



Financial Engineering: The Simple Way to Reduce Government Debt Burdens

BY DEAN BAKER AND SHEVA DIAGNE*

For more than three years governments around the world were warned away from taking stronger steps to boost their economy out of the downturn because of fears of crossing a 90 percent government debt-to-Gross Domestic Product (GDP) cliff. The argument was that countries with debt-to-GDP ratios above this threshold experience sharply slower growth.¹ More recent research has shown that the original analysis relied on both a spreadsheet error and a dubious aggregation method.² When correct data are used with alternative aggregation methods there is no sharp falloff in growth rates near a 90 percent threshold. Further research has shown that the negative relationship between debt levels and growth is driven almost entirely by causation from low growth to high debt.³

Nonetheless the concern over high debt levels has hardly disappeared from policy debates. The Bank of International Settlements recently released a paper warning of the dangers of debt-to-GDP ratios in excess of 80 percent.⁴ The Labour Party in the United Kingdom announced that if it were to return to office in the next round of elections that it would pay for any new spending programs with cuts elsewhere rather than through additional borrowing. And in the United States there has been little interest in re-examining a budget path that is cutting spending in large areas of the budget and also slowing growth, according to the assessment of the Congressional Budget Office (CBO)⁵ and many private forecasters.

Since a high debt-to-GDP ratio is still viewed as a serious problem in policy circles, it is worth showing the extent to which it is an arbitrary measure that could not possibly have an impact on economic outcomes. As has been noted, one way to quickly reduce debt-to-GDP ratios is through asset sales.⁶ Governments hold a wide variety of assets, the most important of which is the ability to tax. If the United States were to auction off carbon emissions permits (in effect, selling off the revenue stream from a carbon tax) it could quickly raise several trillion dollars, reducing its debt-to-GDP ratio by more than 10 percentage points. While selling assets may not be an optimal policy under other circumstances, if a government faced some sort of crisis due to an outsized debt-to-GDP ratio, this would be a quick and relatively painless remedy.

Another overlooked possibility for reducing a high debt burden is simply

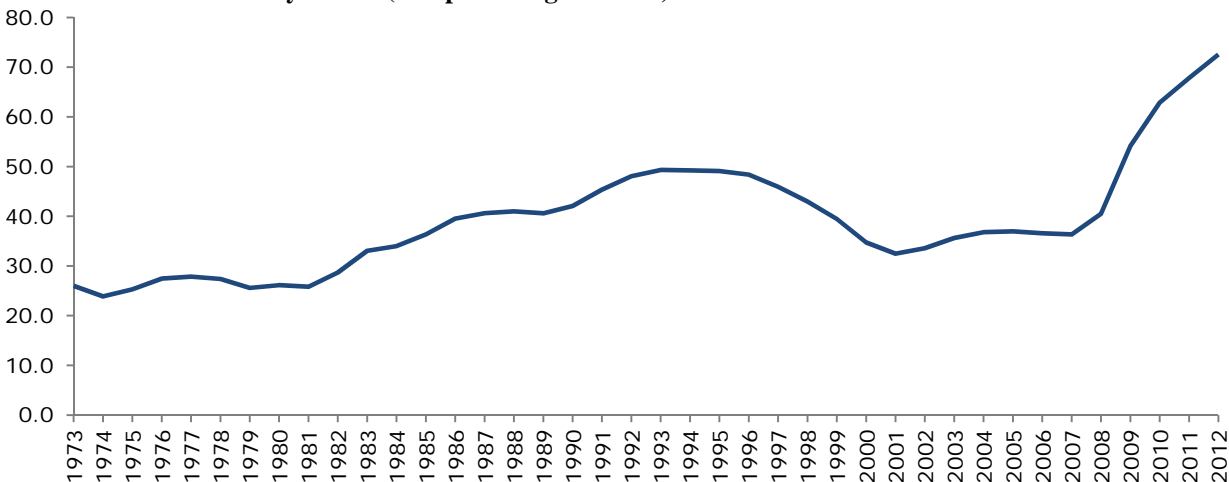


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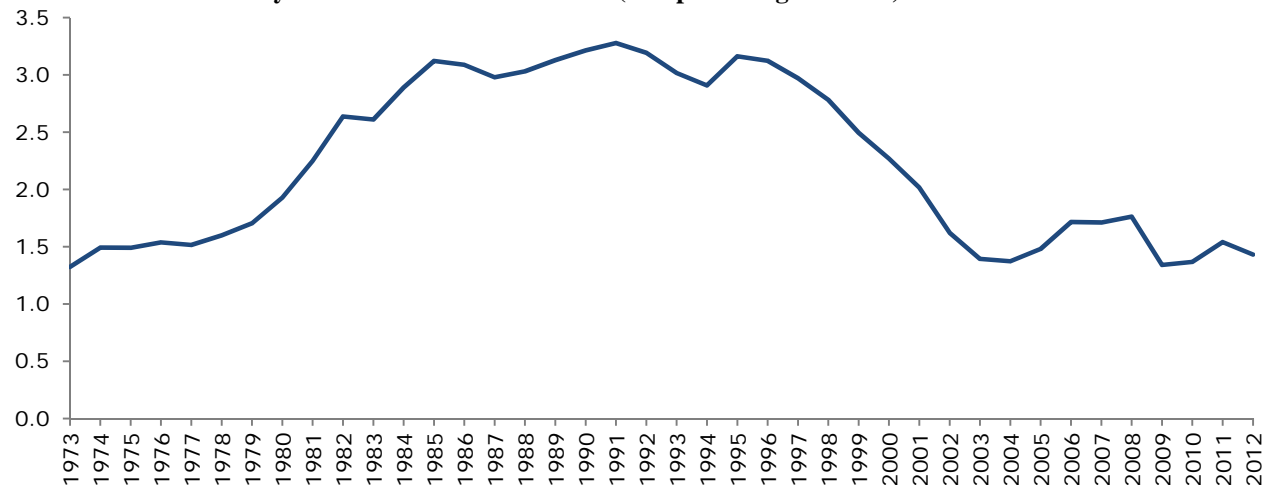
buying back bonds at a discount when interest rates rise, as is widely predicted. The point here is straightforward. Long-term bonds that are issued at low interest rates will sell at substantial discounts to their face value if market interest rates rise. If the concern is simply the ratio of debt-to-GDP then there should be substantial opportunities for this sort of debt reduction in the United States, as well as other countries. While the debt-to-GDP ratio has risen to levels that the country has not seen since the years immediately following World War II, the ratio of interest payments to GDP is actually at historically low levels.⁷

FIGURE 1a
U.S. National Debt Held by Public (as a percentage of GDP)



Source: Congressional Budget Office.

FIGURE 1b
Annual Net Interest Payments on U.S. National Debt (as a percentage of GDP)



Source: Congressional Budget Office.

This issue brief calculates the potential savings to the government through a hypothetical buyback of government debt in 2017. The calculations assume the structure of interest rates projected by the CBO for 2017.⁸ Based on the projection of a 3.5 percent interest rate on 90-day debt and 5.0 percent interest rate on 10-year Treasury bonds, we interpolated the set of interest rates shown in **Table 1** below.

TABLE 1
Projected Interest Rates for 2017

	Interest Rate
90-day	3.5
180 days	3.62
1-year	4
2-year	4.1
3-year	4.25
5-year	4.5
7-year	4.7
10-year	5
15-year	5.17
20-year	5.35
25-year	5.52
30-year	5.7

Source: Congressional Budget Office Baseline Economic Projections, Feb. 2013,
<http://www.cbo.gov/publication/43902>

We then used a simple bond calculator⁹ to project out the market value of debt issued as of the end of February 2013, to determine the potential savings to the government from buying back bonds at their market value in 2017. For simplicity, inflation indexed bonds were assumed to carry a nominal yield 2.0 percentage points above their indexed value. This is in keeping with current expectations for inflation.

Table 2 lists each issue included in the calculation and the projected discount to face value. The calculation adjusts for the years until maturity assuming that the calculation is made on July 1, 2017. [The calculations shown are for publicly held marketable debt.]

The face value of the debt in Table 2 is \$3,857 billion. The projected market value of this debt is \$3,399 billion for an implied debt reduction of \$458 billion, or just under 2.3 percent of the GDP projected for 2017. For purposes of comparison, this is slightly higher than the projected reduction in domestic or defense spending for the years 2013-2021 as a result of the sequester.

It is worth noting that this figure is almost certainly a considerable understatement of the amount of potential savings from buying back debt at discount. The Treasury Department is continuing to issue debt at interest rates that are substantially lower than those projected for 2017. The long-term debt issued in the rest of 2013, 2014, and 2015 will be selling at a substantial discount in 2017, if CBO's interest rate projections prove accurate.

The other factor worth noting is that the savings would be substantially higher if interest rates rose more than is projected, as has been predicted by some analysts. For example, a 10-year bond issued in 2013 at a yield of 1.8 percent will sell for 5.0 percent less than indicated in Table 2 if the interest rate on 10-year bonds in 2017 is 6.0 percent instead of the projected 5.0 percent rate. The market value will be 10 percent less than what is shown in Table 2 if the interest rate on 10-year bonds is 7.0 percent in 2017. In other words, the higher the interest rates in the next four years, the greater will be the opportunity for reducing the debt through this sort of debt arbitrage.

TABLE 2
Debt Issues That Will be Selling at Discounts, 2017

Interest Rate	Issue Date	Payable	Book Value (\$ millions)	Market Value (\$ millions)	Potential Saving (\$ millions)
9.125	05/16/88	05/15/18	6,717	6,487	230
5.500	08/17/98	08/15/28	11,776	11,585	191
5.250	11/16/98	11/15/28	10,947	10,542	405
5.250	02/16/99	02/15/29	11,350	10,924	427
5.375	02/15/01	02/15/31	16,428	15,930	498
4.500	02/15/06	02/15/36	26,397	22,815	3,582
4.750	02/15/07	02/15/37	16,589	14,755	1,835
5.000	08/15/07	05/15/37	21,413	19,655	1,758
3.500	02/15/08	02/15/18	39,205	38,875	329
4.375	02/15/08	02/15/38	22,525	18,955	3,570
3.875	05/15/08	05/15/18	34,078	33,744	334
4.000	08/15/08	08/15/18	36,803	36,394	409
4.500	08/15/08	05/15/38	25,500	21,815	3,685
3.750	11/17/08	11/15/18	57,351	56,394	958
2.750	02/17/09	02/15/19	58,677	56,617	2,060
3.500	02/17/09	02/15/39	25,909	18,877	7,032
3.125	05/15/09	05/15/19	64,411	62,253	2,158
4.250	05/15/09	05/15/39	38,779	31,841	6,938
3.625	08/17/09	08/15/19	66,753	64,911	1,842
4.500	08/17/09	08/15/39	41,431	35,262	6,169
3.375	11/16/09	11/15/19	71,037	68,473	2,564
4.375	11/16/09	11/15/39	44,564	37,193	7,371
3.625	02/16/10	02/15/20	71,595	69,705	1,890
4.625	02/16/10	02/15/40	44,902	38,845	6,057
3.500	05/17/10	05/15/20	68,219	65,504	2,715
4.375	05/17/10	05/15/40	43,473	36,204	7,269
2.625	08/16/10	08/15/20	67,850	63,236	4,614
3.875	08/16/10	08/15/40	43,213	33,209	10,004
2.625	11/15/10	11/15/20	67,410	62,496	4,914
4.250	11/15/10	11/15/40	42,903	34,970	7,933
2.625	01/31/11	01/31/18	29,578	28,992	586
3.625	02/15/11	02/15/21	67,585	64,544	3,041
4.750	02/15/11	02/15/41	43,005	37,767	5,238
2.750	02/28/11	02/28/18	30,593	30,153	441
2.875	03/31/11	03/31/18	30,300	29,903	397
2.625	05/02/11	04/30/18	30,830	30,318	512
3.125	05/16/11	05/15/21	65,998	61,695	4,303
4.375	05/16/11	05/15/41	41,996	34,827	7,169
2.375	05/31/11	05/31/18	31,441	30,800	641
2.375	06/30/11	06/30/18	29,934	29,269	665
2.250	08/01/11	07/31/18	29,864	29,108	756
2.125	08/15/11	08/15/21	66,735	59,674	7,061
3.750	08/15/11	08/15/41	42,489	31,760	10,728
1.500	08/31/11	08/31/18	29,886	28,826	1,061
1.375	09/30/11	09/30/18	29,903	28,722	1,181
1.750	10/31/11	10/31/18	30,103	28,980	1,123
2.000	11/15/11	11/15/21	70,092	61,941	8,152
3.125	11/15/11	11/15/41	44,622	29,745	14,877
1.375	11/30/11	11/30/18	30,314	28,962	1,352
1.375	01/03/12	12/31/18	29,939	28,529	1,410
1.250	01/31/12	01/31/19	29,546	28,024	1,522
2.000	02/15/12	02/15/22	74,200	65,133	9,067
3.125	02/15/12	02/15/42	47,219	31,320	15,899
1.375	02/29/12	02/28/19	29,407	27,875	1,532
1.500	04/02/12	03/31/19	29,688	28,127	1,562
1.250	04/30/12	04/30/19	29,779	28,013	1,766
1.750	05/15/12	05/15/22	68,985	59,423	9,561
3.000	05/15/12	05/15/42	43,919	28,341	15,578

TABLE 2 continued

Interest Rate	Issue Date	Payable	Book Value (\$ millions)	Market Value (\$ millions)	Potential Savings (\$ millions)
1.125	05/31/12	05/31/19	28,999	27,140	1,859
1.000	07/02/12	06/30/19	29,296	27,272	2,024
0.875	07/31/12	07/31/19	29,000	26,845	2,155
1.625	08/15/12	08/15/22	66,000	56,074	9,926
2.750	08/15/12	08/15/42	41,995	25,647	16,349
1.000	08/31/12	08/31/19	29,000	26,837	2,163
1.000	10/01/12	09/30/19	29,000	26,758	2,242
1.250	10/31/12	10/31/19	29,000	26,837	2,163
1.625	11/15/12	11/15/22	66,000	55,651	10,349
2.750	11/15/12	11/15/42	41,994	25,570	16,424
1.000	11/30/12	11/30/19	29,000	26,602	2,398
1.125	12/31/12	12/31/19	29,000	26,608	2,393
0.875	01/31/13	01/31/18	35,000	34,286	714
1.375	01/31/13	01/31/20	29,000	26,706	2,294
2.000	02/15/13	02/15/23	66,001	56,437	9,564
3.125	02/15/13	02/15/43	42,000	27,598	14,402
0.750	02/28/13	02/28/18	35,000	34,157	844
1.250	02/28/13	02/29/20	29,000	26,547	2,453
0.750	04/01/13	03/31/18	35,000	34,052	949
1.125	04/01/13	03/31/20	29,001	26,382	2,619
0.625	04/30/13	04/30/18	35,000	33,915	1,085
1.125	04/30/13	04/30/20	29,000	26,309	2,691
1.750	05/15/13	05/15/23	24,000	20,088	3,912
2.875	05/15/13	05/15/43	16,000	9,955	6,045
1.000	05/31/13	05/31/18	35,000	33,922	1,078
1.375	05/31/13	05/31/20	29,000	26,428	2,572
Inflation Indexed					
3.625	04/15/98	04/15/28	24,152	20,559	3,594
3.875	04/15/99	04/15/29	27,604	23,781	3,823
3.375	10/15/01	04/15/32	6,572	5,248	1,324
2.375	07/30/04	01/15/25	34,575	28,753	5,822
2.000	01/31/06	01/15/26	23,454	18,580	4,874
2.375	01/31/07	01/15/27	19,023	15,028	3,995
1.625	01/15/08	01/15/18	18,239	17,898	341
1.750	01/31/08	01/15/28	17,370	12,878	4,492
1.375	07/15/08	07/15/18	16,158	15,567	591
2.125	01/15/09	01/15/19	15,979	15,313	666
2.500	01/30/09	01/15/29	15,340	11,962	3,378
1.875	07/15/09	07/15/19	16,544	15,573	971
1.375	01/15/10	01/15/20	20,421	18,726	1,695
2.125	02/26/10	02/15/40	16,337	10,164	6,174
1.250	07/15/10	07/15/20	34,556	31,069	3,487
1.125	01/31/11	01/15/21	39,025	34,374	4,652
2.125	02/28/11	02/15/41	25,492	15,700	9,791
0.625	07/29/11	07/15/21	37,012	31,427	5,585
0.125	01/31/12	01/15/22	42,452	34,569	7,883
0.750	02/29/12	02/15/42	23,823	10,966	12,857
0.125	07/31/12	07/15/22	41,495	33,084	8,411
0.125	01/31/13	01/15/23	41,342	32,284	9,058
0.625	02/28/13	02/15/43	9,111	4,001	5,111
0.125	04/30/13	04/15/18	18,119	17,496	623
TOTAL			3,856,641	3,398,858	457,784

Source: Treasury Direct, May 2013, <http://www.treasurydirect.gov/govt/reports/pd/mspd/2013/opdx052013.xls>.

Of course exchanging debt in this manner serves no obvious purpose. The interest burden on the Treasury will not change through these transactions. The only effect will be to lower the official value of outstanding debt. However if there is some reason to believe that a high ratio of debt-to-GDP slows growth, with debt measured at its book value, then this sort of debt exchange would be an effective policy to address this problem.

At this point, there seems little obvious reason that the United States or other countries should be especially concerned about their debt-to-GDP ratios. However if people in policy positions continue to attach importance to this number then this sort of debt exchange should rank high on the list of policy options. There is no less costly way to eliminate close to half a trillion dollars in debt.

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- 1 Reinhart, Carmen and Ken Rogoff. 2010. "Growth in a Time of Debt." NBER Working Paper # 15639. Cambridge, MA: National Bureau of Economic Research. Available at <http://www.nber.org/papers/w15639>.
 - 2 Herndon, Thomas, Peter Ash, and Robert Pollin. 2013. "Does High Debt Consistently Stifle Economic Growth: A Critique of Reinhart and Rogoff." Amherst, MA: Political Economy Research Institute, University of Massachusetts. Available at <http://www.peri.umass.edu/236/hash/31e2ff374b6377b2ddec04deaa6388b1/publication/566/>.
 - 3 Dube, Arindajit. 2013. "Growth in a Time Before Debt." Next New Deal, Roosevelt Institute. April, 17, 2013. Available at <http://www.nextnewdeal.net/rortybomb/guest-post-reinhartrogoff-and-growth-time-debt>.
 - 4 Bank of International Settlements. 2013. *Annual Report, 2012-2013*. Basel, Switzerland: Bank of International Settlements. Available at <http://www.bis.org/publ/arpdf/ar2013e.htm>.
 - 5 Congressional Budget Office. 2013b. *Macroeconomic Effects of Alternative Budgetary Paths*. Washington, DC: Congressional Budget Office. Available at <http://www.cbo.gov/publication/43769>.
 - 6 Baker, Dean. 2013. "Reinhart-Rogoff, Debt, and Assets." Beat the Press, Center for Economic and Policy Research. May 28, 2013. Available at <http://www.cepr.net/index.php/blogs/beat-the-press/reinhart-rogoff-debt-and-assets>.
 - 7 If the \$78 billion in interest payments refunded by the Fed to the Treasury is netted out (Congressional Budget Office, 2013a. *Budget and Economic Outlook: Fiscal Years 2013-2023*. Washington, DC: Congressional Budget Office. Table 4-1), then interest payments would actually be less than 1.0 percent of GDP for 2013.
 - 8 Congressional Budget Office, 2013c. *Budget and Economic Outlook: Fiscal Years 2013-2023, Baseline Economic Forecast, February, 2013 Baseline Projections*. Washington, DC: Congressional Budget Office, available at http://www.cbo.gov/sites/default/files/cbofiles/attachments/43902_EconomicBaselineProjections.xls.
 - 9 The calculator used is available at <http://www.smartmoney.com/calculator/bonds/bonds-calculator--bonds--bond-funds-1309988621833/>.