



The Daily Dish

Doing the Debt Arithmetic

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Eakinomics: Doing the Debt Arithmetic

The notion that the federal debt is far less of a threat than in the past has gained considerable momentum, ranging from the “no worries” from those on the extreme left hiding behind Modern Monetary Theory (MMT), to “you’ve got a lot more rope” from liberal policy advocates such as [Larry Summers](#) and [Jason Furman](#), to “this deserves a careful look” from scholars such as [Olivier Blanchard](#). My goal today is to sketch out what is going on.

First step, coffee!

Second step, let the ratio of debt to gross domestic product (GDP) at any point in time be $d_t = (D_t/Y_t)$, where D is debt and Y is GDP. Suppose the federal government exactly matches taxes and spending; i.e., the primary budget deficit is zero. Then the next year the debt will be higher only by borrowing to cover interest payments (with an interest rate of r); that is, $D_{t+1} = D_t + rD_t = (1+r)D_t$. In the same way, GDP will be higher by the amount of growth in GDP, so $Y_{t+1} = (1+g)Y_t$, where g is the growth rate of GDP. Collecting the results, the ratio of debt to GDP changes from $d_t = (D_t/Y_t)$ to $d_{t+1} = (D_{t+1}/Y_{t+1})$, or $d_{t+1} = (1+r)/(1+g) d_t$.

This is the key. If interest rates are higher than the growth rate of the economy, even running a primary budget balance will result in rising debt relative to GDP. But right now, interest rates are lower than the growth rate of GDP, so matching taxes and spending would mean debt falling relative to GDP. Put differently, if g is bigger than r , then you can run a primary deficit and still stabilize debt relative to GDP.

Third step. Using the Congressional Budget Office’s baseline budget projections, we can get a rough idea of the magnitudes. In 2018, d was 0.778 (debt in the hands of the public was 78 percent of GDP), r was 0.021 (measured as net interest payments as fraction of the debt), and g was 0.039 (the long-term nominal growth rate). The upshot is that if the goal were to stabilize the debt at 78 percent, the federal government could run a primary deficit of roughly 1.3 percent of GDP – \$272 billion. Of course, it didn’t. Instead it ran a primary deficit of 2.2 percent of GDP or \$454 billion. Debt-to-GDP, d_t , is still rising.

Final step. How big is the day of reckoning? All of this happy talk on the ease of carrying more debt does not change a fundamental identity:

$$d_t + (1+g)/(1+r)(p_{t+1}) + [(1+g)/(1+r)]^2(p_{t+2}) + [(1+g)/(1+r)]^3(p_{t+3}) + \dots \text{infinity} \dots = 0$$

where p is the primary deficit. Yes, you can run primary deficits for a while, but eventually, somewhere in the future, they have to become surpluses (negative p s) because no country can borrow an infinite amount forever. It’s also quite likely that as the debt burden mounts, interest rates will rise.

Suppose, in this example, the federal government continues for 40 years with primary deficits of 2.2 percent of GDP, growth of 3.9 percent and interest rates of 2.2 percent. Debt to GDP will rise to over 200 percent of GDP.

How big of a course correction is then needed?

If interest rates rise to 5 percent, the federal government would have to run a primary surplus averaging 0.8 percent of GDP for the rest of time. More troubling is that such a large debt load is incredibly sensitive to interest rates. If rates averaged 6 percent, the surplus would have to be 4.1 percent of GDP forever.

The moral is simple. It is true that low interest rates and/or high growth rates can buy time in dealing with a fiscal reckoning. But for the United States, the federal budget is so far out of whack that the ultimate adjustment is still too severe to imagine. Worse, playing the waiting game is tantamount to a dice roll on low interest rates that is very costly to lose.