

The Federal Budget Deficit and the National Debt

G. Sunny

1. Introduction

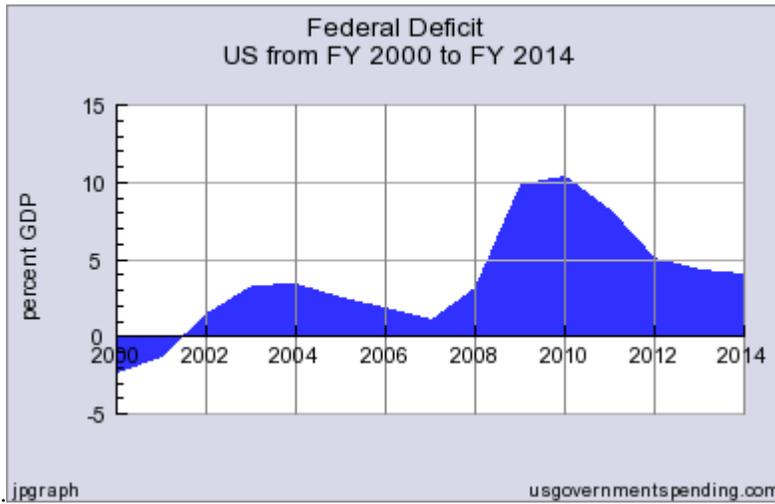
If the expected rate of return (roi, denoted by r) exceeds the expected cost of borrowing the investment funds (interest rate, denoted as, i), federal budget deficit is justified irrespective of the fact that deficit financing through the sale of Treasuries will trigger “crowding out”. Whereas each annual budget deficit adds to the public debt, any budget surplus will lower it. Subject to the above theoretical framework, it is possible that “crowding out” will be substantial to the detriment of the robust health of the economy when $r < i$, emanating from the wrong forecast on the expected cost benefit analysis (CBA) of the projects to be funded by deficit finance. Sometimes, the nature of some of these projects may not yield to the standard practice of CBA, warranting the use of shadow pricing and one could very well fathom out the pitfalls in shadow pricing along with the possibility of flawed forecasts and sensitivity analyses. Long run macroeconomic effects of higher budget deficit include constant real gross domestic product (RGDP) at the full employment level.

This paper is an attempt to trace the behavior of the federal budget deficit and the national debt during the period 2000-2014 in the US economy. Ten questions in the following order in section 2 are answered with the requisite tables and graphs. Apart from this section on introduction, this paper deals with answers to ten questions in section 2 that fill the bulk of the write up, followed by conclusion.

2. Answers to ten questions

Question 1. Depict the last 15 years of the Federal budget deficit and the national debt on separate graphs.

Graph 2.1.1 US Federal Budget Deficit 2000-2014



Source: USgovernmentspending.com, Federal Deficit FY 2000-2014, retrieved 3/8/15

Table 2.1.1 US Federal Budget Deficit 2000-2014

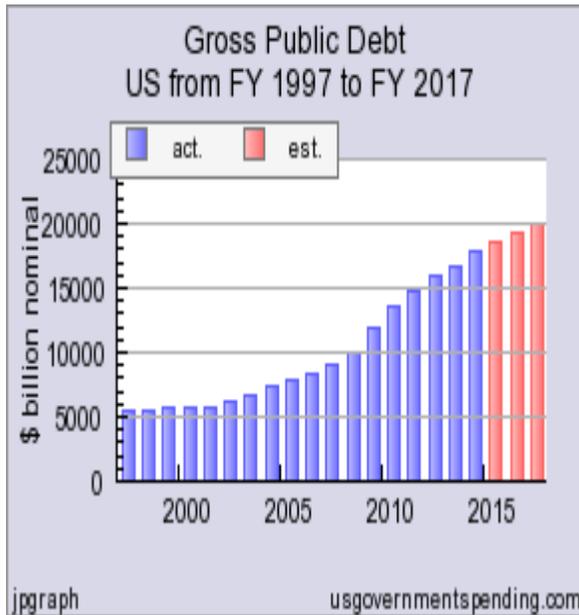
Government Spending Chart /Federal Deficit(\$ billion nominal) Fiscal Years 2000-14 a			
2000	-236.24	2008	458.55
2001	-128.23	2009	1412.69
2002	157.75	2010	1294.37
2003	377.59	2011	1299.59
2004	412.73	2012	1086.96
2005	318.35	2013	679.55
2006	248.18	2014	484.60
2007	160.71		

Legend:

a - actual reports

Source: USgovernmentspending.com, Federal Deficit FY 2000-2014, retrieved 3/8/15

Graph 2. 1. 2 US Public Debt 2000-2014



Source: US governmentspending.com, Public Debt FY 2000-2014, retrieved 3/8/15

Table 2. 1.2 US Public Debt 2000-2014

Date	Dollar value	Date	Dollar value
09/30/2014	17,824,071,380,733.82	09/30/2006	8,506,973,899,215.23
09/30/2013	16,738,183,526,697.32	09/30/2005	7,932,709,661,723.50
09/30/2012	16,066,241,407,385.89	09/30/2004	7,379,052,696,330.32
09/30/2011	14,790,340,328,557.15	09/30/2003	6,783,231,062,743.62
09/30/2010	13,561,623,030,891.79	09/30/2002	6,228,235,965,597.16
09/30/2009	11,909,829,003,511.75	09/30/2001	5,807,463,412,200.06
09/30/2008	10,024,724,896,912.49	09/30/2000	5,674,178,209,886.86
9/30/2007	9,007,653,372,262.48		

Source: USgovernmentspending.com, Public Debt FY 2000-2014, retrieved 3/8/15

Question 2. Analyze the relationship between the Federal budget deficit and the national debt.

According to Miller, (2014, p.301) Government budget deficit shows an excess of government spending over government revenues during a given period of time. Government budget surplus shows an excess of government revenues over government spending during a given period of time. Deficits have been much more common than federal budget surpluses. Public debt accrues as a result of the annual budget deficits. Any surplus budget will reduce the public debt. Gross public debt means: all federal government debt irrespective of who owns it (Miller, p.304). Net public debt means: Gross public debt minus all government interagency borrowing. Data in question one pertains to gross public debt only. Adding state and local annual budget deficits with that of the federal government will raise the national budget deficit and hence public debt.

Question 3. How does a Federal budget deficit come into existence? When there is a budget deficit, how does the administration deal with it?

Government budget deficit shows an excess of government spending over government revenues during a given period of time as mentioned in answer to question 2. Excess annual spending over revenues (budget deficit) could be financed either by raising taxes or by borrowing through selling government bonds. Since the former is not very popular with taxpayers, the latter is the norm to finance the budget deficit. Parkin, (2014, p.739) explains how the government can deal with budget deficit as follows: "Raise income taxes; raise social security taxes; cut social security benefits; and cut federal government discretionary spending".

Question 4. When dealing with the budget deficit, tell why the administration should be concerned with "crowding out."

Crowding out effect is the tendency of expansionary fiscal policy to cause a decrease in planned investment or planned consumption in the private sector. This decrease normally results from the rise in the interest rates (Miller, p.283). In a closed economy (absence of the foreign sector), additional borrowing by the government from the

public to finance the budget deficit will raise the interest rates (i). Suppliers of loanable funds are enticed to buy more government bonds as its price drop when interest rates rise. As a result of the rise in interest rates, investment expenditure will fall leading to slower growth of productivity and living standards. The government is concerned about these bad effects on the economy emanating from the financing of the deficit budget through sale of government bonds to the public. When the government borrows from the private sector, crowding out effect could be partial or complete. Miller (2014) elaborates on the Ricardian Equivalence theory as follows: “in the long run, higher government budget deficits have no effect on the equilibrium RGDP per year. Ultimately, therefore, government spending in excess of government receipts simply redistributes a larger share of RGDP per year to government provided goods and services” (p.310).

Question 5. What happens to interest rates, private investment, and consumption if “crowding out” occurs? Describe how “crowding out” affects other sectors of society, e.g., the business sector, the consumer sector, the banking sector, the international sector.

As mentioned in Question 4, “Crowding out effect is the tendency of expansionary fiscal policy to cause a decrease in planned investment or planned consumption in the private sector. This decrease normally results from the rise in the interest rates” (Miller, p.283). When crowding out occurs, interest rates go up, private investment declines in response to higher interest rates, followed by decline in consumption as a result of lower employment caused by a fall in private investment. Sector specific effects of crowding out are as follows:

Business sector: Private sector investment declines as r is less than the interest rate on borrowing investment funds ($r < i$). Business sector stagnates as a result of the decline in consumer expenditure on durable goods. It leads to decline in factory orders for goods with surplus labor and build-up of inventories, Thus business sector stagnates when interest rate goes up due to crowding out effects of the deficit financing by the government.

Consumer sector: Those who can afford will tighten their belts to save more and invest more in government bonds, as bond prices decline. But majority of households will postpone purchase of durable goods that need long term financing because of the higher interest rate. Consumer expenditure on goods and services will decline as they are more expensive than before, because cost of production goes up due to higher interest rate on borrowing.

Banking sector: Saving deposits increase if the interest rate on saving deposits exceeds the interest rate on government bonds. Depending on the r in relation to i on the proposed investment projects, borrowers in the private sector will scale down their borrowing from banks. As a result, banks find it hard to breakeven.

International sector: There will be inflow of foreign capital, as foreigners buy more US bonds at higher interest rates. US Dollar appreciates. US exports decline as foreign buyers of US goods lack extra US dollar funds because they have invested it in the US bonds. Another reason for the decline in exports is due to the fact that US goods are more expensive to import as a result of the strong dollar. Less employment in US discourage more imports despite the strong dollar. Higher the budget deficit, higher is the international trade deficit. In other words, value of exports (X) $<$ value of imports (M). But higher interest rate ensuing from higher budget deficit will entice more inflow of foreign capital as mentioned above; hence trade deficit in the current account is paid for by the surplus in the capital account on the nation's Balance of Payments.

Macro economy: Increase in government activities has resulted in an equivalent decrease in private sector economic activity and the deficit financing has not resulted in an improvement in the GDP and hence in employment, income and standard of living, in the case of complete "crowding out".

Question 6. What motives could the administration and Congress have to increase or to decrease the budget deficit? What impact would each of these have on the elements of society listed in question 5?

If the administration and the congress are fully convinced that the proposed deficit financing will fund projects where $r > i$, they have a motive to increase the deficit. They should be inclined to decrease the budget deficit if the opposite result where $r < i$ is expected. This decision making involves value-judgment across time horizon using shadow pricing. Sometimes it is impossible to forecast the real weight to be assigned to a particular project at present to be funded through deficit financing. So the guiding principle as a norm to be followed is the expected rate of return from the proposed projects and to make sure that the $r > i$. Yet it is important to realize that accurate CBA could not be undertaken at present in some projects like the "Moonshots for the 21st century" by Fareed Zakaria (CNN.Com, March15, 2015 GPS), as there is a long time gap between the project cost incurred in the current period and the

period of accruing benefit. Some of such projects, especially on investment in R&D, are really capable of reaping bounty of future benefits that far outweigh the current cost.

There are two perceivable scenarios: proposed projects where $r > i$ and proposed projects where $r < i$.

Scenario 1 where all projects are good for the economy, if financed today through borrowing because $r > i$. In that case, the following table gives the picture of an upbeat economy.

Table.2.6.1 Scenario 1 An upbeat economy where $r > i$ for projects with deficit financing

Business sector	Consumer sector	Banking sector	International sector	Macro economy
Prosper. Private sector investment soars as Consumer demand expands. Business inventory depletes, Factory orders expand, employment rise, and investment increases further.	Prosper.Increases income which in turn increases consumption expenditure that stimulates the economy through multiplier effect of higher marginal propensity to consume.	Prosper. With a robust business sector, More transactions and saving deposits are created. Banks give more loans for investment as well as for consumption as the economy grows.	Prosper. Higher income level and strong dollar increase imports that increase the foreign income that helps in turn to increase US exports. A buoyant foreign sector exist with high exports and high imports, in addition to the inflow of foreign investment in US treasuries.	Prosper. GDP grows and standard of living increases due to higher income and higher private sector investment, in addition to government investment.

Table 2.6.2 Scenario 2 An economy in distress where $r < i$ for projects with deficit financing (as given in question 4 in section 2 of this paper)

Business sector	Consumer sector	Banking sector	International sector
<p>Private sector investment decline as r is less than the interest rate on borrowing investment funds ($r < i$).</p> <p>Business sector stagnates as a result of the decline in consumer expenditure on durable goods. It leads to decline in factory orders for goods resulting in firing of excess workers and buildup of inventories.</p> <p>Thus business sector stagnates when interest rate goes up due to crowding out effects of the deficit financing by the government.</p>	<p>Those who can afford will tighten their belts to save more and invest more in government bonds. But majority of households tend to postpone purchase of durable goods that need long term financing because of the higher interest rate.</p> <p>Consumer expenditure on goods and services will decline as they are more expensive than before, because of higher cost of production to the producers due higher interest rate on borrowing.</p>	<p>Saving deposits increase if the interest rate on saving deposits exceeds the interest rate on government bonds. But borrowing falls at higher interest rates and banks can hardly break even and hence seeds of declining economic activity are sown.</p> <p>Depending on the r in relation to i on the proposed investment projects, borrowers in the private sector will scale down their borrowing from banks. As a result, banks find it hard to breakeven in their business activities</p>	<p>Inflow of foreign capital goes up as foreigners buy more US bonds because they get a higher yield in the form of higher interest rate.</p> <p>US exports decline as foreign buyers of US goods lack extra US dollar funds because they have invested it in the US bonds. Also, US goods are more expensive to foreign buyers due the strong dollar. Trade deficit widens ($M > X$). Less employment in US discourage more imports despite the strong dollar.</p>

In scenario 1, the burden of public debt is no more an important issue because the borrowed funds have resulted in benefits far exceeding the initial costs of deficit financing; and in scenario 2, the opposite result lands the economy in peril of raising enough funds to repay the debt with the interest in addition to the negative consequences of “crowding out” on the health of the economy.

Question 7. How could the administration and Congress go about changing the size of the deficit? What impact would any change have on the current state of the economy (the size of the recessionary gap or the inflationary gap, whichever exists)?

One of the two ways to change the size of the deficit is to raise marginal tax rate (MTR) on everyone, especially on the rich. The flip side of this measure is the unpopularity of paying more tax among the taxpayers which poses to be a prescription for the failure of the policy. In addition, the limited number of rich will devise measures to evade the tax including a reduction of economic activity that earn eligibility to pay higher tax. Miller, (p.287) describes the whole scenario as follows: “Laffer Curve indicates that tax revenues initially rise with a higher tax rate. Eventually, however, tax revenues decline as the tax rate increases”. As the interaction between the conflicting effects (reduction in work effort and reduction in disposable income) springing forth from a higher tax rate will adversely affect the tax revenue, supply side economists advocate for a reduction in MTR to induce workers to work more and earn more to pay more taxes. If faced with a recessionary gap (RG) a situation in which the actual RGDP < the potential RGDP, any prospect to raise tax rate on everyone is out of question because income is already low due to underutilization of the existing resources, especially labor in the economy. In that case, an increase in the MTR on the rich who have got the potential to create jobs in the economy will thwart the effort by the administration to help recover the economy from RG to full employment (FE) equilibrium. The economy will languish in RG for a considerable period of time. In the presence of a short run RG, deficit spending by the government can increase both employment and RGDP. On the other hand, if the economy is suffering from an inflationary gap (IG a situation in which the actual RGDP < the potential RGDP), higher taxes will serve as a panacea to reduce the aggregate demand (AD) to reign the economy back to FE equilibrium. Still, the golden rule is that overzealous policy makers should not strive to kill the goose that lay the golden egg. In a nutshell, incentive to work more and harder to earn more, save more and invest more and adding ability to pay more taxes, should never be stifled with. In an extreme case, Miller, (p.312) cites a

rare possibility to impose a one-time tax to pay off all the net public debt. In that impossible scenario, one could imagine that tax amount could exceed the RGDP in 2015. When the economy is at full employment, government deficit spending will end up in an IG where actual RGDP > potential RGDP and the rate of unemployment will be less than the natural rate of unemployment in the short term before long run equilibrium is regained.

Second way to change the size of the deficit is to reduce outlay on entitlements (necessary federal expenditures), defined as guaranteed benefits under government programs such as Social Security, Medicare and Medicaid (Miller, p. 312) which are non-controllable expenditures or non-discretionary expenditures, which exceed all other domestic spending in the economy. It is believed that reduction of these expenditures is an impossibility by its very nondiscretionary nature that compels one to conclude that 'containing federal budget deficits is likely to prove a difficult task' (op.cit, p. 313).

Question 8. What percent of the funds borrowed in the Federal debt is owed to foreigners, to U. S. individuals and firms, and to U. S. government agencies?

Percent of the funds borrowed in the Federal debt \$ 17,824,071,380,733.82 as on (09/30/14) owed to: US individuals and firms (US Public) = \$12,784,971,238,978.02 =71.73% and US government agencies (inter government holdings) = \$ 5,039,100,141,755.80 =28.27% (Source: <http://www.treasurydirect.gov>, Daily History of debt results, retrieved 3/12/2015)

Information gathered from the www.crs.gov RS22331, Table.1 gives the following picture of foreign holdings as a share of publicly held debt.

If the findings for December 2014 are correct, there is a decline in the share of US public debt held by foreign entities. USFactcheck.org also confirms this for December 2013. The fact of the matter is that as the foreign liability of public debt declines, the burden on future generations to transfer funds from US to foreign countries will recede. On the other hand, public debt holdings within the US will rise and that may be attributable to many factors including the low interest rate on bonds that discourage foreign buyers of US bonds.

Data from USFactcheck.org for March 2013 gives us the following chart.

Graph 2. 8.1 Ownership of Federal Debt



Table 2. 8.1 Estimated ownership of US Treasury Securities (in Billions of US Dollars)

End of Month	Foreign holdings as a share of publicly held debt. (Per cent)
Dec. 2013	47.1
Dec. 2012	48.2
Dec. 2011	48.0
Dec. 2010	47.6
Dec. 2009	47.2
Dec. 2008	51.3

Source: www.crs.gov, RS22331, Table.1, retrieved 3/14/15

Question 9. When the national debt instruments mature, how are the debt holders paid off? Where do these funds come from?

There are several methods to pay the debt holders when their claims against public debt get mature. According to <http://www.economicconcepts.com/index.htm>, some of those methods are given below.

(i) Sinking Funds:

Sinking Fund is very important method for the redemption of public debt. It is a fund which is created out of the general revenue for paying off the loans every year. The debtor country during the life of debt sets apart a portion of the current revenue every year. When the sum thus accumulated becomes equal to the loan raised, it pays off the entire debt in one installment.

(ii) Terminable Annuities:

If a debtor country wishes to repay a permanent debt, it may do so by fixing installments over a period of years. These installment repayments are known as *annuities*.

(iii) Utilization of Surplus Budget:

If during a particular year, the country has surplus budget, it can be utilized in reducing the burden of the debt. It is true that surpluses can be used for redeeming the public debt, but favorable budgets are not common with the debtor countries. If at all there is any surplus any year, it is generally so small. It cannot make any significant reduction in the national debt.

(iv) Redemption by the Purchase of Government Stock:

A Government can also lessen the burden of debt by the purchase of its own stocks in the market. These stocks can be brought by fresh borrowing at low rates or by the utilization of surplus revenues.

(v) Capital Levy:

Another important method which has been suggested by economists for wiping off the public debt is the institution of a special debt redemption levy as is generally called. The advocates of capital levy state that it is not possible to reduce the burden of war debt by means of a sinking fund or surplus revenues or by annuities, etc. The state should levy a special tax on accumulated wealth or capital of the people at a progressive rate and with the money thus raised pay off all the war debts.

(vi) Surplus Balance of Payments:

A government can pay off debt by increasing exports and reducing imports. The surplus balance can be used to lessen the burden of debt.

(vii) Writing off loans:

The government can also request the credited countries to write off loans.

Additional methods are available from www.yourarticlelibrary.com that deal with Redemption of public debt which is a way of escape from the burden of public debt. Redemption means repayment of a loan. Here we refer to two of those methods:

(viii). Refunding:

Refunding of debt implies the issue of new bonds and securities by the government in order to repay the matured loans. This means that when the claim on the treasury security matures, a new one is issued in order to collect funds to repay it and this method is also known as 'the rolling over the debt', mentioned in Cohick and Richards, (2012. P.100). In the refunding process, usually short-term securities are replaced by issuing long-term securities. Under this method the money burden of public debt is not relinquished but it is accumulated owing to the postponement of debt redemption.

(ix). Additional Taxation:

The simplest measure of debt redemption is to impose new taxes and get the required revenue to repay the loan principal as well as the interest. This possibility is already mentioned in the answer to question 7 in this paper.

Question 10. Is the size of the national debt a problem? If so, describe the problem. Are the interest payments on the national debt a problem? If so, describe the problem

Miller, (2014, p.306) describes two such problems: first, possible burden on the future generations and second, possible transfers from US residents to residents in foreign countries. Let us deal with the first problem now. Funds equivalent to the budget deficit, if raised through the sale of treasury securities, will raise the current level of consumption that reduces savings. In the long run reduced saving limits the growth potential in the economy and

deficit financing redistributes a large share of RGDP per annum to government provided goods and services (G&S) which are to be paid by the future generation as the present generation is not capable of chipping in to defray the cost. The size of the public debt matters in the sense that the bigger the size of the debt, the higher the interest to be paid at a future date. Higher interest rate dampens growth of capital formation with a detrimental effect on growth of productivity and improvement in society's living standard. Hence future generation is left with little prospects for wealth accumulation after paying higher taxes on debt inflicted on them by the previous generation. If we consider the generational accounting, present value (PV) and the future value (FV) of a present sum, we remain with the following formula: $FV = PV (1+i)^n$. It will be really interesting to substitute values from the debt figures into the variables such as interest rate (i), present amount of the debt (PV) and the number of years (n) in the above formula in order to get just a glimpse into the enormity of the burden on the future generations.

The second problem is about the transfer of income from US to foreign residents if a substantial portion of our public debt is owned by foreigners. This fear is unwarranted in the current context, as the 2014 data shows that only 34 % of the public debt is owned by foreign residents (as noted in the answer to question 8 of this paper). At the 2015 near zero low US interest rate, servicing the public debt is not going to be a big burden. Whatever be the nature of the anticipated problems arising from creeping public debt, a firewall around government budget (ensuring that $r > i$ in all projects funded by deficit finance) will help ward off detrimental effects of deficit finance on the economy.

Conclusion

Given the fact that US total public debt outstanding as 17,824,071,380,733.82 in December 2014 (source: <http://www.treasurydirect.org>), and US population as 322.6 million (source: <http://www.UNFPA.org>, State of the World Population), we observe that the per capita debt in 2014 (17,824 Trillion/322.6Million) stood as high as \$ 55,251.085. According to www.tradingeconomics.com, US RGDP per capita in 2014 was \$45,863.02. Hence, an alarming figure is derived as US per capita debt (\$ 55,251.085) > Per capita RGDP (\$45,863.02) in 2014. One wonders if it is not yet time to get up from a deep slumber and get down to real business of reversing this trend and start the solid business of economic growth in USA.

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