



International Journal of Marketing and Technology

(ISSN: 2249-1058)

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Title

**FISCAL POLICY, PUBLIC DEBT, AND ECONOMIC
GROWTH**

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ABSTRACT:

This paper employs the variability of real government expenditure as a measure of fiscal policy and uses cross country regression analysis, first, to see whether fiscal policy is favorable for economic growth, and, second, to test the hypothesis that greater public debt tends to dampen the effectiveness of fiscal policy on economic growth. The results lend support to both contentions.

Public debt is becoming a real worldwide concern. Debt is no longer just a problem of poor developing countries, but is now becoming a major issue for rich, highly developed countries as well. Europe is experiencing debt crisis in a number of its countries and even the U.S. is having difficulties raising debt ceilings in U.S. Congress.

One of the potential consequences of high levels of public debt is that it may hamstring a government's ability to conduct fiscal policy. In order to sustain economic growth, a government needs to maintain adequate demand in the economy. Although private investment is critical for invention, innovation, capital accumulation, and economic progress, private investment is very fragile and erratic because it depends on the maintenance of demand in the economy. Investment depends on profits, and profits depend on sales, but sales ultimately depend on demand. To achieve economic growth, the government needs to create an environment conducive to investment. So that there will be high levels of investment and economic growth, it must assure sufficient demand.

The main purpose of the paper is to investigate whether increases in the public debt dampen the clout of fiscal policy with regard to economic growth. As this presupposes that fiscal policy matters for economic growth, the study also needs to consider this question. A unique feature of the paper is that it employs, contrary to the typical measures of fiscal policy generally employed such as government spending, taxation, and budget deficits, an index of *variation* in government spending over time as a rough measure of overall fiscal policy use by government. The simple rationale for using a variation variable as a fiscal policy measure is that, on the spending side, over time, fiscal policy consists of the changes in government spending in response to changes in the state of the economy

The paper is divided into five sections. The first section reviews some of the literature with regard to fiscal policy and its effect on the economy. The second section presents a simple two

equation model explaining, first, the proposed relationship between economic growth and the employment of fiscal policy, and, second, the effect of debt on this relationship. The third section explains the variables that are used in the empirical section to estimate the model and provides the details on their sources. The fourth section presents the empirical results for cross country growth regressions, and the fifth section wraps the paper up with a short conclusion.

I. LITERATURE REVIEW:

The literature with regard to fiscal policy and economic growth is extensive and on going. To get some flavor of the research in this area, this section provides a quick look at a few of the more recent undertakings.

Zagler develops a theoretical framework for reviewing articles on fiscal policy and economic growth and reviews articles in the area based on this framework (Zagler 2003).

Under the assumption that different kinds of government spending have a differential effect on economic growth, Nikos Benos breaks down government spending into a number of components in his analysis. Consistent with the hypothesis, he finds, using unbalanced panel data on fourteen European Union countries on annual data from 1990 through 2006 and taking into account that *both* spending and revenues matter for fiscal policy in terms of economic growth in an endogenous growth specification, that government spending on infrastructure and that government expenditure on property rights has a positive effect on economic growth, but that government outlays on human capital items such as education and health do not seem to matter (Benos 2009).

Hadiwibowo looks at the effect of fiscal policy on economic growth operating through the channel of investment (Hadiwibowo 2010). He uses vector auto regression analysis on quarterly data for the Indonesian economy, a developing economy, for the period of 1969 through 2008, and finds that fiscal policy in the form of development expenditure on items such as infrastructure has a positive effect on investment, but government current consumption expenditure and government revenues have a negative effect.

Despairing of the empirical results on the relationship between growth and fiscal policy through the use of single individual measures of fiscal policy, Fu, Taylor and Yucel employ pair-

wise combinations of fiscal indicators, such as increases in government spending financed by increases in taxes, in their research (Fu, Taylor, and Yucel 2003). Using vector autoregressive analysis on monthly data for the U.S. from 1983 through 2002 and utilizing the growth in nonfarm employment as the measures of economic growth, they conclude that, contrary to the expected effect of standard Keynesian theory, increases in government spending, regardless of how the spending is financed, lowers job growth.

Ocran looks at the effect of four fiscal policy variables, government gross fixed capital formation, tax expenditure, government consumption, and budget deficit, on economic growth (Ocran 2009). He finds, using a Vector Autoregressive model that accounts for more than one fiscal policy on quarterly data from 1990 to 2004 for South Africa that government gross fixed capital formation and tax receipts have a positive effect on economic growth, government consumption has a negative effect, and budget deficits seem to have no effect.

Senbet uses a vector autoregressive approach to assess the relative effectiveness of monetary policy compared to fiscal policy on real output (Senbet 2011). Using two alternative measures of monetary policy, the federal funds rate and borrowed reserves, and actual government expenditures as a measure of fiscal policy, he looks at quarterly data on the U.S. economy from 1959 to 2010. His results indicate that monetary policy is more potent than fiscal policy in affecting real output.

II. THE DATA:

The average annual rate of real economic growth from 2000 through 2008 in constant 2000 U.S. dollars is used as the dependent variable in the regression analysis. The World Bank provides yearly data by country on the annual percentage growth of GDP in constant 2000 U.S. dollars (World Bank 2011). Calculations were performed, based on the World Bank figures, to obtain the average annual rate of real economic growth over the ten year period from 2000 through 2008.

The coefficient of variation on annual real government expenditure in constant 2000 U.S. dollars for the period 1998 to 2008 is employed as a proxy to gauge the extent of the application of fiscal policy. The coefficient of variation for each country is computed using real government

expenditure data abstracted from the World Bank's World Development Indicators. It is assigned the variable name CVGOVT.

In order to test the hypothesis that public debt reduces the effectiveness of fiscal policy with regard to economic performance, an interaction variable is created. The interaction term is equal to the coefficient of variation of government expenditure (CVGOVT) multiplied by the percent of public debt to GDP for the year 2008. The percentage of public debt to GDP for the year 2008 is taken from the dataset on public debt by Jaimovich and Panizza (Jaimovich and Panizza 2010). The interaction term is labeled with the variable name CVGOVT*PUBDEBT. Of course, if it is true, as hypothesized, that higher levels of public debt reduces the effectiveness of government spending, then one would expect the interaction variable, CVGOVT*PUBDEBT, to be negative and significant when used in combination with the fiscal policy variable, CVGOVT, as a regressor on growth.

The most important control variable considered is the level of economic development. To capture the extent of economic development, real GDP per capita in constant 2000 U.S. dollars for the year 2005 is employed. The data comes from the World Bank. The development variable is given the variable name GDPPC.

Secondarily, two other control variables are considered. They are the extent of globalization and government size. Trade openness is measured by the percentage of the sum of exports to imports to GDP for the year 2005, and the index for the size of government is the percentage of government spending to GDP for 2005. Both variables come from the World Bank. The trade openness variable is identified with the variable name TRADETOGDP and the government size variable with the name GOVTTOGDP

III. THE MODEL:

The model consists of two equations. They are as follows.

$$G = f(F, C) \quad \delta G / \delta F > 0$$

$$\Delta G / \Delta F = h(D) \quad \delta(\delta G / \delta F) / \delta D < 0$$

In the equations, G is the long run growth performance of the economy, F is the extent of government fiscal policy use, D is the amount of public debt, and C is a set of control variables.

The first equation expresses the notion that economic growth depends on the pursuit of fiscal policy and is positively related to its employment. The second equation mathematically articulates the hypothesis that the effectiveness of fiscal policy falls with increases in the level of public debt.

IV. THE EMPIRICAL FINDINGS:

Table I shows cross country regressions using ordinary least squares of percentage average annual growth rate over ten years on the government fiscal policy variable, CVGOVT, and the fiscal policy public debt interaction variable, CVGOVT*PUBDEBT.

TABLE I
CROSS COUNTRY REGRESSIONS OF AVERAGE ANNUAL REAL PERCENTAGE GROWTH RATE IN REAL 2000 U.S. DOLLARS FROM 2000 THROUGH 2008 ON FISCAL POLICY ACTIVITY AND OTHER VARIABLES

	(1)	(2)	(3)	(4)	(5)	(6)
CONSTANT	2.537 (7.00) *	3.103 (9.04) *	3.312 (8.00) *	2.820 (9.00) *	2.205 (5.20) *	3.095 (5.15)*
CVGOVT	12.40 (8.85)*	10.77 (5.90)*	14.48 (6.51)*	17.84 (7.70)*	18.81 (8.01)*	17.62 (7.38)*
CVGOVT *PUBDEBT			-0.2122 (-2.94) *	-1.163 (-2.34) **	-1.476 (-2.87) *	-1.361 (-2.66) *
GDPPC		.000046 (-2.84)*		-0.000044 (-3.06)*	-0.000046 (-3.23)*	-0.000038 (-2.59)**
TRADETOGDP					.0077 (2.18)**	.0081 (2.31)**

GOVTTGDP						-.0582 (-2.06)**
RSQ	.268	.311	.439	.480	.499	.516
N	136	135	132	131	128	128

The table is set-up with the first column providing a list of the potential explanatory variables, and with each column subsequent to the first column containing the results from a single regression run. The estimated coefficients appear as the topmost numbers in the body of table. The individual t-statistics are right under the estimated coefficients (in parenthesis). The equations are numbered in the in the first row, and the last two rows provide the r-squared values (RSQ) and the number of countries entering the equations (N). A single asterisk (*) under the individual t-statistic indicates significance at the one percent level of significance or better and two asterisks (**) indicate significance at the five percent level of significance or better.

Table I contains six equations. The first is a regression of economic growth on the government activity variable, the coefficient of variation in government spending, alone. The second looks at the effect of government fiscal policy on growth, after adjusting for the level of economic development. The third equation adds the interaction term, the coefficient of variation on government spending multiplied by the percentage of public debt, in order to see whether the effect of government activity on economic growth is dampened by higher levels of public debt. The fourth equation adjusts equation three for the level of economic development. The last two equations add two other control variables to equation four. The fifth equation adds a measure of trade openness, the percentage of exports plus imports to GDP, and the sixth adds a measure of the size of the government, the percentage of government spending to GDP.

If, in reality, government expenditure activity positively effects economic growth then one expects, in the growth regressions in table I, to find a positive and significant sign on the coefficient for the government expenditure activity variable, CVGOVT, and if, in the real world, public debt dampens the effectiveness of government activity, then one expects to find a negative and significant sign on the coefficient for the interaction variable between government expenditure activity and public debt, CVGOVT*PUBDEBT, when the variable appears in the growth regressions of table I.

The results are consistent with the hypothesis that government activity, government fiscal policy, is positive for economic growth, and the hypothesis that higher levels of debt reduce the effectiveness of government activity on economic growth.

The government activity variable, CVGOVT, is positive and significant at the one percent level or better in each of the six equations of table I. Government activity is positive and significant on economic growth when used alone (equation 1), when adjusting for the level of development (equation 2), and when adjusting for the interactive effect between government spending and public debt, the level of economic development, and the other two control variables (equation 6).

The government activity public debt interaction term is significant at the one percent level of significance in three of the four equations in which it appears and is significant at the five percent level in the other equation. In all four equations, it has a positive sign indicating that higher levels of public debt reduce the effect of any given amount of government activity on economic growth.

The three control variables, the level of economic development, the extent of globalization, and the size of the government, also behave appropriately.

V. CONCLUSION:

The cross country regression analysis provides evidence in support of the hypothesis that a government's ability to influence the economy through fiscal policy is weakened when there is excessive public debt. As a result, care must be taken to avoid debt build-up since the consequence of higher debt is likely to be reduced economic growth emanating from greater constraint on the government's ability to maintain demand in the economy. As economic growth is the vehicle for improvement in the standard of living, policymakers and the public at large need to be made aware of the growth inhibiting potential of public debt so as to make sure public debt is kept in check and under control.

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