Large Deficits Produce High Interest Rates

Cebula, Richard and Schwartzburt, Mark and Scott, Gerald

Jacksonville University, Florida Atlantic Universiy, Florida Atlantic University

21 June 1990

LARGE DEFICITS PRODUCE HIGH INTEREST RATES

By Richard J. Cebula , Mark Schwartzburt, and Gerald Scott

Evans (1985, p. 85) has argued that one "…paradigm in economics implies that large deficits produce high interest rates." However, Evans himself presents as empirical analysis of four different time periods and concludes (p. 85) that this "…paradigm is not supported by the facts." Indeed, Evans (1985, p. 85) goes so far as to assert that "…in over a century of U.S. history, large deficits have never been associated with high interest rates." This brief note challenges the basic conclusion of Evans' analysis by providing strong empirical evidence that federal budget deficits have in fact had a positive and significant impact on the ex post real interest rate in the United States.

I. Model

Our analysis empirically examine the impact of the federal budget deficit on the ex post real rate of interest (EPR). Following Evans (1985), our analysis is couched within the IS-LM framework. According to the IS-LM paradigm, the real interest rate (EPR) principally depends upon real government purchases of goods and services (GP), the exogenous real money stock (MS) as determined by Fed policy, the real budget deficit (D), and real net exports (X):

$$EPR = f(GP, MS, D, X) \quad (1)$$

Where it is expected that:

$$f_{GP} > 0, \quad f_{MS} < 0, \quad f_{D} > 0, \quad f_{X} > 0 \quad (2)$$

Our model differs from that in Evans in several ways. To begin with, our variable GP excludes all transfer payments, whereas Evans' variable G includes all transfer payments and therefore is endogenous to a significant degree. Next, Evans' variable M/P is merely the real money stock, whereas the variable MS in our study is the real monetary base, which attempts to measure the exogenous dimension of the real money stock. Ext, our model includes the real balance of trade, which Evans curiously enough chooses to ignore entirely. In addition, our model uses quarterly data, whereas Evans' model uses either monthly data or annual data. Furthermore, unlike Evans, we allow for endogeneity of the real budget deficit by adopting the one-quarter lag of the seasonally adjusted unemployment rate of the civilian labor force (U_{t-1}) as the instrumental variable.

Based upon equations (1) and (2), we estimate the following quasi-reduced form equation:

$$EPR_t = a_0 + a_1\, GP_t/Y_t + a_2\, MS_t/Y_t + a_3\, D_t Y_t + a_4\, X_t/Y_T + u \quad (3)$$

where: EPR_t is the *ex post* real average interest rate yield in $quarter_t$ on Moody's Aaa-rated corporate bonds; a_0 is a constant; GP_t/Y_t is the ratio of the seasonally adjusted federal government purchases of goods and services in quarter *t* to the seasonally adjusted middle-expansion trend GNP in quarter *t* expressed as a percent; MS_t/Y_t is the ratio of the seasonally adjusted monetary base in quarter *t* (adjusted for changes in reserve requirements) to the seasonally middle-expansion trend GNP in quarter *t* expressed as a percent; D_t/Y_t is the ratio of the seasonally adjusted federal budget deficit (N.I.P.A.) in quarter *t* to the seasonally adjusted middle-expansion trend GNP in quarter *t*, expressed as a percent; X_t/Y_t is the ratio of the seasonally adjusted net exports in quarter *t* to the seasonally adjusted middle-expansion trend GNP in quarter *t,* expressed as a percent; and *u* is stochastic error term. EPR_1 is computed by subtracting the inflation rate of the consumer price index (P_t) from the nominal average interest rate yield on Moody's Aaa-rated corporate bonds (MO_t). The model in equation (3) parallels that in Evans by diving the variables GP_t, MS_t, D_t, and X_t by Y_t. Variables GP_t, MS_t, D_t, X_t and Y_t are all expressed in billions of current dollars.[1]

Evan's empirical analysis deals with four different time periods: the Civil War, World War I, World War II, and the period October, 1979-December 1983. The first three of these periods, while providing inordinately large deficits, are a typical in that they are periods of significant military conflict involving price controls, rationing, and other disruptions in the market mechanism. Although Evans does attempt to make allowances for such phenomena, it remains at least somewhat questionable whether we can make dependable generalizations about the effects of deficits on the basis of experiences during wartime periods. By contrast, the time period examined by our quarterly model runs from 1971 : 4 through 1985 : 4. Following Zahid (1988), we begin with 1971 : 4 because it is during this quarter that the system of fixed exchange rate (Bretton Woods) began to collapse. We end with 1985 : 4 because this is the last quarter for which our series [obtained from Holloway (1986, Table 2)] on Y_t is available. In any event, our study period covers the entire October, 1979-December 1983 period considered by Evans and several others as well.

II. Empirical Evidence

Given that variable D_t [and hence variable (D_t/Y_t)] is partly endogenous, we estimate equation (3) using an instrumental variables technique (as well as the Cochrane-Orcutt procedure, to correct for first order serial correlation), with the instrument being U_t-1. The choice of instrument is based on the fact that U_t-1 systematically explains the deficit variable, whereas U_t-1 is not correlated with the contemporaneous error terms in the system.

The estimate of equation (3) is given by:

$$EPR_t = +0.9 + 2.373\ GP_t/Y_t - 4.8\ MS_t/Y_t + 1.10\ D_tY_t + 0.625\ X_t/Y_T + u \qquad (4)$$

$$(+1.03)\ (+3.27)\quad (-3.38)\quad (+3.05)\quad (+1.62)$$

DW=1.58, *Rho*=0.18, *DF*=51

where terms in parentheses are *t*-values.

---

[1] If a_t is the value of the GNP deflator in quarter $_t$, then:
$(GP_t/a_t)/(Y_t/a_t)=GP_t/Y_t$
$(MS_t/a_t)/(Y_t/a_t)=MS_t/Y_t$
$(D_t/a_t)/(Y_t/a_t)=D_t/Y_t$
$(X_t/a_t)/(Y_t/a_t)=X_t/Y_t$
Thus, the deflator term (a_t) drops out of both the numerator and denominator of each ratio.

As shown in equations (4), all four of the estimated coefficients exhibit the expected signs. In addition, three of these coefficients are statistically significant at the one percent level. The coefficient on variable D_t/Y_t is significant at the one percent level, implying that the federal budget deficit exercises a positive and significant impact on the *ex post* real Moody's Aaa-rated corporate bond rate.

This same conclusion is reached even if we drop variable X_t/Y_T, from equation (3) and estimate the resulting equation in the precise same fashion as described above. The estimate, after deleting the net export variable, is given by:

$$EPR_t = +1.31 + 1.703\ GP_t/Y_t - 4.7\ MS_t/Y_t + 1.164\ D_tY_t \qquad \text{… (5)}$$

(+1.45) (+2.25) (-3.05) (+3.10)

DW=1.63, *Rho*= 0.15, *DF*=52

where terms in parentheses are *t*-values. As shown in equation (5), the deficit variable once again exercises a positive and significant impact upon the *ex post* real Moody's Aaa-rated corporate bond rate.[2] The model specification shown in equation (5) directly parallels that in Evans (1985).

III. Conclusion

Previously, Evans has argued that the federal budget deficit in the United States does not influence the real rate of interest. Indeed, Evans (1985, p. 85) goes so far as to claim that "…in over a century of U.S. history, large deficits have never been associated with high interest rates…". By contrast, using two quarterly models that directly parallel Evans' IS-LM framework, we find strong empirical evidence that the federal budget deficit does in fact raise the ex post real rate of interest. It would appear that Evans' conclusions are questionable.

References

Evans, Paul, "Do Large Deficits Produce High Interest Rates?", *American Economic Review*, arch 1985, 75, 68-87.

Holloway, Thomas, "The Cyclically Adjusted Federal Budget and Federal Debt: Revised and Updated Estimates", *Survey of Current Business*, March 1986, 6, 11-17.

Zahid, Khan, "Government Budget Deficits and Interest Rates: The Evidence Since 1971, Using Alternative Deficit Measures", *Southern Economic Journal*, April 1988, 54, 725-31.

[2] This same conclusion is reached even if we estimate this model first difference form.