



Issues in Economic Policy

The Effect of Budget Deficits On Long-Term Interest Rates

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Volume 1, Number 1
Spring 2003

ABSTRACT

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There is an ongoing debate within academic circles, and, especially as of late, public policymakers regarding the economic effects of persistent budget deficits. Macroeconomic theory suggests that if a budget deficit is not completely offset by a rise in private savings, private domestic investment or net foreign investment must decrease. A result of such an adjustment may be an increase in interest rates, which would reduce future national income and stifle investment. Although some papers have not found such a salient correlation between these variables, it is highly unlikely that significant deficits have negligible implications, as some suggest. This paper contains simple macroeconomic identities, suggesting the theoretical effect of deficits on certain variables. Further, a macro-econometric model is used to examine changes in the budget deficit and the effect on long-term interest rates, employing expected deficit data from the Council of Economic Advisers and the Congressional Budget Office. Our results suggest that the budget deficits of the next several years, in large part due to President Bush's Economic Growth and Tax Relief Reconciliation Act, will have an adverse effect on interest rates. Thus, it would be generally beneficial in terms of national income, among other things, to become more fiscally austere.

I. Introduction

The effect of budget deficits on interest rates is not a topic that has been given only a cursory glance in the field of economics—in truth, it is one that has been attacked numerous times from many different angles. Yet, amidst these thorough and oftentimes extremely intricate studies done by prominent economists, an agreeable conclusion has yet to be reached. Some say they fail to see the correlation between the two variables, while others argue the relationship becomes strikingly apparent once the data are correctly analyzed. Knowing the true nature of the relationship between interest rates and budget deficits, even if there is actually no significant relationship at all, would be of particular importance given our current economic conditions and also anticipated future events.

The Congressional Budget Office, whose purpose is to provide unbiased budget information to Congress to be used for fiscal decisions, predicts that after a deficit in 2002 of 158 billion dollars, the US will continue to experience deficits for the next several years (CBO, 1). These numbers are not particularly shocking, given that we are only beginning to climb out of a trough in the business cycle in which deficits are more likely due to lower tax revenues and higher transfer payments (i.e. unemployment compensation, etc.), the automatic stabilizers of the economy. The Fairmodel, a macro-econometric model developed by Ray Fair of Yale University that is used to make predictions in this paper, estimates the future budget deficits to be markedly higher than those of the CBO. Regardless, current economic conditions are only partly responsible for the predicted deficits in the next several years. The CBO avers the significance of President Bush's Economic Growth and Tax Reconciliation Act on the budgetary outlook

of the next several years, along with the Job Creation and Worker Assistance Act of 2002 (CBO, 1). Tax cuts and increased government spending obviously increase the deficit, and without these plans the deficit would be smaller. But how would economic conditions in the near future be affected if the U.S. were to forego these stimulative policies? The unemployment rate as of February 2003 is 5.8%; thus, any action that would decrease aggregate demand, such as a decrease in spending or increase in taxes, would undoubtedly face harsh criticism.

Still, the efficacy of President Bush's stimulus has come under fire. Some argue that the tax breaks will go mainly to those in the higher income tiers, who oftentimes save most of this additional income instead of using it towards consumption—hence, their marginal propensity to consume is lower. Moreover, these tax breaks also decrease national saving, which is used to finance domestic and net foreign investment. A lower level of national saving is likely to contribute to a lower level of future national income and also higher interest rates, which is obviously not desirable. Also, the budget projections from the CBO do not take into account the expenditures needed to finance a war on Iraq, which, according to a recent CBO report, could cost roughly 10 billion dollars per month (CBO, 1). The fiscal situation of the future may be even grimmer than it appears.

In sum, the issue essentially reduces down to the question of what will be more beneficial for our economy in the long-term: tax breaks to provide an economic stimulus now, or a more austere fiscal policy to keep interest rates down and future national income up. The goal of this paper is to thoroughly examine both sides and come to a

conclusion, even though the issue may be so complex that we are unable to ascertain what actions, if any, are right and wrong.

I. Basic Macroeconomic Relationships

It is undoubtedly useful to start this paper with a basic overview of the theory behind the government budget, since it displays what are the expected implications of surpluses and deficits. Starting with the assumption that “private saving plus next tax revenue must by definition equal the sum of private domestic investment, government spending on goods and services, and net exports” (Gordon, 36), we have the leakages-injections identity.

$$S + T = I + G + NX \quad (1)$$

In this equation S represents private saving, T represents tax revenue, I represents private investment, G represents government spending, and NX stands for net foreign investment. By rewriting equation 1, we obtain another equation that represents the government budget.

$$T - G = I + NX - S \quad (2)$$

A shift to a budget deficit, which is predicted to occur over the next several years, implies that the left-hand side of the equation will decrease in magnitude, by means of a lower T or greater G. Since this equation holds by definition, the right-hand side must also adjust,

implying that some combination of a decrease in private domestic investment, a decrease in net foreign investment, and an increase in private saving must occur.

What does occur to the variables on the right-hand side of the equation is critical to the debate. If a decrease in public saving, which is another term for the budget, is completely offset by an increase in private saving, national saving (the sum of public and private saving) remains unchanged. Since national saving is used to fund private domestic investment and net foreign investment, these would not fall, and thus future national income, which is dependent upon investment today, would not be affected. The question remains: By how much does private saving increase when public saving decreases? The Barro-Ricardo Equivalence theorem suggests that the additional income people receive due to tax cuts will be saved rather than consumed, as they will forecast higher tax rates in the future. Yet, the empirical results tell a different story, as the personal saving decreased after the 1981-1983 tax cuts (Gordon, 396).

According to a paper written recently by William G. Gale and Peter R. Orszag of the Brookings Institution, "CBO (1998c) concluded that private saving may offset 20 to 50 percent of such a shift. Elmendorf and Liebman (2000) argue that private saving would offset 25 percent of an increase in the deficit. Gale and Potter (2002) estimate that private saving will offset 31 percent of the decline in public saving caused by the 2001 tax cut" (Gale, 10). These estimations imply that a considerable portion of the budget deficit will not be financed by an increase in private saving, and thus it must be

accompanied by a decrease in private domestic investment and/or a decrease in net foreign investment.

Benjamin Friedman of Harvard University concludes in a paper written in 1992 that it is likely both private investment and net foreign investment will decrease (Friedman, 302). This fall in private domestic investment is analogous to the familiar theory of “crowding-out”, in which a tax reduction or increase in government spending reduces investment spending due to a higher interest rate. Friedman claims that during the Reagan years of persistent deficits, “all three major categories (investment in business plant and equipment, in housing, and in business inventories) declined” (Friedman, 302). Moreover, he concludes that real interest rates also rose during this period, citing a high real commercial paper rate in the 1980s in comparison to previous decades. It should be noted, though, that Friedman is not necessarily inferring a causal relationship, but is merely suggesting the potential relationship between deficits and interest rates.

Gale and Orszag state that after a decline in national saving either an increase in interest rates or an increase in capital inflows must occur to offset the deficit. Regarding the former, a lower level of national saving “puts upward pressure on interest rates as firms compete for the limited pool of funds to finance their investment projects. The increase in interest rates then serves to reduce domestic and net foreign investment and bring national saving and investment back into equality” (Gale, 7). This notion is also equivalent to the theory of crowding-out.

According to these simple identities, it doesn't matter how a deficit is financed—be it a decrease in private domestic investment or decrease in net foreign investment—since both lead to lower future national income. Yet, these identities fail to account for the future beneficial effects on national income of government investment. Indeed, investments by the government in human capital, infrastructure, etc. are likely to raise the standard of living and, hence, national income, in the future. Still, if a war with Iraq occurs, that would mean a significant amount of government spending would be on essentially consumption goods (i.e. ammunition, etc.), which would not contribute to future national income. (CBO, 1). The Congressional Budget Office estimates that “prosecuting a war (with Iraq) could cost between \$6 billion and \$9 billion per month”(CBO, 1), while the cost of rebuilding the country, which seems to currently be our intentions, is not surprisingly inestimable. This increase in government spending would undoubtedly exacerbate the fiscal situation, and thus further delay the realization of a balanced budget.

III. Macroeconomic Assessment

As aforementioned, this issue reduces down to the comparison of the benefits of a more balanced budget and a current fiscal stimulus. With regard to the current stimulus, Bush's proposal contains, among other things, a reduction in marginal income tax rates, elimination of corporate double taxation, an increase in the amount of tax deductions for a small business, and a provision of several billion dollars for unemployment accounts. According to a paper released by the Council of Economic Advisers on February 8, 2003, the implementation of these proposals would cause real GDP to grow 1% faster in 2003,

and, on average, .2 percent faster during the span of 2003-2007. Also, the CEA estimates that the deficit will increase in total by \$359 billion in the years 2003-2007 with no impact of faster growth, or by \$166 billion including the impact of growth (CEA, 1). Thus, the CEA basically concludes that real GDP will grow significantly faster in the next year or two, but, on average, only moderately over the next several years.

In addition, other economists have speculated that President Bush's plan will have an even less robust effect. Gale and Orszag cite some of these critics in their study, writing, "Gale and Potter (2002) estimate that the tax cut will have little or no net effect on GDP over the next 10 years and could even reduce it" (Gale,10), while "Auerbach (2002) estimates that the 2001 tax cut will reduce the long-term size of the economy unless it is financed entirely by spending reductions"(Gale,10). The rational expectations hypothesis could also possibly explain for the relatively small effect of the tax cuts, since a reduction in taxes would be anticipated and would thus minimally affect consumption. Observations such as these clearly bring into question the potential benefits of the proposal, and, indeed, its efficacy in general.

To assess the macroeconomic effect of a reduction in future budget deficits, macro-econometric models can be used. Gale and Orszag test 12 different models in their study, including the Fairmodel, and come to the conclusion that "an increase in the budget deficit of 1 percent of GDP would raise long-term interest rates by about 50 basis points after one year and about 100 basis points after 10 years" (Gale, 27). Moreover, Gale and Orszag show that scholarly papers incorporating expected future or unanticipated current

deficits into their analysis regarding interest rates and the budget do indeed find a significant positive correlation between the two (Gale, 22). Thus, in short, there is some unanimity shown by both macro-econometric models and economic literature regarding the effect of budget deficits on interest rates.

IV. Analysis with the Fairmodel

The Fairmodel, developed by Ray Fair of Yale University, contains 30 equations and 101 identities. Thus, this model of the economy contains a substantial number of variables in which alterations to them will cause some change in the fiscal outlook. For the purpose of our study, we look at a decrease in the amount of transfer payments. This choice should be fairly unambiguous, since the President's proposal does contain an allocation of \$3.6 billion to Personal Reemployment Accounts. In this evaluation, though, transfer payments decrease by a significantly greater amount, for the purpose of simplifying our examination. Further, Gale and Orszag evaluate the effect on interest rates solely through this channel, analyzing the results of an increase in the budget deficit by 1% of real GDP due to a higher level of transfer payments.

In this simulation the projected government budget deficit is decreased by \$100 billion (a rough estimate of 1% of real GDP) per year over the time period 2003-2006. Since the government deficit is an endogenous variable in the Fairmodel—that is, it is solved by the model, our selection of specific deficits over this period causes this variable to become exogenous. Due to the setup of the model, if an endogenous variable is made exogenous, another variable that is currently exogenous must be endogenized. Thus, similar to Gale and Orszag, that variable in this study is transfer payments. Further, the

model allows for different monetary policy responses by the central bank. In this simulation, action of the central bank is based upon an interest-rate reaction function, which has the unemployment rate, the price level, and some lagged interest rates, among other things, as its explanatory variables.

V. Results

Overall, the results obtained from this simulation match up remarkably well with the macroeconomic theory (refer to end of paper for full results). The mortgage rate, which in this analysis serves the purpose of the long-term interest rate, is roughly 15 basis points lower after the first prediction year, and approximately 30 basis points lower at the end of the prediction period. The 3-month Treasury Bill experiences a similar decline in comparison to the unaltered prediction path. With regard to Gross Domestic Product and unemployment, these variables react as expected to a decrease in government transfer payments. GDP falls by roughly 50 billion per year, while the unemployment rate is about .15% percent higher. Although these results are undesirable, they exemplify a portion of the trade-off between larger and smaller budget deficits.

One variable of critical importance, non-residential fixed investment, exhibited unexpected behavior in response to the decrease in the budget deficit. According to the basic tenets of macroeconomic theory, a decrease in the interest rate causes investment to increase, since the real rate of return is now higher on investment projects. Yet, non-residential fixed investment surprisingly declines throughout the prediction period in the simulation. When examining the equation the model uses for investment, though, such a

result does not seem so surprising. Fair uses an equation for investment that contains several lagged real GDP variables, among other things, but, almost shockingly, it does not have any interest rate as an explanatory variable (Fair, 133). Thus, a prediction by the model of a decline in investment is basically expected, since such weight is given to values of real output, which is declining. In sum, the results for investment spending can be thrown out, since they are not dependent in any way on the interest rate and thus cannot be deemed accurate.

In addition to the aforementioned variables, several others were analyzed due to their relative economic significance. Since these variables did not respond in an uncharacteristic manner to the decrease in the deficit, further discussion of these is unnecessary.

VI. Conclusion

In sum, the results obtained from the Fairmodel simulation support the relationships between these economic variables that general macroeconomic theory suggests. A decrease in the budget deficit by 1% of GDP per year, which is essentially the equivalent of disregarding Bush's growth and tax relief package (CEA, 2003), does indeed lower both short-term and long-term interest rates. Further, it is likely that if the macroeconomic model's prediction period extended further out into the future, the long-term interest rate would have decreased in even larger increments. Robert E. Hall of MIT wrote in a 1977 paper on investment and interest rates that long-term rates respond with a serious lag. Further, he concludes that capital formation also does not respond

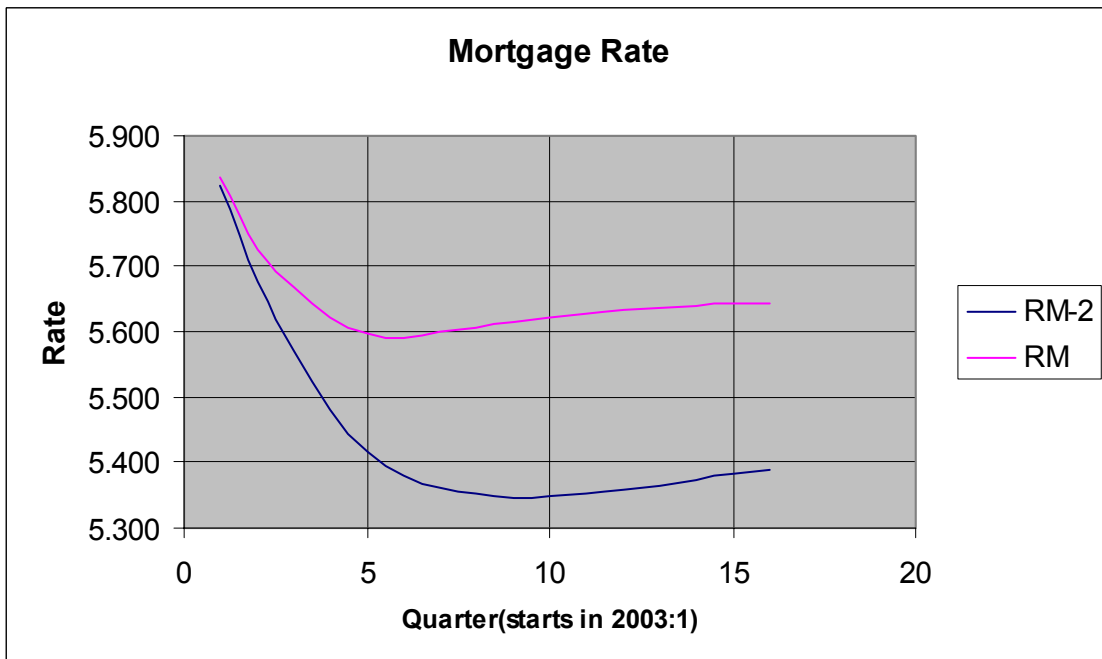
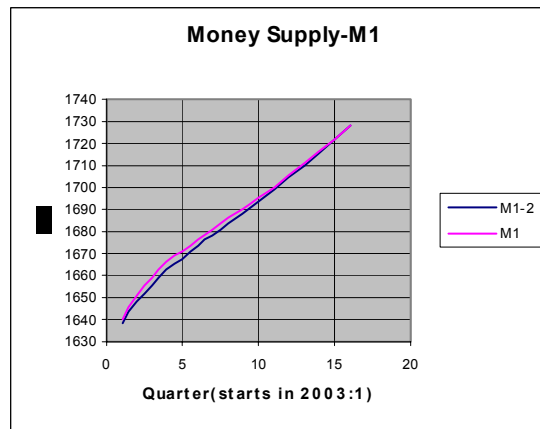
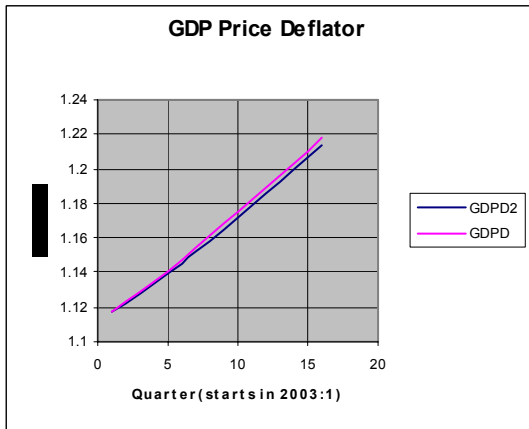
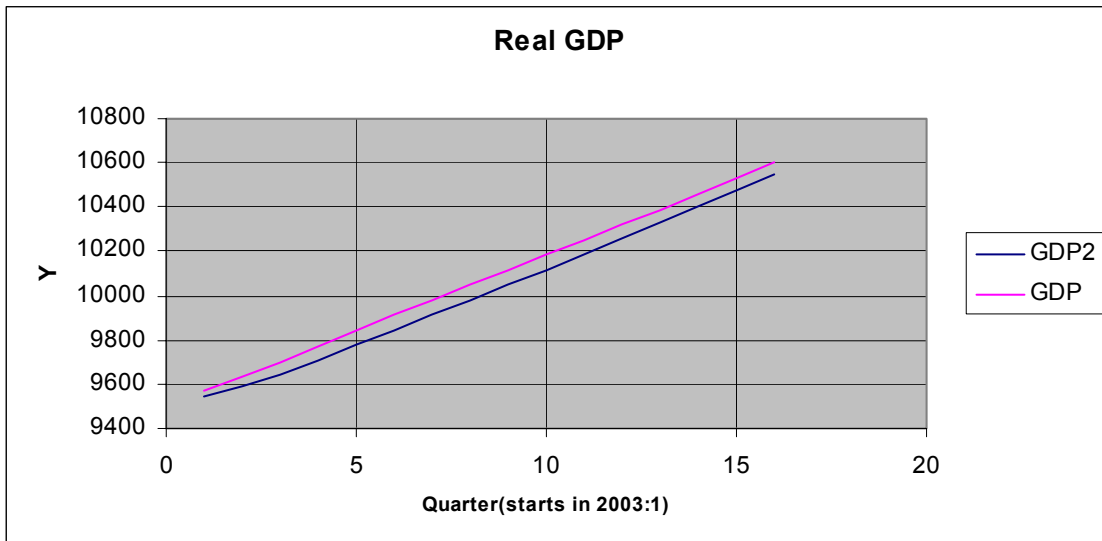
immediately due to the putty-clay hypothesis and the time involved in implementing new capital (Hall, 62).

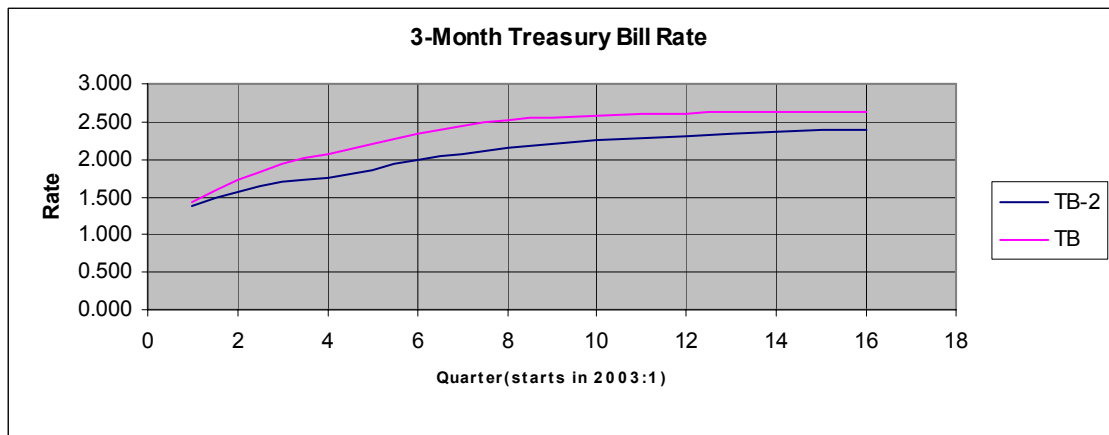
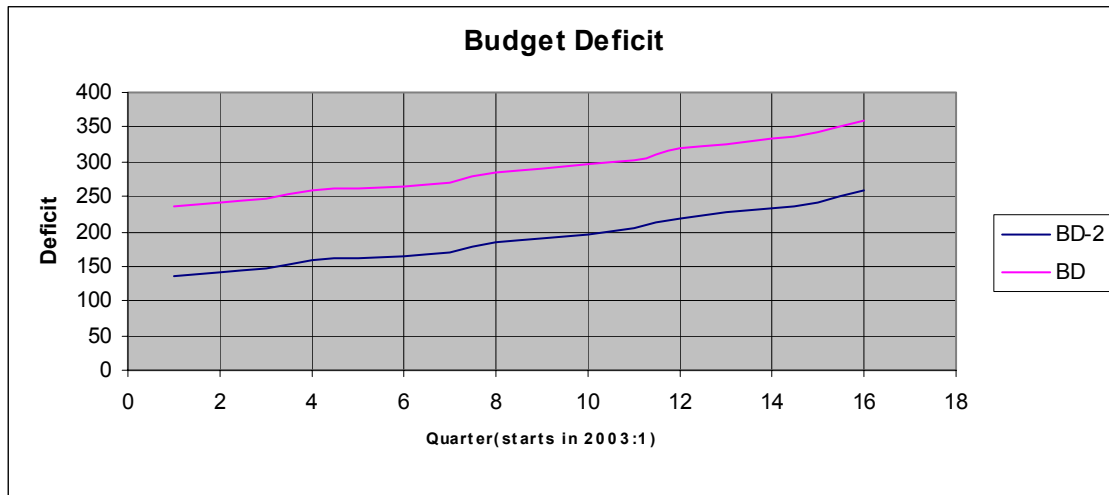
As mentioned earlier, this issue is truly about what will be more beneficial for our economy: a more balanced budget accompanied by lower interest rates and lower GDP, or a current fiscal stimulus that will keep the interest rate higher along with national income. In a recent report by the Council of Economic Advisers, they state “a stronger recovery depends on a robust rebound in business investment. This is the key factor to creating more jobs—when companies build new factories, they hire workers and boost employment in capital-goods industries” (CEA, 2003). Thus, it is highly likely that a lower interest rate that stimulates investment is more favorable, given the current economic conditions. A decrease in the budget deficit can engender this result, and, although it may immediately result in an increase in unemployment, the additions made to the capital stock will create more jobs in the future.

In short, we recommend that the economic growth and tax relief plan of President Bush should not go into action, or at least should be lessened in magnitude. This plan will undoubtedly stimulate aggregate demand to a certain degree in the near future, but it may lead to higher interest rates, lower investment, and hence, lower future national income. As of April 27th, 2003, the tax cut component of this expansionary plan has already been reduced from \$550 billion to \$350 billion, indicating an increasing amount of skepticism regarding the efficacy of the plan’s economic stimulus. Perhaps a minimized version of Bush’s plan will provide a bit of current fiscal stimulus to help our

currently sluggish economy while not significantly limiting prospects for future economic growth. We see such policy action as clearly a move in the right direction, while also maintaining the view that our economy might be even better off in terms of future national income if no expansionary fiscal policy was pursued at this time.

2 Denotes Change in Deficit





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