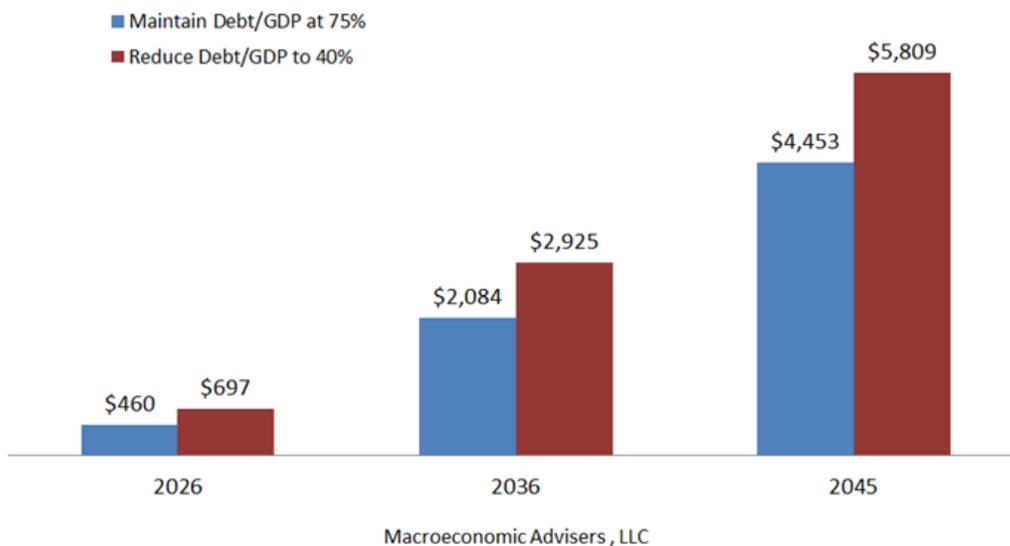


The Macroeconomic Gains from Stabilizing and Reducing Federal Debt*

Federal debt is on an unsustainable path. According to simulations presented in this paper, federal debt under current law is projected to climb from 76% of GDP in 2016 to 164% of GDP in 2045. Because rising budget deficits will be partly financed by borrowing from foreigners, U.S. fiscal policy will have significant implications for trade. Unless current laws are changed, the trade deficit is projected to climb from 2.7% of GDP in 2016 to 4.4% in 2045, while U.S. indebtedness to foreigners is projected to soar from 32% of GDP in 2016 to 112% of GDP in 2045.

This paper also finds that policies that stabilize or reduce federal debt as a share of the economy can produce large gains to real Gross National Product (GNP) per person. By 2045, stabilizing the debt would increase real GNP by roughly \$4,500 per person in today's dollars. Reducing the debt to 40% of GDP would raise real GNP by about \$5,800 per person. Moreover, these gains can be achieved without an increase in the unemployment rate provided that fiscal restraint is applied gradually so that the Federal Reserve has enough "monetary space" to offset the fiscal drag by lowering interest rates.

Gains in Real GNP/Capita by 2045
(2017 Prices)



*Prepared under commission by Macroeconomic Advisers, LLC. for the [Peter G. Peterson Foundation](#).

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Overview

Current fiscal policy is unsustainable. The Congressional Budget Office (CBO) projects that under today's policies of taxation and spending, the federal deficit will rise from 2.9% of GDP in fiscal year (FY) 2016 to 9.8% by FY 2047. Federal debt—already 76% of GDP in FY 2016 and the highest level since just after World War II—will be rising rapidly to 150% of GDP by FY 2047.¹ As the U.S. population ages, deficits and debt will be driven up by the escalating costs of the Social Security, Medicare and Medicaid programs that exceed the growth of revenues projected under current law. Moreover, net interest costs will mount rapidly as the debt grows and as the Federal Open Market Committee (FOMC) allows interest rates to rise after a period of exceptionally low rates.²

Secularly rising deficits and debt pose multiple threats to the U.S. economy. They “crowd out” private capital investment, reducing productivity and undermining the advance in our standard of living. To the extent they are financed by borrowing from abroad, persistent deficits imply the gradual transfer of ownership of U.S. assets to foreigners. Rising debt also pushes up federal interest costs, which will put pressure on other parts of the budget and make it more difficult to finance other national priorities.

In addition, large deficits and high debt could undermine the ability to conduct counter-cyclical fiscal policy during an economic downturn, to prosecute American interests overseas, or to respond to natural disasters at home. As the debt burden rises, future investors may lose confidence in the full faith and credit of the American government. That could result in a sovereign debt crisis that limits the Treasury's ability to borrow except at very high interest rates. Finally, if fiscal action is delayed and the United States experiences a fiscal crisis, there may not be enough “monetary space” for the FOMC to offset the adverse impact on economic growth of a large fiscal retrenchment that financial markets might force policymakers to undertake.

¹ The Congressional Budget Office, “The 2017 Long-Term Budget Outlook” (March 2017).

² In addition, under an unsustainable fiscal policy, the equilibrium interest rate will come under upward pressure.

Budget and trade deficits are intimately linked by macroeconomic identities. Tautologically, trade deficits are the excess of domestic investment over domestic saving, including government saving or, when there are budget deficits, dissaving. Burgeoning federal deficits can increase interest rates, which undermines domestic investment while encouraging domestic private saving. However, unless domestic investment and domestic private saving are very sensitive to interest rates—and we believe empirical evidence suggests they are not—rising budget deficits will be partly financed by rising external deficits.

Rising interest rates in the U.S. relative to rates abroad put upward pressure on the real exchange rate. That would make U.S. goods and services less competitive in global markets. The high dollar would discourage exports, while encouraging imports.

Both the resulting increase in U.S. indebtedness to foreigners and the relative rise in U.S. interest rates imply growing payments of income to the rest of the world. That would increase the current account deficit relative to the deficit on trade in goods and services alone.

These forces are practically independent of trade policies or “free-trade” agreements. Trade deficits cannot be materially reduced through higher tariffs. Instead, reducing them significantly requires an increase in domestic saving relative to domestic investment. And the surest way to increase national saving—and address our external imbalance—is to reduce our budget deficit.

Because federal deficits and debt are on unsustainable paths, U.S. trade deficits and indebtedness to the rest of the world are also on unsustainable trajectories. Unless action is taken, the U.S. economy is exposed to yet another risk arising from an unsustainable fiscal policy: foreigners eventually refusing to invest in the United States at the going exchange rate, which would cause a large depreciation of the dollar and, because of the dollar's central role as a reserve currency, possibly throw global exchange markets into chaos

The Model

The simulations reported here were developed using MacroEconomic Advisers' model of the U.S. economy, MA/US. The theoretical paradigm underlying the model is commonly referred to as the "neo-classical synthesis".

In the long run, potential GDP, or "aggregate supply," is determined by a Solow-type growth model that combines inputs of labor and capital services with total factor productivity (TFP) to produce output. Labor inputs depend mainly on population and the labor force participation rate. Population, including age / gender mix, is "exogenous" and based on projections published by the Bureau of the Census. The participation rate is modeled to depend primarily on the age / gender mix of the population, but it also has a cyclical component while being influenced by tax rates and economic variables. The capital-output ratio is, through investment spending, governed by taxes, the relative price of investment goods, and interest rates. TFP growth is set by assumption.

Near-term fluctuations in GDP and, hence, in utilization rates, depend on "aggregate demand": the sum of consumer spending, capital expenditures, net exports, and government purchases. Fiscal policy affects aggregate demand through spending and taxes. Monetary policy affects aggregate demand by influencing interest rates and asset prices. Discretionary federal spending is set by assumption. Mandatory federal outlays are driven by benefit formulas and demographics. Federal net interest payments are determined by the net stock of federal interest-bearing debt outstanding and the average cost of that debt. The latter adjusts towards market yields on Treasury instruments as outstanding debt matures and is refinanced at then-current interest rates. Short-term interest rates are determined by a Taylor-type monetary rule that raises the short-term yields when inflation rises relative to the FOMC's assumed 2% inflation objective, or the unemployment rate falls relative to the natural rate of unemployment.³ In addition, the "term premium" of Treasury yields over a forward average of expected short-term interest rates

depends on the size and composition of the Fed's balance sheet—that is, on "quantitative easing".

Nominal interest rates are subject to a "zero-bound" that introduces a potentially important asymmetry in the ability of the FOMC to respond to fiscal initiatives. In particular, in some instances there might not be enough "monetary space" for the FOMC to offset the drag of a fiscal retrenchment by lowering interest rates.

The model distinguishes between Gross Domestic Product (GDP) and Gross National Product (GNP). GDP is income earned by capital and labor situated in the United States, whether owned by foreigners or U.S. nationals. GNP is income earned by the capital and labor owned by U.S. nationals whether situated in the U.S. or overseas. The distinction is important because federal deficits can be financed by borrowing from foreigners. In that case, deficits are associated with a gradual transfer of ownership of national assets to the rest of the world, reducing GNP relative to GDP. Accordingly, GNP may be the preferable measure of U.S. income.

In the typical "supply-side" growth model, aggregate demand plays little role because flexible prices keep capital and labor fully employed and interest rates are determined by the marginal product of capital. In MA/US, near-term movements in interest rates are determined by the interplay between aggregate demand and aggregate supply. If fiscal policy is sustainable, this modeling distinction is of little long-run consequence. If, however, an unsustainable fiscal expansion systematically raises aggregate demand relative to aggregate supply, interest rates can rise steadily relative to the marginal product of capital with the result that federal net interest payments may increase faster than suggested by growth models, such as the type of model used by CBO in its long-term projections.

The "Do Nothing" Baseline

We began the analysis by using MA/US to construct a baseline from 2016 through 2045 under assumptions for the primary federal deficit, and for demographics, that are similar to those reported in the CBO's July 2016 Long-Term Budget Outlook.⁴ This baseline is summarized in Charts 1-4.⁵

³ The model uses an estimate of the "non-accelerating inflation rate of unemployment" (NAIRU) published by CBO.

Chart 1. Baseline Deficits

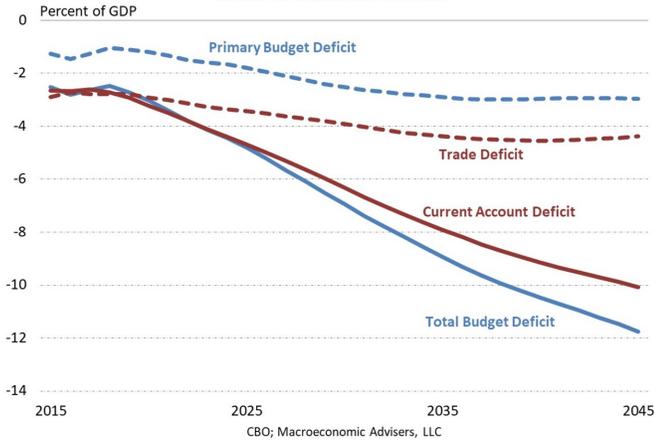


Chart 2. Baseline Debt

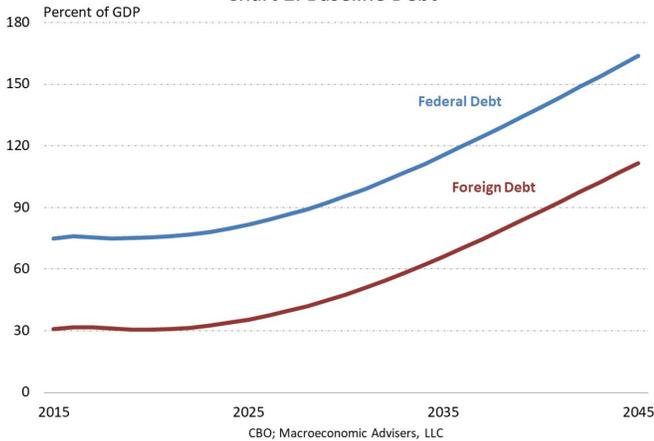


Chart 3. Baseline GDP & GNP per Capita

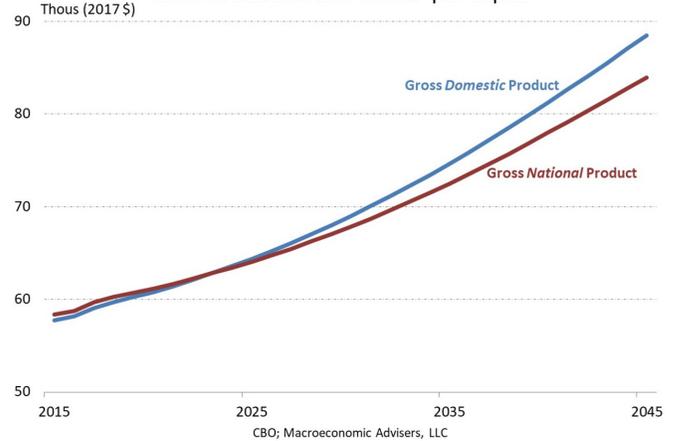
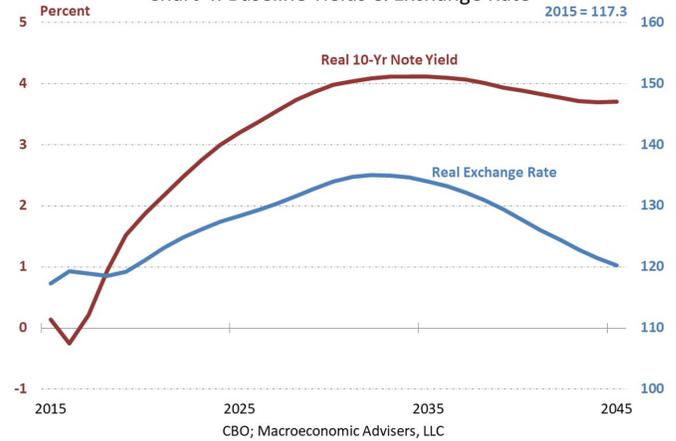


Chart 4. Baseline Yields & Exchange Rate



Discretionary spending is assumed to follow CBO’s 10-year projections, which adhere to the caps established under the Budget Control Act of 2011 (as later amended). After 2026, discretionary outlays are presumed to grow at roughly the same rate as GDP. The major entitlement programs are left on “autopilot”, with outlays determined by the number of beneficiaries (that is, primarily by demographics), current benefit formulas and, in the case of healthcare programs, an assumption about rising costs per beneficiary. Importantly, when the respective trust funds are exhausted, full Social Security and Medicare benefits are assumed to be paid out of general revenues, which is the same assumption that CBO uses in its projections.

⁴ Congressional Budget Outlook “The 2016 Long-Term Budget Outlook (July 2016). Although CBO released an updated set of long-term projections in March 2017, they are qualitatively similar to those from July 2016.

⁵ A full set of annual results for all the scenarios presented here is available upon request.

Taxes are extended (and certain provisions are assumed to expire) as scheduled under current law. Personal income taxes gradually rise relative to GDP as real “bracket creep” pushes taxpayers into higher marginal tax brackets, distributions of retirement accounts face taxation, and increasing income inequality shifts income into higher tax brackets. Other taxes remain relatively stable as a share of GDP.

When developing the baseline, monetary policy was adjusted to keep the economy close to full employment with inflation near 2%. Given the fiscal expansion in the baseline, this monetary stance implies rising real (and nominal) interest rates that “crowd out” private investment, gradually undermining the U.S. standard of living relative to the case of sustainable fiscal policy. Nevertheless, growth of GDP averages 2.1% through 2045. As discussed below, U.S. external indebtedness rises rapidly, so growth of GNP averages a slower 1.9%.

Because in MA/US the mechanism for determining interest rates is different than in the growth model that underlies CBO’s economic projections, we allowed interest rates—and hence interest payments and the overall (as opposed to the primary) deficit—to be determined by MA/US. As suggested above, in our simulations yields rise faster than shown by CBO, as do interest payments and total deficits. The difference in debt dynamics is consequential. For roughly the same path of primary deficits, our baseline simulation shows the average cost of federal debt rising to 5.6% by 2045, compared to 4.4% by CBO.

Under current law, our model projects that federal deficits will quadruple over the next 30 years, climbing from 2.8% of GDP in 2016 to 11.7% in 2045. In turn, federal debt will soar from 76% of GDP in 2016 to 164% in 2045.⁶ At that level, debt/GDP would be more than four times its average between 1967 and 2016.

There are two distinct phases in the evolution of the baseline deficit. During the first phase, the primary deficit rises from the recent 1.5% of GDP in FY 2016 to 3% of GDP by 2036. During the second phase, from 2036 through 2045, the primary deficit is stable as a share of GDP, but the overall deficit continues rising rapidly as interest payments accumulate. The steady expansion of the primary deficit over the first two decades is a persistent fiscal stimulus that put upwards cyclical pressure on interest rates necessary to prevent unemployment from falling and inflation from rising. This pressure abates when the primary deficit stabilizes, allowing interest rates to ease somewhat over the last 10 years of the baseline.

In our modeling both domestic investment and saving are relatively insensitive to interest rates in the short-run, so a significant share of the increasing debt must be financed by borrowing from abroad. The external financing of domestic budget deficits is enticed by rising U.S. yields, and the resulting inflow of foreign capital puts upwards pressure on the real exchange rate, especially in the first phase of the baseline when the

⁶ Like current fiscal policy, the baseline economic scenario of 2% growth and 2% inflation at full employment is not sustainable because interest rates are gradually rising. The mathematics of debt dynamics are that once the after-tax average cost of debt rises above the growth rate of nominal GDP, the process becomes explosive.

primary deficit is expanding. Consequently, the trade deficit rises from 2.7% of GDP in 2016 to 4.4% of GDP by 2036 before stabilizing.

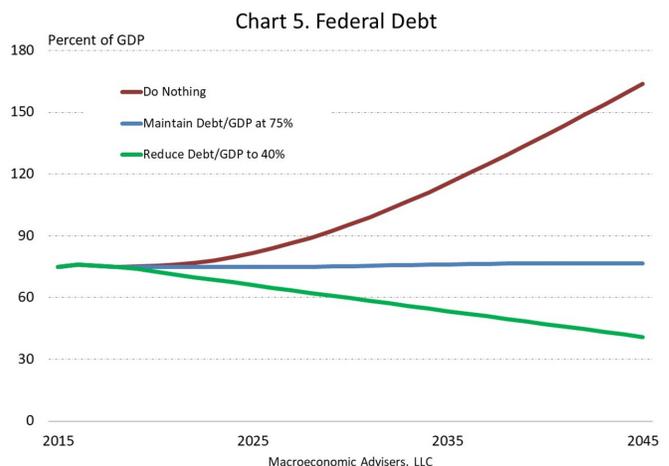
The current account deficit, which includes net income paid to the rest of the world, rises sharply throughout the entire 30-year period – climbing from 2.7% of GDP in 2016 to 10.1% of GDP in 2045. As a result, U.S. indebtedness to foreigners almost quadruples over the period, soaring from 31.7% of GDP in 2016 to 111.6% of GDP in 2045.⁷

Against this baseline, we then estimated the macroeconomic implications of attempting to achieve certain fiscal goals by 2045, using different combinations of spending restraint and revenue increases. The results of these scenarios are described below along with conclusions and implications.

Maintaining Debt at 75% of GDP

In three scenarios, gradual and steadily applied fiscal restraint is used to maintain the debt-to-GDP ratio close to its recent value of 75% all the way through 2045 (Chart 5):

- Scenario 1: “across-the-board” cuts in primary spending
- Scenario 2: “across-the-board” increases in revenues only



⁷ The measure of the trade deficit reported here is “net exports of goods & services” from the National Income & Product Accounts (NIPA). The current account deficit is measured by “net lending or borrowing from the rest of the world”, also from the NIPA.

TABLE 1.
MAINTAINING CURRENT DEBT/GDP RATIO - IMPACT IN 2045

	Extended Baseline	Scenarios				Average less Baseline
		(1)	(2)	(3)	Average	
Federal debt (% of GDP)	164%	76%	75%	76%	76%	-88%
Primary deficit (% of GDP)	3.0%	0.9%	0.9%	0.8%	0.9%	-2.1%
Total deficit (% of GDP)	11.7%	3.2%	3.2%	3.2%	3.2%	-8.6%
Real GDP per capita (2017 prices)	\$88,508	\$89,587	\$89,236	\$89,350	\$89,391	\$883
Real GNP per capita (2017 prices)	\$83,925	\$88,573	\$88,378	\$88,415	\$88,455	\$4,531
Interest rate on all federal debt	5.7%	3.3%	3.2%	3.2%	3.3%	-2.5%
Foreign debt (% of GDP)	112%	68%	66%	67%	67%	-45%
Trade deficit (% of GDP)	4.4%	3.3%	3.3%	3.3%	3.3%	-1.1%
Current account deficit (% of GDP)	10.1%	5.0%	4.7%	4.8%	4.8%	-5.2%

(1) Maintain debt/gdp at 75% through spending restraint only

(2) Maintain debt/gdp at 75% through spending restraint and revenue increases

(3) Maintain debt/gdp at 75% through revenue increases only

- Scenario 3: equal cuts in primary spending and increases in revenues

In each case, the FOMC is assumed to reduce interest rates with the goal—successfully achieved, as it turns out—of maintaining the economy close to full employment and inflation near 2%. The results of these scenarios by 2045 are summarized and compared to the baseline in Table 1.⁸ From these results we conclude:

First, the FOMC has ample “monetary space” to completely offset the fiscal drag resulting from these deficit reduction paths. Although the eventual fiscal adjustment is large, it occurs gradually enough in each of these three scenarios that the unemployment rate remains close to baseline levels. This result shows that a fiscal adjustment, even if ultimately large, can be implemented without necessarily creating slack in labor and product markets if it is started early enough.

Second, gradual deficit reduction delivers large economic gains. Across the average of the three scenarios,

real GNP per person grows, on average, about 0.2 percentage point faster per year than in the baseline. By 2045 this faster growth cumulates to a gain of \$4,531, or 5.4%, in the level of real income per person when measured at today’s prices. Most of the increase stems from the fact that smaller budget deficits require less borrowing from abroad. By 2045 indebtedness to foreigners is reduced by 45% of GDP, which, in turn, implies a smaller transfer of ownership and income to the rest of the world. The increase in real GDP per person – which excludes the benefits of reduced borrowing from abroad – averages only \$883 across the three scenarios. The modest impact on GDP stems in part from the long lags in the model between changes in interest rates and changes in the supply of capital services.⁹

Third, the impacts on GNP are broadly similar across the three scenarios. This suggests that from a macroeconomic standpoint, somehow addressing the current fiscal imbalance is more important than the particular mix of spending restraint or revenue increases in any

⁸ Because the paths of unemployment and inflation are practically identical to their baseline paths, and the changes in GDP accumulate fairly steadily, the table shows only the summary results for key fiscal variables by 2045. Full simulation results are available upon request.

⁹ In MA/US, the production function (for the private nonfarm business sector) is Cobb-Douglas, with a long-run elasticity of one between the capital-output ratio and the cost of capital which, in turn, depends on interest rates. However, given adjustment costs, several decades are required for the full response of the capital stock to a persistent change in interest rates.

fiscal “fix.” An implication is that in seeking a “grand bargain,” policymakers have flexibility to negotiate across a broad range of policy combinations without sacrificing much in the way of macroeconomic benefit. This, obviously, is helpful in terms of the politics of fiscal restraint.

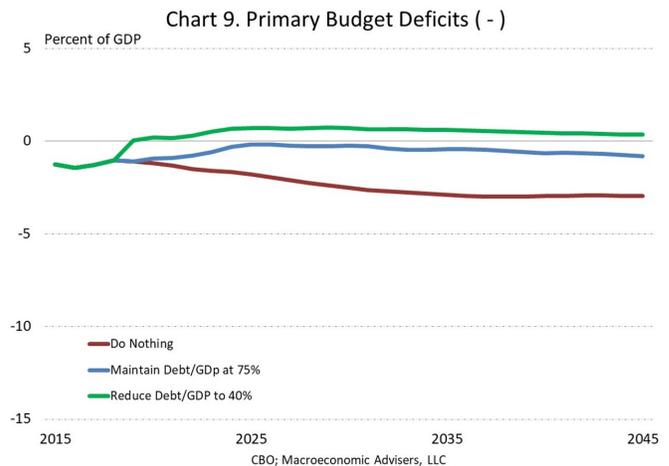
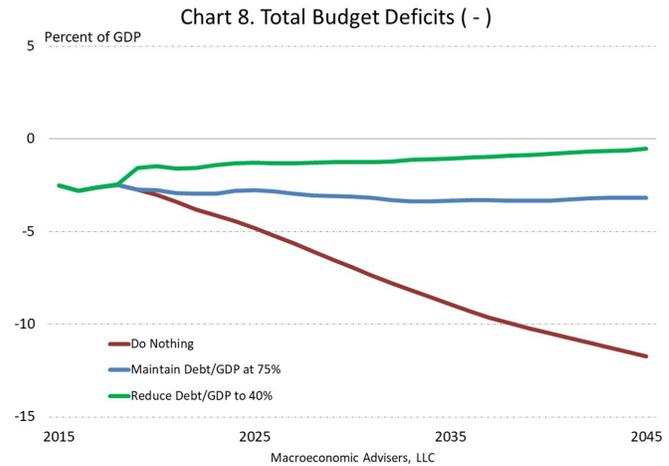
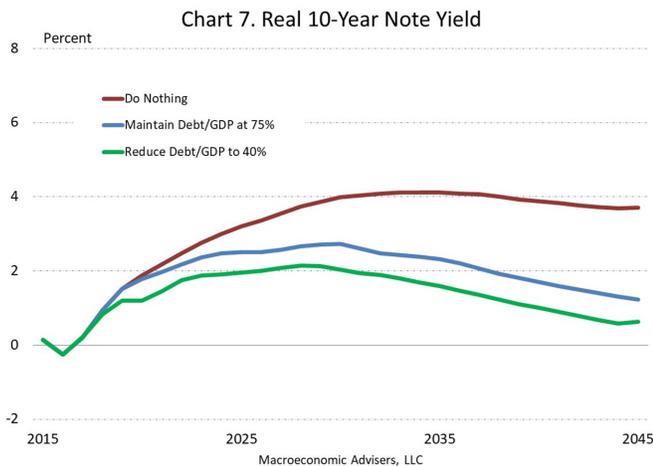
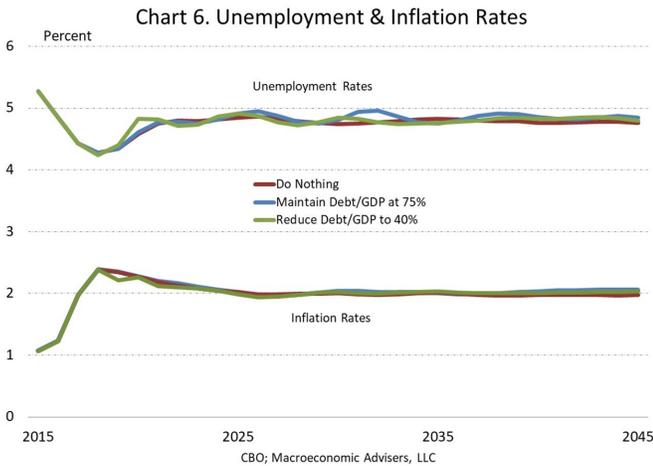
Fourth, most of the reduction in the deficit by 2045 is in interest expense. The baseline deficit in 2045 is 11.7% of GDP; the average across the three scenarios is 3.2%. Of that 8.6 percentage-point reduction, only 2.1 percentage points is in the primary deficit. The rest of the reduction (6.5 percentage points, not shown in the table) is in debt service. Not only is the volume of debt outstanding much lower, the average cost of federal debt is 2.5 percentage points lower by 2045, the result of the FOMC’s full offset of the impact on aggregate demand of the fiscal restraint.

Last, the simulation highlights the effects of fiscal restraint on reducing U.S. current-account deficits. Under these simulations, the current account deficit stabilizes near 4.8% of GDP in 2045, instead of soaring above 10% as it does under the baseline.

Reducing Debt to 40% of GDP

In this scenario, the debt-to-GDP ratio is reduced starting immediately at a steady and even pace until it reaches its historical average of roughly 40% in 2045. The fiscal restraint is achieved half with spending restraint, half with revenue increases. Again, the FOMC is assumed to reduce interest rates with the goal of maintaining the economy close to full employment and inflation near 2%.

The simulation shows that the FOMC could be successful in meeting these goals. Despite a substantial amount of sustained fiscal restraint, there is sufficient



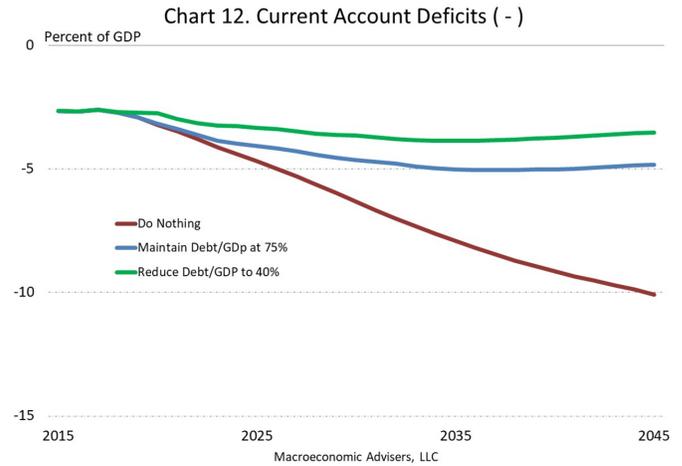
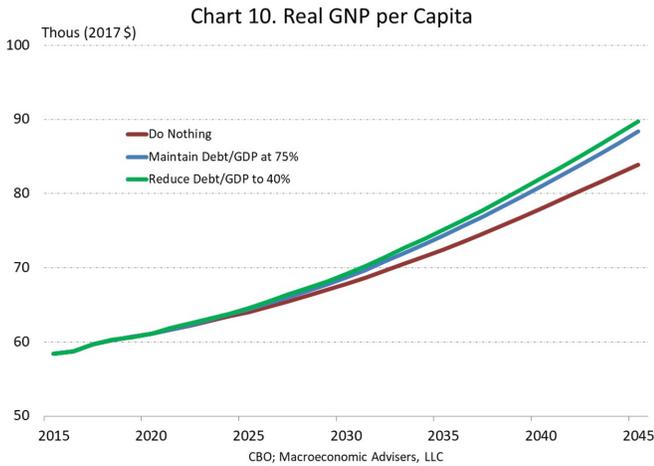
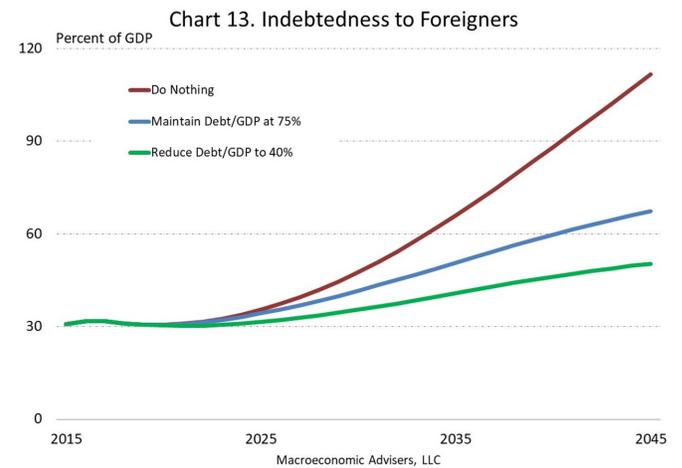
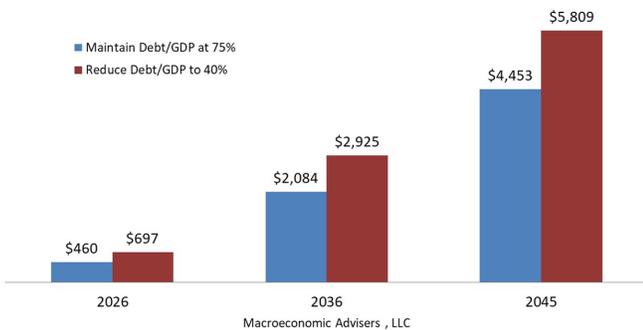


Chart 11. Gains in Real GNP/Capita by 2045 (2017 Prices)



monetary space that the FOMC can offset the fiscal drag—keeping the unemployment rate close to full employment (Chart 6, top) and inflation close to 2% (Chart 6, bottom)—albeit with lower real Treasury yields than in either the “do nothing” baseline or the case in which the debt-to-GDP ratio is maintained near 75% (Chart 7).

Not surprisingly, total deficits are smaller than in the other two scenarios (Chart 8). Reducing the debt/GDP ratio to 40% by 2045 would require running primary surpluses for three decades (Chart 9). However, because in this scenario interest expense falls sharply early on, by the last year of the simulation when the historical debt/GDP ratio is finally achieved, the primary deficit required to then stabilize the debt at roughly 40% of GDP after 2045 is the same as that required to maintain the debt at 75% of GDP.

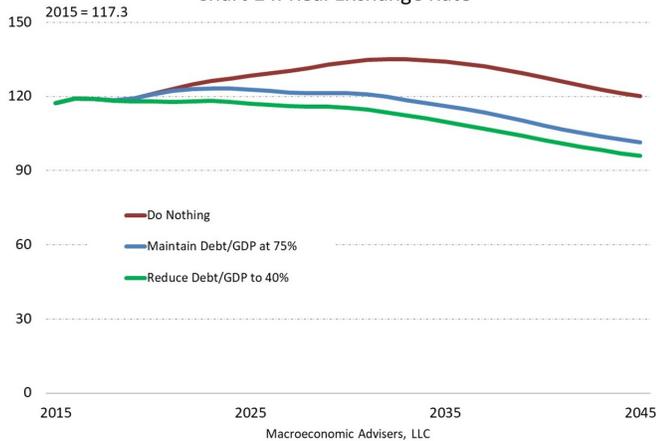
The increases in real GNP per capita are also large, but incrementally most of the gains occur from merely stabilizing the debt/GDP ratio near current levels, not reducing it (Chart 10). Still, by 2045, reducing the debt/GDP ratio to 40% raises real GNP by \$5,809 per person (Chart 11) relative to the baseline, a gain of 6.9%.

The current account deficit stabilizes near 5% of GDP in 2045 (Chart 12). Indebtedness to foreigners, however, continues to rise gradually, reaching 67% of GDP in 2045 (Chart 13), signaling that the exchange rate must continue to decline gradually relative to the baseline even after 2045 (Chart 14).

Summary and Conclusions

The results presented here suggest that a significant reduction in the federal debt relative to the size of the economy is possible without experiencing near-term

Chart 14. Real Exchange Rate



macroeconomic losses. To achieve such a reduction, deficit reduction must be applied gradually, leaving the Federal Reserve with enough “monetary space” to fully offset the associated fiscal drag by lowering interest rates significantly. Obviously, fiscal restraint should also be sensitive to changes in the business cycle. If the economy were to enter another recession, fiscal policy should be adjusted as needed to help bring the economy back to full employment.

The long-run macroeconomic gains from debt reduction are notable. Maintaining debt at 75% of GDP would increase real GNP per capita by nearly \$4,500 by 2045—a gain of 5.4%. Cutting budget deficits also works to improve the nation’s external balance by reducing our reliance on foreign saving while slowing the transfer of national assets to the rest of the world. The difficult political challenge of reducing deficits and the debt is made somewhat easier by this paper’s results that the mix of fiscal restraint is far less important than undertaking the fiscal restraint itself.

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