

Under this scenario, the government would need to buy itself some time in order to devise policies to get creditors to lend again. One option would be to default on the debt by temporarily suspending interest and principal payments on outstanding bonds.¹³ Another possibility is a negotiated debt restructuring, by either converting short-term debt to longer-term debt or imposing “haircuts” by issuing new bonds to replace the existing ones that have a face value less than 100 percent of the original issue. As part of any rescheduling and restructuring plan, creditor countries and domestic lenders would certainly demand certain fiscal policy actions be taken in the United States; taxes would need to rise dramatically and spending would need to be

¹² Alternatively, the US might cancel the auction when it learns through futures prices and possibly even public announcements from creditor countries that it would likely have no buyers for its next debt issue.

¹³ Along with the suspension of debt payments, the salaries of federal government workers would either go unpaid, or would be paid with IOUs that could be redeemed at a future date.

cut. Creditors would walk a fine line, however, as a dramatic fiscal contraction could hurt both U.S. and world growth to such an extent that even the restructured debt could not be paid back and the ground instead would be laid for future defaults.¹⁴

Another option would be a *de facto* default through printing money. In practice, this would likely involve the Federal Reserve buying up the new Treasury debt that other investors were unwilling to purchase. In exchange, the Treasury would receive funds from the Fed with which to pay interest on other existing debt or to fund government activities. In the absence of sufficient tax revenue or funding from abroad, the federal government would rely on seignorage revenue to fund its activities.

Regardless of the specifics of how the debt crisis evolves, the solution would necessarily involve massive fiscal adjustment.¹⁵ What would the likely macroeconomic consequences of a dramatic and severe debt crisis be?

Qualitatively, a standard short-run Keynesian-type macroeconomic model would predict that a dramatic increase in the risk-premium would mean that the U.S. government, and domestic firms and households, would no longer be able to borrow at the “world” interest rate that was previously available to them.¹⁶ The increased borrowing cost for domestic firms would reduce the expected profitability from investment and therefore reduce aggregate investment spending.

¹⁴ Reinhart and Rogoff (2009) show that serial default has been common historically.

¹⁵ The magnitude of the adjustment would be strongly influenced by the timing of the crisis moment. In fact, if corrective policies were adopted early enough that either the size of outstanding debt was “modest” or most of the adjustment could take the form of credible commitments to reduce future government deficits, the macroeconomic effects could be manageable. See Alesina and Perotti (1995) for evidence of expansionary fiscal contractions.

¹⁶ Jones (2009) provides a standard textbook treatment of the introduction of a risk premium into a short-run Keynesian model. His discussion is in the context of the current financial crisis.

Households would also face higher borrowing costs and would reduce consumption spending as well. Both of these would act as a further drag on aggregate demand at the same time that the government was forced to raise taxes and cut spending. In theory, the depreciation of the U.S. dollar should help exporters as the relative price of U.S. goods would fall on international markets. This would help to offset the drop in aggregate demand caused by domestic forces. A complicating factor is that if the economic downturn in the United States were to spread to other countries – a highly likely scenario given the large role of the U.S. in the world economy and the number of countries that would be vulnerable to a future default by the U.S. through their holdings of Treasury securities – there could be a worldwide dropoff in demand for U.S. exports despite their lower foreign currency price.

Existing estimates of the effects of increased interest rates and fiscal contractions are difficult to apply to a situation like this. In modern times, no country as economically dominant as the United States has suffered such a series of macroeconomic setbacks at the magnitudes that would likely occur under this scenario. In addition, macroeconomic models vary widely in their predictions for the effects of fiscal policy on real variables such as output and unemployment.

In its recent analysis of the macroeconomic effects of the 2009 stimulus legislation, the Congressional Budget Office (CBO) produced a range of estimates by relying on several different types of analysis: output from macroeconometric forecasting models; general equilibrium macro models; and direct extrapolation of historical data (CBO 2009).

Macroeconometric models are typically large-scale models that predict the economy's potential level of output, based on estimated stocks of capital and labor, combined with a production technology. In addition, they model the different components of aggregate demand based on historical data and theoretical assumptions about the determinants of the components of aggregate demand such as consumption and investment. These models typically allow for a role for aggregate demand in the determination of output in the short-run and therefore tend to produce the largest multipliers for fiscal policy changes.

Another class of models—general equilibrium (GE) models—are built up from optimizing behavior of rational, perfectly informed individuals and firms. Individuals in these models are typically forward-looking and base their decisions of how much to work, consume, and save on their expectations of current and future income, interest rates, government tax and spending policies, and other economic variables. GE models typically produce estimates of fiscal policy multipliers that are significantly lower than those produced by more Keynesian-type macroeconometric models.

CBO's conclusions based on these models and on historical experiences were that direct changes to government spending would have a multiplier in the range of +1.0 to +2.5. This means that a \$1 increase in government spending could be expected to increase real Gross Domestic Product (GDP) by somewhere between \$1 and \$2.5 over the next several quarters. Tax changes would have a multiplier between -0.5 and -1.7. The tax changes examined by CBO were temporary in nature, however, and aimed primarily at lower-and middle-income households. Permanent tax changes would likely have a larger impact.

According to these estimates, if the crisis forced the U.S. government to close a budget gap of, for example, 10 percent of GDP, the resulting fall in output could approach 25 percent—a decline not seen since the Great Depression

Romer and Romer (2009) use a different approach to estimate fiscal policy multipliers, specifically the tax multiplier. The Romers sift through the historical narrative record to derive the size, timing, and purported justification for each major postwar tax change in the United States. This allows them to separate out tax changes that occur in response to economic conditions and those that occur for exogenous reasons. Using the observations where tax changes occur for exogenous reasons allows the Romers to overcome the omitted variable bias inherent in simple regressions of output against measures of changes in taxes. Their approach yields a large tax multiplier, close to 3 in absolute value. Taken at face value, this means that the negative impact on output could be even larger than the CBO analysis suggests. Closing a budget gap of 10 percent of GDP could result in a 30 percent drop in real output. The Romers make several points about their results. The first is that their results do not say anything about whether the tax multiplier is larger than the government spending multiplier despite the fact that their tax multiplier estimate is much larger than other estimates. The government spending multiplier estimates could suffer from the same omitted variable bias that they describe for tax changes. Second, although their estimates are significant, they are imprecise and the confidence interval for the multiplier is quite large. Finally, the Romers find some weak evidence that tax changes that are undertaken for the purpose of reducing the budget deficit have a smaller

negative impact on output than changes taken for other reasons, such as to stimulate long-run growth.

For an historical perspective, Reinhart and Rogoff (2009) construct an extensive dataset on financial crises—external and domestic defaults, banking crises, and combinations of the two—across countries throughout the last two centuries. They find that real GDP falls an average of 1.4 percent in the year before an external default and 1.2 percent in the year of default.

Countries experiencing severe banking crises saw their real GDP drop by an average of 9.3 percent and the average time from peak to trough was 2 years. For countries that experienced severe financial crises, it took an average of 4.4 years for real GDP to reach pre-crisis levels and public debt increased by an average of 86 percent. But it is not clear how relevant these experiences would be to the US.

Over the longer term, a standard neoclassical model would predict that reduced investment caused by either lack of access to international capital markets or because of a significant risk premium, would depress capital accumulation and thus lead to a lower path of income per capita.¹⁷ If government cutbacks extend to research and development, as is likely since the government would reduce spending on all but the most essential goods and services, technological progress and thus total factor productivity growth could also fall.¹⁸ Various endogenous growth models would then predict either a further fall in the path of income per capita or a permanently lower growth rate of income per capita.¹⁹

¹⁷ For a discussion of the Solow-Swan model, see either Romer (2006) or Barro and Sala-i-Martin (2003).

¹⁸ CBO (2007) discusses current U.S. government subsidies and direct expenditures on research and development.

¹⁹ See, for example, Romer (1990) and Jones (2003).

As both economic theory and history indicate, the result of (or perceived threat of) using seignorage to fund government activities is inflation and if taken to an extreme, hyperinflation. While inflation can have the benefit to the government of reducing the real value of any outstanding debt, that benefit is limited if debt is concentrated in short maturities. In many other countries, particularly emerging economies, there is a sharp distinction between the nature of external and domestic debt, as pointed out by Reinhart and Rogoff (2009). External debt is typically denominated in foreign currency whereas domestic debt, generally held by domestic residents, is denominated in domestic currency. Thus inflation would erode the real value of domestic debt but not external debt. Accordingly, historical inflation rates surrounding external defaults are much lower than those experienced during a domestic default. Reinhart and Rogoff find that the average inflation rate during the year of an external crisis is 33 percent with inflation averaging 32 percent during the three years following the crisis. The equivalent figures for domestic defaults are 171 percent and 120 percent. From beginning to end of crisis, Reinhart and Rogoff estimate that prices increased 9000 percent, on average. Put differently, a pre-crisis dollar was worth 1.1 cents three years after the debt crisis. For the United States, debt held by both domestic and foreign entities is denominated in dollars. Thus inflation in the United States would dramatically deflate the value of both external and domestic debt resulting in an effective default on the vast majority of the debt .

While printing money “works” in the limited sense of paying off creditors with cash, the cost to the US and world economies of the resulting inflation or hyperinflation should not be underestimated. All holders of dollar denominated assets, including all US financial institutions would experience a huge decline in wealth. Effectively, the average level of inflation calculated

by Reinhart and Rogoff would amount to a 99 percent tax on all existing wealth (and a huge windfall to debtors). Financial institutions would suffer greater losses than in the 2008 financial, and the insolvent federal government would be powerless to help them. The “wealth effect” of devaluing asset holdings would dramatically cut domestic consumption, compounding the contractionary effect of the government’s tax increases and spending cuts. Because many contracts are set in nominal dollars (without an adjustment for inflation) many businesses would suffer huge losses and many would fail. And because dollars would be devaluing so quickly, households and firms would take steps to minimize the holding of cash. In the extreme, barter may become preferable, but barter is inefficient.

Printing money without some negotiation with foreign creditors, and certainly without concomitant actions to reduce the budgetary imbalance, would not be a long-run solution. It is highly unlikely that the U.S. would regain access to international capital markets if it were to simply walk away from its external debts or if it continued to technically meet its debt payment requirements using dramatically devalued dollars. A more realistic scenario would be to print money as a temporary stopgap until the U.S. could agree with its creditors on a restructuring of its debt. However, there would be enormous pressure on policymakers to continue providing essential services and at least a fraction of the Social Security and Medicare that were promised to seniors. As a result, inflation would be almost inevitable since the government could not provide those services and pay off its creditors without income from seignorage.

The final piece in this macroeconomic tragedy is that the failure of the US Treasury market would almost certainly set off a severe global financial crisis. Banks and other lending institutions that hold US Treasuries would see their balance sheets rapidly deteriorate. This would lead to widespread asset devaluation and a deleveraging and liquidity crisis much like—although likely more severe than—the one the world experienced in 2008.

The bottom line is this: Catastrophic budget failure would produce a worldwide recession or depression and likely provoke a massive financial market meltdown. Government would have to raise taxes to unprecedented levels while slashing spending to the bone, simply to pay off its creditors. Neither liberals nor conservatives would be able to take any solace in that outcome. There would be a serious risk of inflation or hyperinflation, with the attendant large economic costs. It could easily take the nation a generation or longer to recover from the disaster.

Avoiding Catastrophic Budget Failure

The good news is that the risk of catastrophic budget failure is probably still years away. The United States debt exceeded 100 percent of GDP at the end of World War II, and the nation was able to pay it down fairly quickly. To be sure, there was an enormous peace dividend to ease the way and, even so, the sudden reduction in government spending led to a significant economic recession, but the results were not disastrous. While the US lacks a comparable peace dividend now, we are much, much richer than we were in 1945. Paying down the debt in an orderly fashion is feasible.

The question is what would precipitate a change in policy. One option is presidential leadership. President Obama and his senior advisors are clearly concerned about the long-term budget situation. The president could signal an interest in working with Republicans to craft a bipartisan budget process that would control deficits. Jens Henriksson (2007), who served several ministers of finance in Sweden as that country dealt with a debt crisis, advises that liberals could signal commitment by offering to cut spending, and that conservatives could do likewise by offering to support tax increases.²⁰ For example, the president could offer to cut spending by a dollar for every dollar that taxes increase. It is not clear that this approach would be successful because it would likely be extremely unpopular with the base of each political party, but something like it has to happen.

In fact, the president has sent mixed messages about fiscal discipline. While his budget would produce almost \$10 trillion in deficits over the decade, it also supported the creation of a bipartisan deficit commission. Legislation to enact such a commission failed to pass Congress because of opposition from liberals who feared its effect on cherished programs and conservatives concerned that the panel's recommendations would include more taxes. Instead the president appointed a commission with members appointed by legislative leaders from both parties. However, since all of the Republican members appear inalterably opposed to any tax increases, the scope for compromise seems limited and many analysts believe the panel is doomed to failure.

²⁰ Henriksson also suggests that the leader promise to resign if budget targets are not met. With the president's approval rating heading south fast, that threat might not evoke the desired response.

Another possibility is that budget deficits become salient to voters. This might happen when the debt/GDP ratio crosses the threshold for admission to the EU or it might happen when debt exceeds 100 percent of GDP—the level last seen at the end of World War II. Or the insolvency of the Medicare trust fund, currently predicted to occur in [2014], might force a reexamination of spending on medical care for seniors and the revenues that fund it. If Medicare's finances were brought into balance, the long-term budget situation would brighten considerably (although excess spending growth in Medicaid and Social Security's actuarial imbalance would still swell the debt over time, albeit much more slowly).

Alternatively, the public may become aware of ways in which growing debt is constraining our behavior in undesirable ways. For example, the *New York Times* reported that the president soft-pedaled on human rights during his last visit to China because of concerns about alienating a major lender: “The result: unlike his immediate predecessors, who publicly pushed and prodded China to follow the Western model and become more open politically and economically, Mr. Obama will be spending less time exhorting Beijing and more time reassuring it.”²¹

Or citizens may begin to understand the connection between government deficits and anemic private saving and the balance of trade deficit. If voters thought that the budget deficit increased the risk of their job moving to China, they might become more concerned about it.

Finally, the press might step up reporting on the consequences of catastrophic budget failure. McCombs and Shaw (1972) report that public opinion does not move until the mass media report an issue as news. The only problems are (1) a large and growing debt ceases to become news

²¹ “China's Role as Lender Alters Obama's Visit,” *New York Times*, 2009.

unless there is a related crisis (which might come too late), and (2) it is not clear who is setting the agenda in an era of bloggers and custom-tailored news.

So we might be in trouble.

References

- Alesina, Alberto, and Allan Drazen. 1991. "Why are Stabilizations Delayed?" *American Economic Review*, 81, 1170-1188.
- Alesina, Alberto, Alessandro Prati, and Guido Tabellini. 1989. "Public Confidence and Debt Management: A Model and a Case Study of Italy." NBER Working Paper 3135.
- Auerbach, Alan J. and William G. Gale. 2009. "The Economic Crisis and the Fiscal Crisis: 2009 and Beyond." *Tax Notes*. (October)
- Banerjee, Abhijit. 1992. "A Simple Model of Herd Behavior," *Quarterly Journal of Economics*: 107 (3), pp. 797-817.
- Barro, Robert J., and Xavier Sala-i-Martin. 2003. *Economic Growth*, 2nd edition. The MIT Press.
- Burman, Leonard E., Surachai Khitatrakun, Greg Leiserson, Jeff Rohaly, Eric Toder, Robertson Williams. 2008. "An Updated Analysis of the 2008 Presidential Candidates' Tax Plans," Tax Policy Center. (July 23)
http://www.taxpolicycenter.org/UploadedPDF/411741_updated_candidates.pdf.
- Calvo, Guillermo. 1988. "Servicing the Public Debt: The Role of Expectations," *American Economic Review*: 78 (4), pp. 647-61.
- Chari, V.V., and Patrick J. Kehoe. 2003. "Hot Money." Staff Report 228. Federal Reserve Bank of Minneapolis.
- Cole, Harold L., and Timothy J. Kehoe. 2000. "Self-fulfilling Debt Crises." *The Review of Economic Studies*: 67 (1).
- Congressional Budget Office. 2007. "Federal Support for Research and Development." (June)
- Congressional Budget Office. 2009. "Estimated Impact of the American Recovery and Reinvestment Act on Employment and Economic Output as of September 2009." (October)
- Congressional Budget Office. 2009. "The Long-Term Budget Outlook." (June)
- Government Accountability Office. 2009. "The Federal Government's Long-Term Fiscal Outlook, Fall 2009 Update." GAO-10-137SP. (October)
- Henriksson, Jens. "Ten lessons about budget consolidation." Bruegel Essay and Lecture Series, 2007.
- Jones, Charles .I. (2003). "Population and ideas: A theory of endogenous growth". In: Aghion, P., Frydman, R., Stiglitz, J., Woodford, M. (Eds.), *Knowledge Information and Expectations in*

Modern Macroeconomics: In Honor of Edmund S. Phelps. Princeton University Press, Princeton, NJ, pp. 498–521.

Jones, Charles I. 2009. *Macroeconomics: Economic Crisis Update*. New York: WW Norton.

McCombs, Maxwell, and Donald Shaw, “The agenda-setting function of mass media,” *Public Opinion Quarterly*, 36, 1972, 176-187.

Office of Management and Budget. 2009. “Budget of the United States Government for Fiscal Year 2010.”

Pew-Peterson Commission on Budget Reform. 2009. “Red Ink Rising A Call to Action to Stem the Mounting Federal Debt.” (December)

Reinhart, Carmen M., and Kenneth S. Rogoff. 2009. *This Time is Different: Eight Centuries of Financial Folly*. Princeton University Press.

Reinhart, Carmen M., and Kenneth S. Rogoff. 2010. “Growth in a Time of Debt,” *The American Economic Review Papers and Proceedings*. (forthcoming)

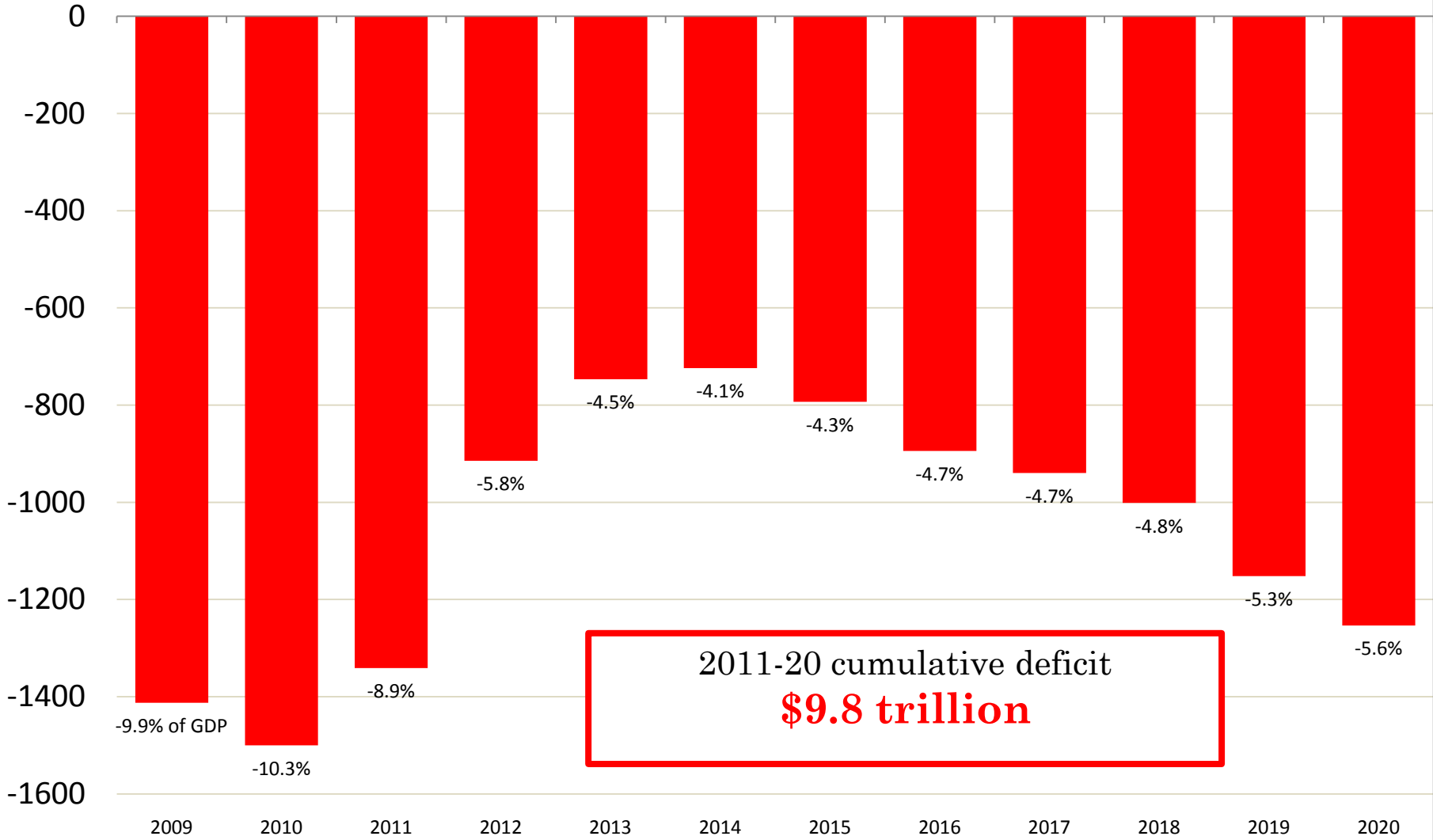
Romer, David. 2006. *Advanced Macroeconomics*, 3rd edition. New York: McGraw-Hill.

Romer, Christina D., and David H. Romer. 2009. “The Macroeconomic Effects of Tax Changes: Estimates Based on a New Measure of Fiscal Shocks.” *American Economic Review* (forthcoming)

Romer, Paul M. (1990). “Endogenous technological change”. *Journal of Political Economy* 98 (5): S71–S102.

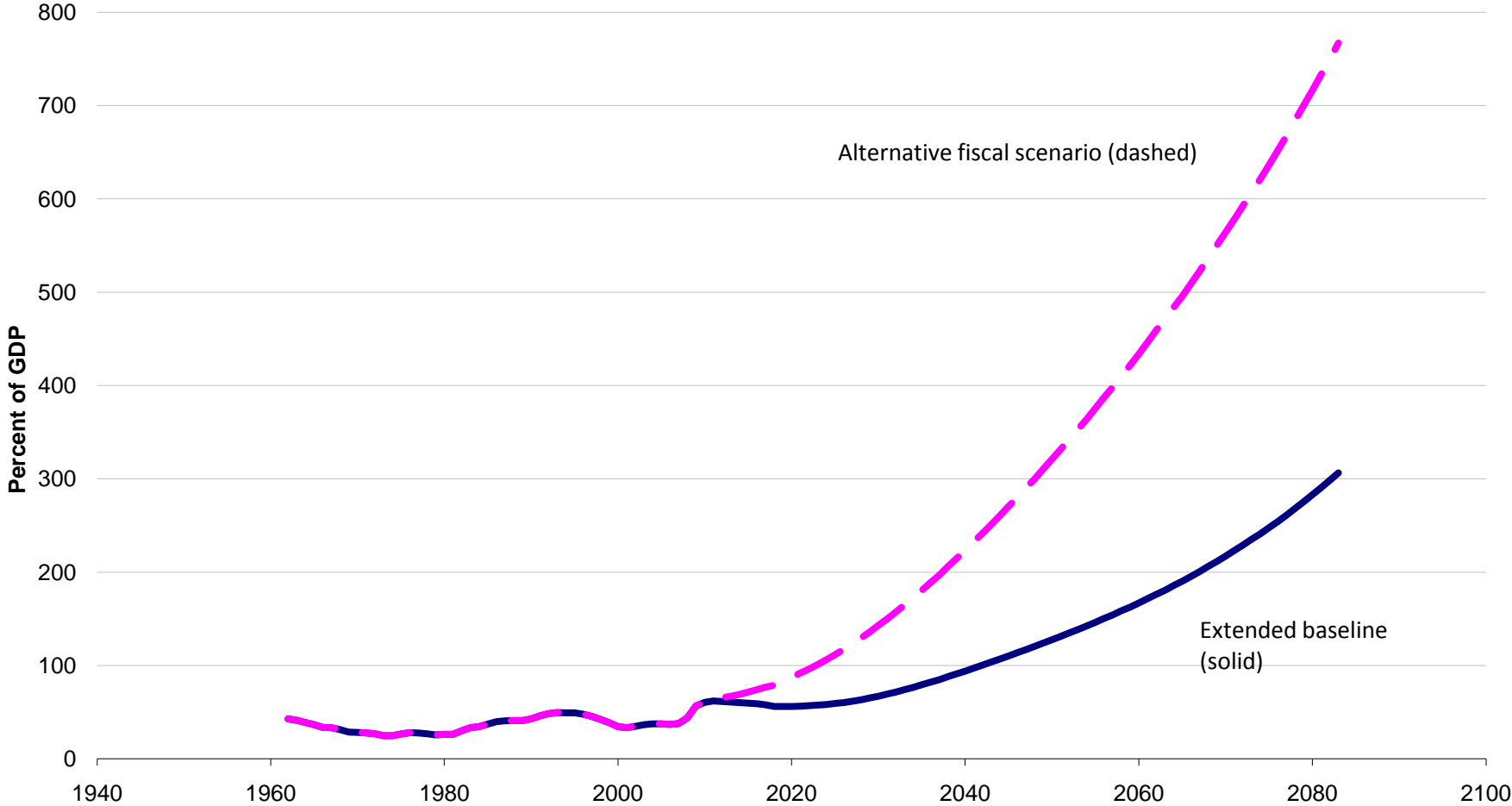
Wanniski, Jude (1976). "Taxes and a Two-Santa Theory," *National Observer* (March 6)

FIGURE 1. CBO DEFICIT PROJECTIONS FOR OBAMA BUDGET, IN \$BILLIONS



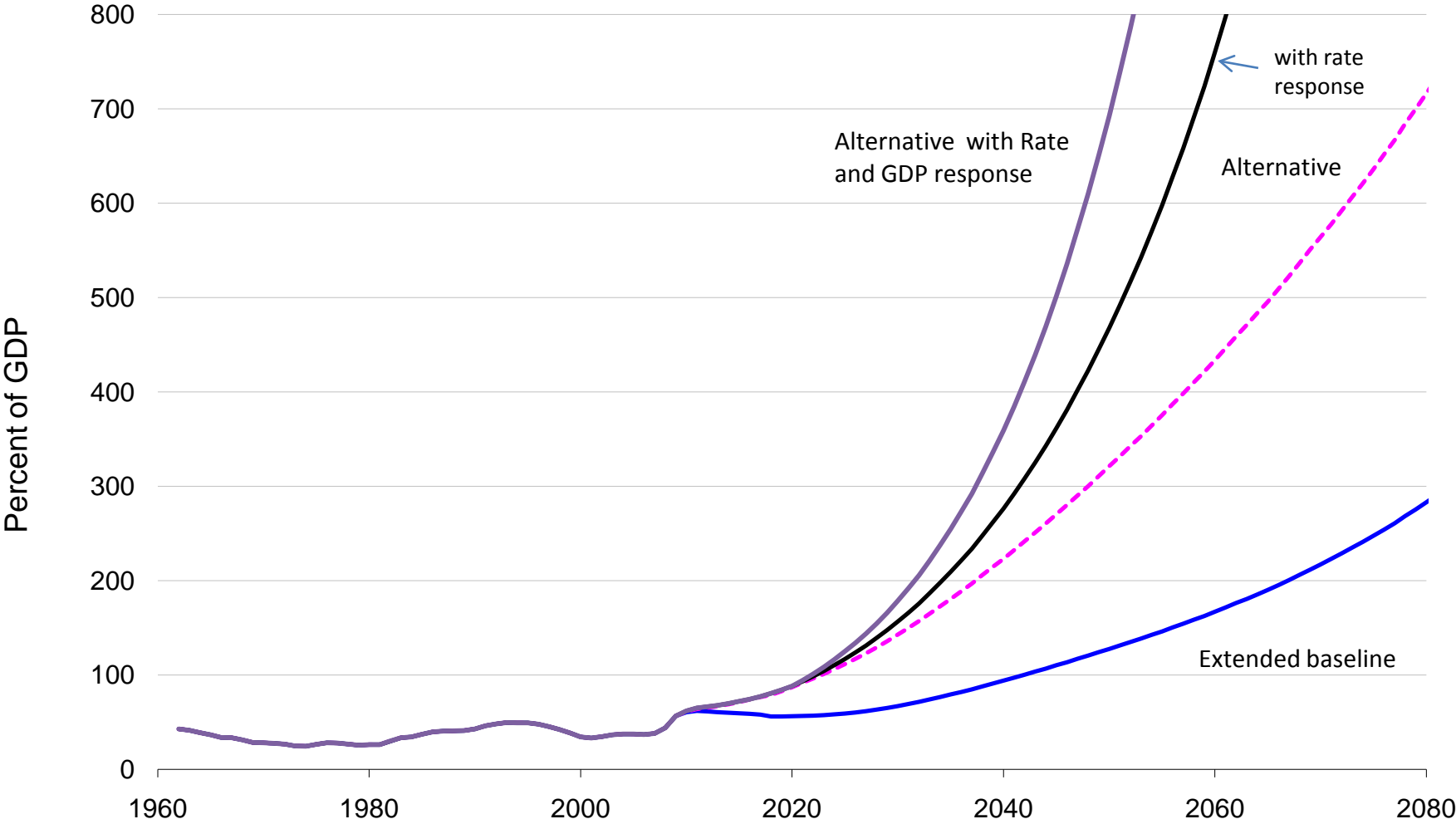
Source: CBO, "Preliminary Analysis of the President's Budget Request for 2011," March 5, 2010.

Figure 2, CBO Projections of Debt Held by the Public Under Alternative Scenarios, 1962-2083



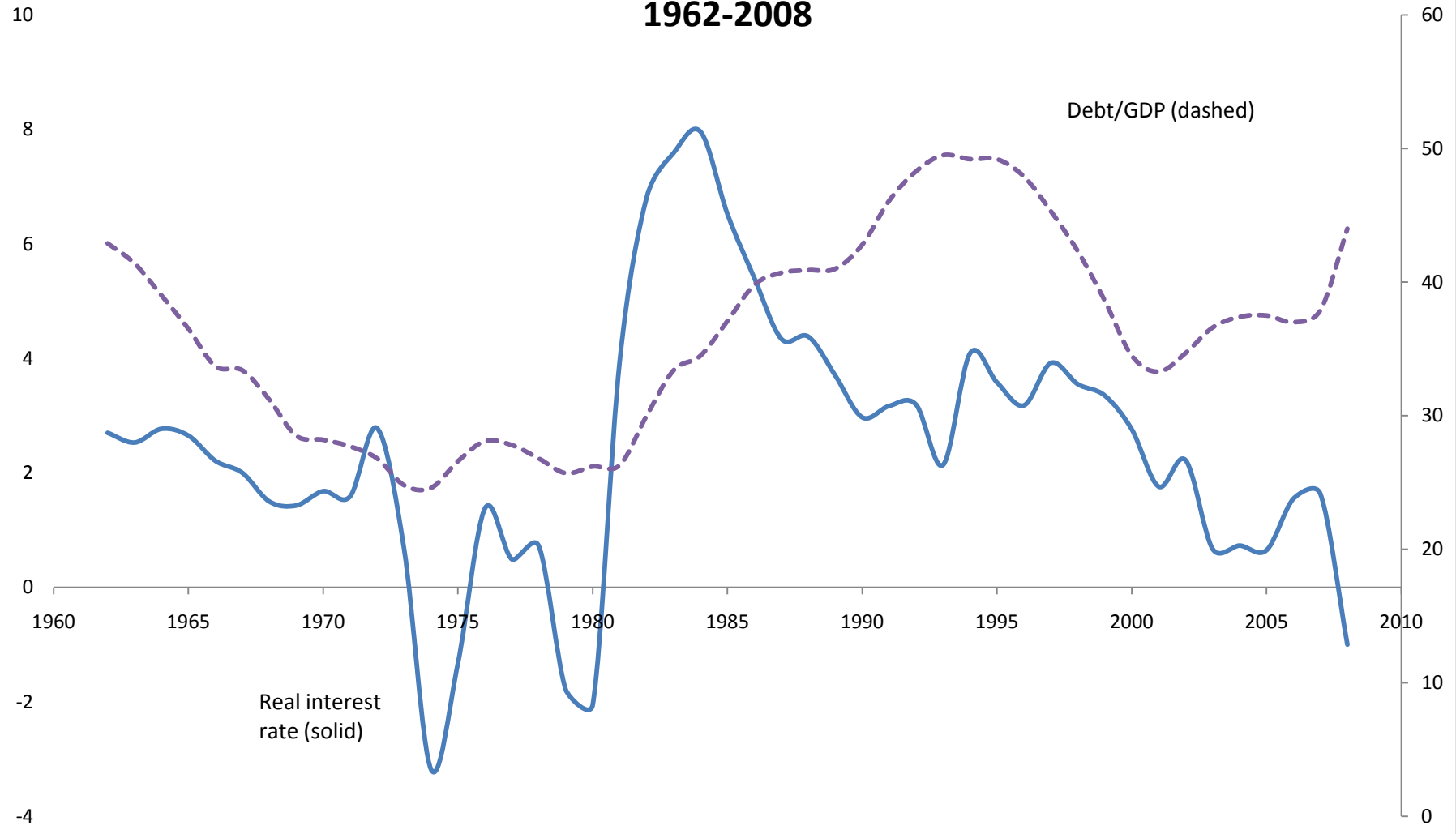
Source: CBO, 2009, Long-Term Budget Outlook

Figure 3. Alternative Projections of Debt Held by the Public, 1962-2080



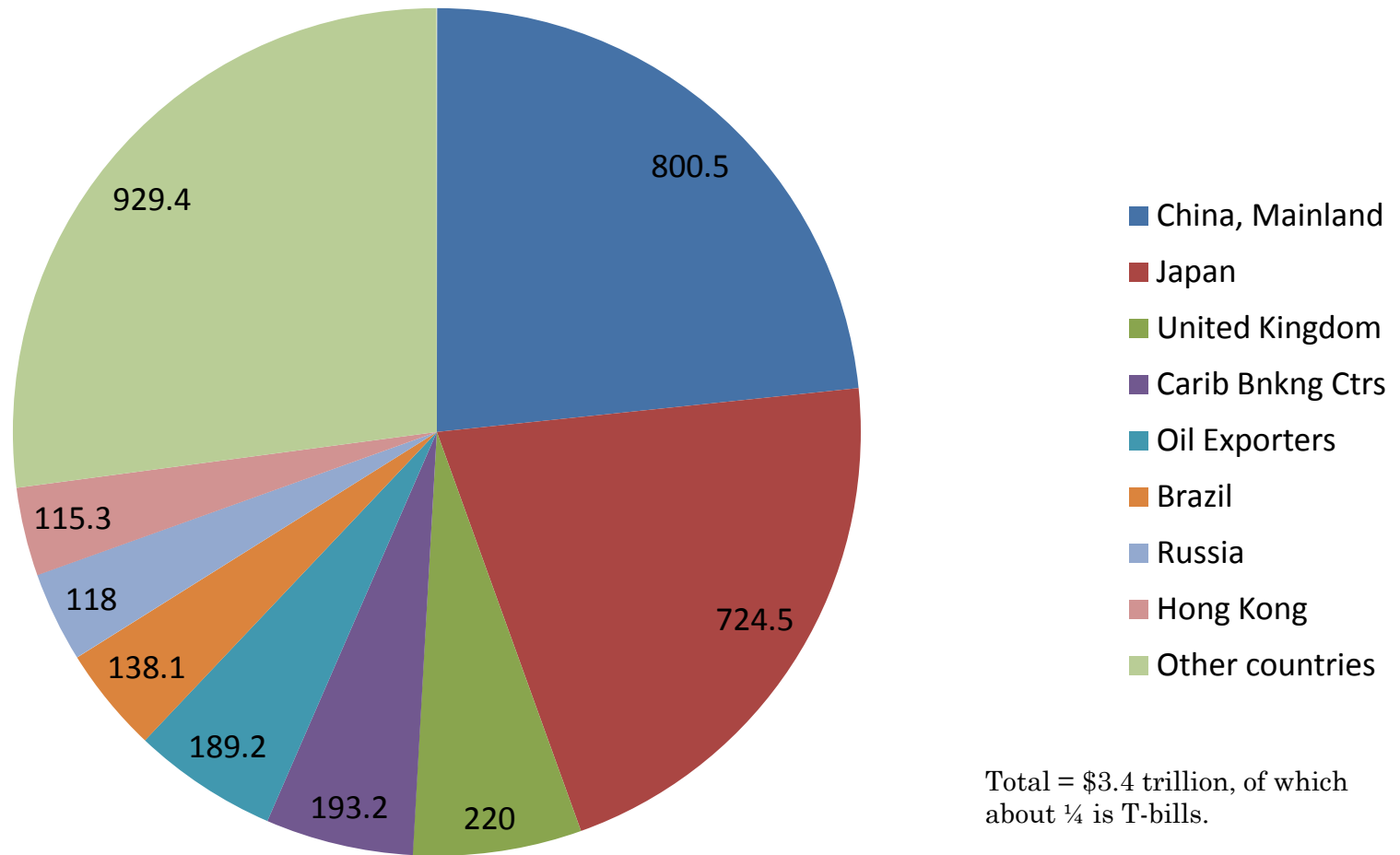
Source: CBO, 2009, Long-Term Budget Outlook

Figure 4. Debt versus Real Interest Rates on 5-year Treasury Bonds, 1962-2008



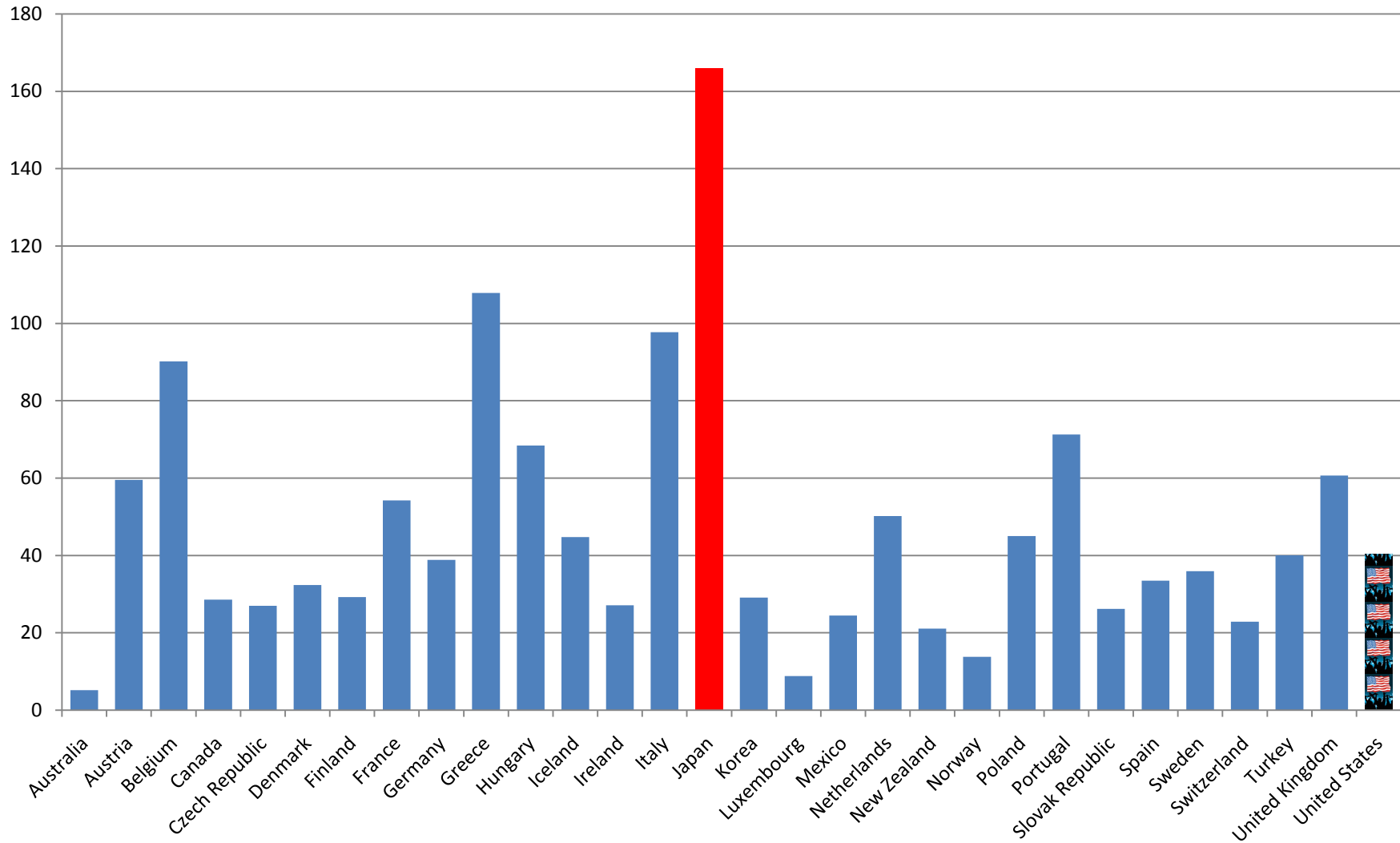
Source: <http://federalreserve.gov/releases/h15/data.htm> (12/12/09)

FIGURE 5. MAJOR FOREIGN HOLDERS OF US DEBT, IN \$BILLIONS, JULY 2009



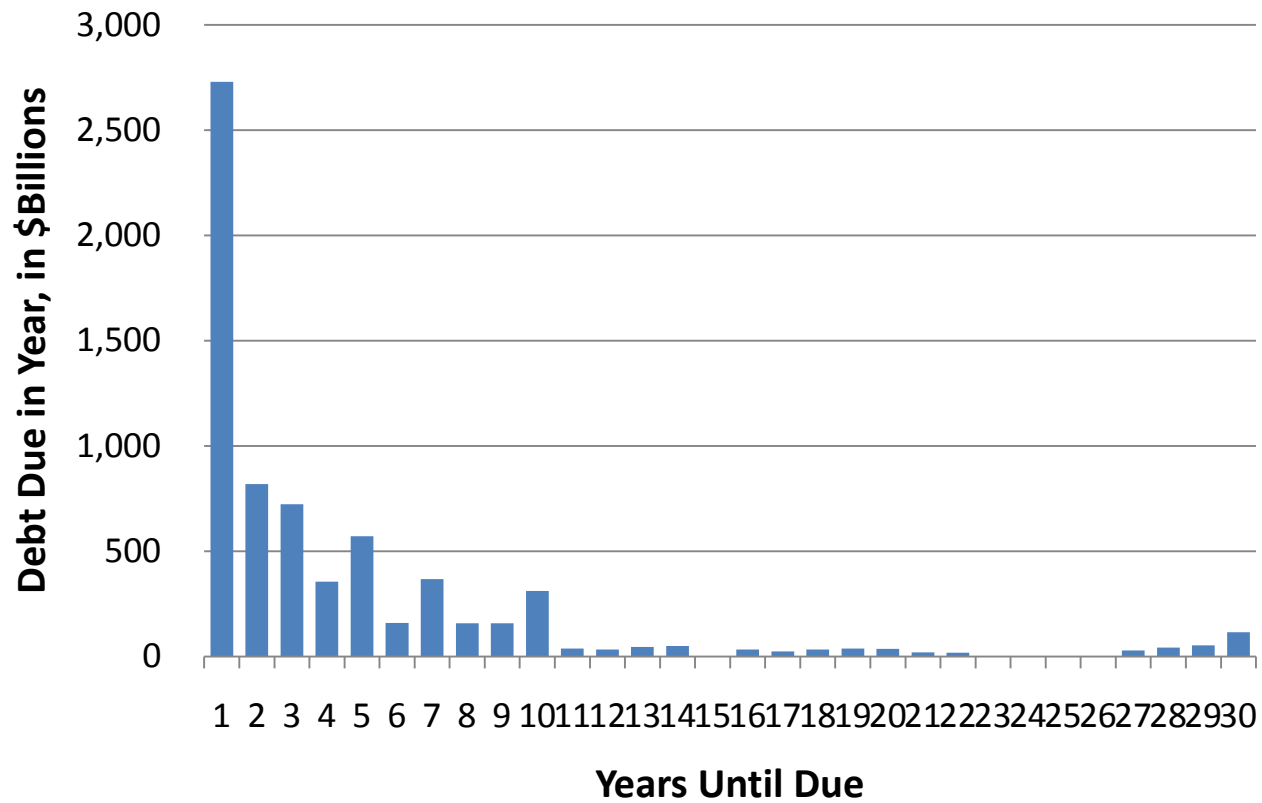
Source: US Treasury, "Major Foreign Holders of Treasury Securities," <http://www.treas.gov/tic/mfh.txt>

Figure 6. Debt as Percent of GDP in OECD Countries, 2008



Source: OECD Stat.Extracts. http://stats.oecd.org/Index.aspx?DataSetCode=GOV_DEBT

**Figure 7. Debt Held by Public, by Maturity in Years,
As of October 2009**



Source: US Treasury, Monthly Statement of the Public Debt (MSPD), October 2009,
<http://www.treasurydirect.gov/govt/reports/pd/mspd/2009/opdm102009.xls>, and author's calculations.