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"Economic Growth, Expanding Role of Government, and Fiscal Policy in Ghana: 1965-2004."

by
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Introduction

It has long been observed that as economies develop and grow, their expenditures on public services and regulations also increase even at a higher rate, than their economic growth. Adolph Wagner who pioneered the empirical test of this observation found that the elasticity of government expenditures with respect to income was greater than unity. Among the reasons for this observation is the fact that as economies grow, the role of government and its expenditures increase even faster because population in urban areas increases which in turn places more demand on social amenities such as road networks, electricity, good drinking pipe borne water, refuse collection and extensive sewer systems. Additionally, expenditure on education, security services and protection of people and property, health services, and many more public goods become urgently needed to meet the social and political needs of the growing population, especially in the urban areas. Wagner's law therefore sees economic development and growth as a factor that causes more than proportional share in growth of government expenditures.

On the other hand, during the Great Depression, John Maynard Keynes observed that relying on the views of classical economists that market forces are invisible hands that must be left unfettered by nations and their governments to efficiently drive economic growth, hindered the economic recovery process from the mass unemployment of both people and resources which brought in their wake untold misery and poverty to the world from 1929 to 1945. In his 1936 *General Theory*, he advised nations and their governments to stop relying on the self correcting mechanism of market forces to pull them out of the massive unemployment during the Great Depression, and rather lead their economies to economic recovery and growth by actively engaging in public economic activities. His recommendation on how to bring nations from the Great Depression led to the birth of fiscal and monetary policy or the field of macroeconomics. He called on governments to spend more money in

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building road networks, bridges, social infrastructures, hospitals, etc. which were destroyed by the Second World War (WW2). In response to his recommendation the Marshall Plan was launched by President Franklin Roosevelt of the US in the New Deal, and the expanding role of government in spending and other public activities and regulations pulled the world from the Great Depression shortly after the WW2.

Thus, whereas, Wagner's law suggests that economic growth causes growth in government expenditures, Keynes' views which are dubbed as Keynesian economics suggest that growth in government expenditures causes economic growth and development. It is in the light of these two views that the current study wants to find out whether the economy of Ghana exhibits Wagner's law or Keynesian economics over the period 1965 to 2004. This problem has been examined in studies for several developed countries and some developing countries, but we are not aware of any study which employs Ghana's data to address this problem, hence our task for this study.

We shall also study the causal relationship between government expenditures and tax receipts. As nations and economies experience economic growth, their government expenditures and activities also increase even faster and thereby cause their national debts to grow exponentially. To bring national debts under control, nations must reduce their deficits, and there are varying views among economists as to the best means to achieve this objective. Some economists believe that the best way of reducing the national debt is to reduce the tax revenues of governments. Milton Friedman believes that governments are often unrestrained when it comes to spending. He argues that the only way of controlling government spending is by reducing tax receipts. He finds any attempt of governments to raise taxes to reduce the fiscal deficit and the national debt to be the principal source of feeding higher spending.

James Buchanan and Richard Wagner (1977, 1978) also attribute high deficits to high government spending. However, in their view to reduce deficits and by extension the growing debts of nations, governments must be convinced to spend less and the most effective way of achieving this goal is by imposing higher taxes on the public to finance government spending. In their view, deficit finance occurs when the government employs indirect taxes in the form of printing money which creates inflation and higher interest rates due to crowding out effect but because the public suffer from money illusion, they allow the government to expand by increasing fiscal spending. It is only when they are subject to direct tax hikes that the public realize the ills of a growing government and demand that their government reduce spending. Buchanan-Wagner therefore view national debt as a net wealth created by accumulated deficit which results from politicians taking advantage of money illusion suffered by the public or voters. Deficit spending therefore makes government activities cheaper so it leads to high government spending, whereas a tax hike causes people to demand that their governments reduce their spending and behave responsibly.

Therefore both Friedman and Buchanan-Wagner consider changes in taxes to cause changes in government spending, except that in the case of Friedman, higher taxes cause higher spending, whereas in the case of Buchanan-Wagner, higher taxes cause people to force their governments to reduce their spending.

Robert Barro (1974) on the other hand argues that increases in government spending cause budget deficits which feed into national debts. As a result, governments are forced to increase taxes or borrowing to finance their debts. In what is commonly known as the Barro-Ricardian Equivalence, an increase in governments spending which causes budget deficits and accumulates into a national debt problem is ultimately paid off by higher taxes either now or in the future even though in the short term governments can resort to borrowing. Thus in the view of Barro, national debt is not a net wealth to households. This means that increase in government spending causes an increase in taxes, so as a policy, when a country is faced with a debt problem, it should cut its spending.

There are others who think that taxes and government spending are interrelated because they are determined in tandem. If that is the case then the causal relationship should be bi-directional. Others also think that budgetary processes of the government are determined through political processes which are determined along the lines of party interests and are often in constant conflict with each other. As a result, government spending which is one of the outcomes of such budgetary processes is determined in a conflicting environment so it is not related to taxes. This view implies that there is no causal relationship between government spending and taxes.

In this study, we will also examine empirically whether increases in government expenditures cause increases in tax receipts as proposed by Barro or whether increases in tax receipts cause increases in government spending as proposed by Friedman and Buchanan-Wagner; in the case of the latter, we shall also attempt to find out whether Friedman's view or Buchanan-Wagner's view holds for the country. We note that if Friedman's view is true for the country, then government expenditures and tax receipts will be directly related so the policy prescription is to cut taxes. If on the other hand we find out that Buchanan-Wagner's view holds for the nation, then taxes will be inversely related to government expenditures, in which case tax hikes will be required to reduce the deficits and the national debt. If Barro's view holds we shall recommend that the government cuts spending to either reduce fiscal deficits and national debt or as a condition for the public to benefit from a tax cut. A bi-directional causal relationship will imply that either a tax change or change in government spending or both will be required to control the deficits and the growing national debt problem. An independent relationship between government spending and taxes will mean that taxes are unrelated to government spending because the national budgetary processes are either determined along antagonistic party lines or the constitution separates institutions that allocate government outlays from those that collect tax receipts.

The paper is organized along the following format. In Section 2, the empirical results on Wagner's law are reported and discussed. It is followed by the presentation and discussion of the empirical results on the causal relationships between government spending and tax receipts. The paper is summarized and policy recommendations gleaned from empirical results are presented to conclude the paper in Section 3.

2. Empirical Results

Granger (1969) defines causality in terms of errors associated with forecasting a variable. If y is predicted by using all

available information (U) and the associated forecast error is $\sigma^2(y/U)$, and it is again predicted using all available information except x and the forecast error is $\sigma^2(y/U\text{-}x)$, and $\sigma^2(y/U) > \sigma^2(y/U\text{-}x)$, then x causes ($\Rightarrow$) y. In an operational form, Granger causality is defined by using past information instead of all available information. Thus, if y is predicted by using all of its past information ($\bar{y}$) and the associated forecast error is $\sigma^2(y/\bar{y})$ and it is again predicted using both its own past information and past information of x ($\bar{x}$) and the associated forecast error is $\sigma^2(y/\bar{y},\bar{x})$, then $x \Rightarrow y$ if $\sigma^2(y/\bar{y},\bar{x}) < \sigma^2(y/\bar{y})$. In a trivariate model we will expect the forecast error associated with past information of the three variables to be smaller than the forecast error from its own past.

Data

Data used are collected from various issues of the International Monetary Fund's *International Financial Statistical Yearbooks*. The notations of the variables are as follows: Y is gross domestic product or GDP, G is government expenditures, X is taxes, BD is budget deficits, CPI is consumer price index using 1995 as the base year, Pop is population, and R is interest rates taken from Treasury Bills Rates. The sample period is 1965 to 2004 which gives us 39 years. In different estimation the sample size may vary due to either the number of lags used or the estimation techniques.

Discussion

The results in Table 2 show that with the exception of of Musgrave, Mann and Dritsakis and Adamopoulos versions, all the remaining traditional versions yield income elasticity of government activities (or the elasticity of government expenditures with respect to income) coefficients of more than unity, which support Wagner's law in Ghana.

Correction of serial correlation problem resulted in the elasticity of income being greater than unity and significant at 0.01 levels which support Wagner's law. Our versions also support Wagner's law as our income elasticity coefficients are also greater than unity with the exception of our modification from Gupta-Michas model which yield 0.956 to 0.983. All of our results are significant at 0.01 levels, and robust: the diagnostic tests show that there are no serial correlation and heteroscedasticity problems, and the functional forms are also correct.

The Johansen's cointegration results without trends and intercepts reported show that there are at most two cointegrated equations. This means that there are possibly two endogenous variables among the four variables, namely: government expenditures (g) and tax receipts (x).

We also tested Granger causality between the variables using the first difference form of the variables. Results show that changes in interest rates cause changes in economic growth; changes in economic growth cause changes in government expenditures; changes in both economic growth and government expenditures independently cause changes in taxes; and finally, changes in taxes cause changes in interest rates. The results therefore support Wagner's law as was reported earlier.

We note that the results are robust, as judged by the diagnostic tests, and the stability of coefficients test. The ARDL estimator which estimates error-correction model without the pre-condition of having all the variables integrated at the same order also confirms that Wagner's law holds in Ghana over the long-run, and in the short

term, as changes in economic growth cause changes in government expenditures. Additionally, changes in government expenditures cause changes in taxes, among others. The estimated error-correction terms are statistically significant, and show that the speed of adjustment to correct for long-run deviation from equilibrium, ranges from -0.34 to -0.03. The speed of Wagner's law or economic growth causing changes in government expenditures is -0.26, and the speed of changes in government expenditures causing taxes is -0.34. The long-run elasticity of public expenditures with respect to changes in income is -1.09.

Stability tests using both cumulative sum of squares (CUSUMSQ) and cumulative sum (CUSUM) of recursive residuals are shown in Figures 2 and 3. To further examine the robustness of results, we used the ARDL estimates to forecast our variables of interest. The forecast of taxes using government expenditures as policy or predetermined variables, and government expenditures using income as policy or predetermined variables captured both downturns and upturns of actual values of taxes; also actual values of government expenditures match predicted values.

3. Conclusion

The empirical evidence provided in the study by using the earlier specifications of Wagner's law by Peacock-Wiseman, Goffman, and Gupta-Michas, and our own modified versions which account for changes in prices because of inflation tendencies in economies of the world in recent times, support the law's application in Ghana. Thus, economic growth results in a more than proportionate share in growth of government expenditures.

We do not find government spending to stimulate economic growth in the country. This means that Keynesian-type fiscal expansion cannot lead to economic growth, although it may crowd out private businesses. Economic growth should be the source of expanding the activities of the government. Furthermore, changes in government expenditures cause changes in government tax receipts.

We conclude that Barro's view which suggests that government expenditures cause government tax receipts has been strongly supported by the Ghanaian data. Both views of Friedman and Buchanan-Wagner on changes in tax receipts causing changes in government expenditures do not hold in the country. Thus, although, the Barro-Ricardian Equivalence contention that taxes and deficit are equivalent means of financing government expenditure has not be empirically tested in the study, we have provided ample evidence to support the fact that the optimum policy for the country to deal with its growing debt is to cut government expenditures. Apart from the obvious crowding out effect of the growing deficits and debt, we caution the government not to depend on recent positive trends in external grants and funding to continue the trend of sharply rising fiscal deficits. The empirical evidence clearly shows that the country will be better served not by relying on government's activities to lead economic growth, but by relying on economic growth to bring about expansion in government activities. After all, the government can only facilitate economic growth; it cannot be an engine of economic growth in the country.

Figure 1a: Budget Deficit as a share of GDP

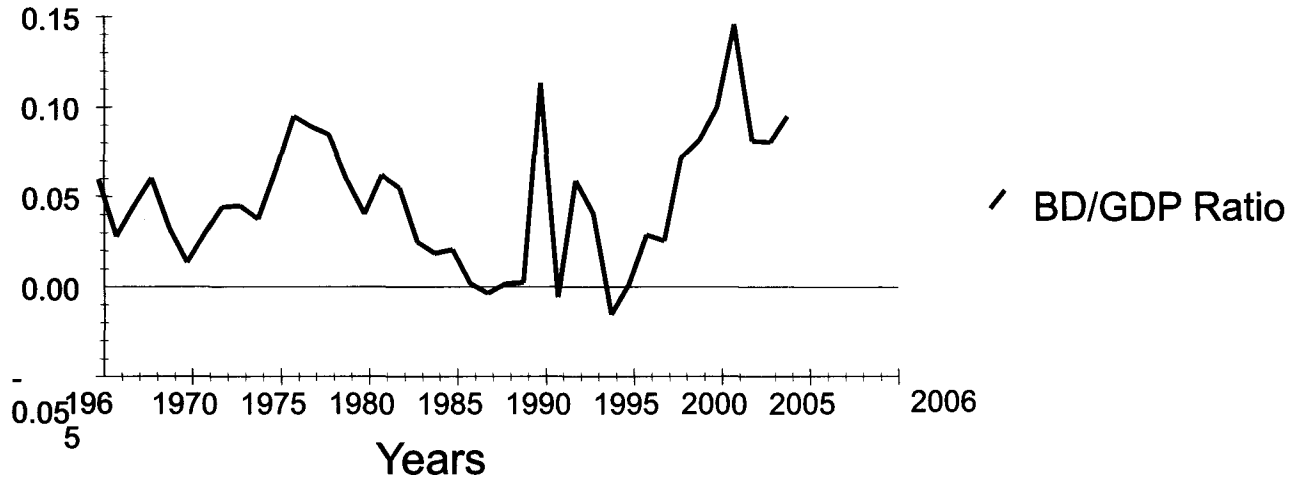


Figure 1b: Budget Deficit in millions of cedis

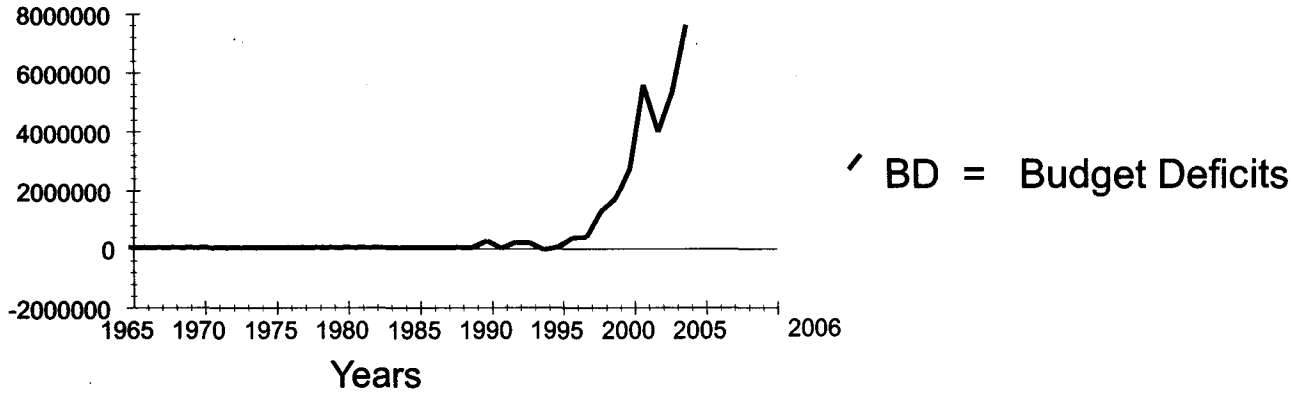


Table 3: Estimates of the Elasticity Coefficients of Ghartey's Versions of Wagner's Law

Version	Elasticity	$\overline{R}^2$	DW	F(k,n-k-1)	$\chi^2_{SC}(1)$	$\chi^2_{FF}(1)$	$X^2_H(1)$
Goffman's Version (1.2)							
OLS	1.132	0.990	0.258	3408.5*	24.861*	24.681*	0.962
	[58.383]*						
DOLS	1.132						
	[59.333]*						
CORC	1.121	0.997	1.722	6273.0*			
	[14.439]*						
Peacock-Wiseman's Version (1.1)							
OLS	1.024	0.992	0.252	5064.1*	28.809*	30.558*	0.005
	[71.163]*						
DOLS	1.024						
	[34.255]*						
CORC	1.052	0.998	1.758	9894.2*			
	[20.933]*						
Musgrave's Version (1.3)							
OLS	0.042	0.111	0.260	5.129*	24.505*	25.010*	0.614
	[2.265]**						
DOLS	0.042						
	[1.153]						
CORC	0.056	0.777	1.746	56.753*			
	[0.890]						
Gupta-Michas' Version (1.4)							
OLS	1.042	0.990	0.260	3211.1*	24.505*	25.010*	0.917
	[56.666]*						
DOLS	1.042						
	[28.842]*						
CORC	1.056	0.997	1.746	5904.0*			
	[16.761]*						
Mann's Version (1.5)							
OLS	0.023	0.043	0.252	2.769**	28.809*	30.558*	0.094
	[1.664]						
DOLS	0.023						
	[0.801]						
CORC	0.052	0.764	1.758	62.489*			
	[1.036]						
Dritsakis-Adamopoulos' Version (1.6)							
OLS	0.457	0.169	0.282	7.697*	24.870*	14.688*	0.693
	[2.774]*						
DOLS	0.457						
	[1.932]**						
CORC	0.158	0.778	1.858	57.170*			
	[0.612]						

Note: If ε is an error term which follows an AR(2) behavior then the error term is expressed as $\varepsilon_t = \rho^2\varepsilon_{t-2} + \rho\varepsilon_{t-1} + u_t$, where u is a white noise innovation. See also Table 2. CORCAR(2) is a Cochrane-Orcutt estimation where the error term is expressed as a second-order autoregressive process.

Table 6: Autoregressive Distributed Lag Estimates of Long-run and Error Correction Model for Validating Causal Relationships; 1965-2004.

H_0: No Causal Relationship	ARDL Order (p,q,s)	Long-run Estimates	Coef. Of EC Term	Causal Direction
Incomes do not cause Gov't Expenditures	(1,0) n = 39	1.087 [40.504]*	-0.262 [5.079]*	$\Delta y_t \Rightarrow \Delta g_t$
Gov't Expenditures do not cause Incomes	(1,1) n = 39	1.011 [4.817]*	0.039 [0.438]	$\Delta g_t \Rightarrow \Delta y_t$
Gov't Expenditures do not cause Taxes	(2,0,3) n = 36	0.991 [68.529]*	-0.336 [4.357]*	$\Delta g_t \Rightarrow \Delta x_t$
Taxes do not cause Gov't Expenditures	(1,1,1) n = 39	1.052 [15.085]*	-0.134 [1.288]	$\Delta x_t \Rightarrow \Delta g_t$
Incomes do not cause Taxes	(2,0,3) n = 36	1.078 [30.199]*	-0.223 [4.037]*	$\Delta y_t \Rightarrow \Delta x_t$
Taxes do not cause Incomes	(1,1,1) n = 39	0.977 [21.083]*	0.112 [3.845]*	$\Delta x_t \Rightarrow \Delta y_t$
Incomes do not cause Interest Rates	(1,1) n = 39	0.115 [2.520]	-0.280 [2.171]***	$\Delta y_t \Rightarrow \Delta r_t$
Interest Rates do not cause Incomes	(1,0,0) n = 39	8.125 [4.021*]	-0.027 [1.847]***	$\Delta r_t \Rightarrow \Delta y_t$
Taxes do not cause Interest Rates	(1,1) n = 39	6.737 [4.747]*	-0.087 [2.111]***	$\Delta x_t \Rightarrow \Delta r_t$
Interest Rates do not cause Taxes	(2,0,3) n = 36	14.917 [0.407]	0.005 [0.723]	$\Delta r_t \Rightarrow \Delta x_t$
Gov't Expenditures do not cause Interest Rates	(1,0) n = 39	14.866 [1.244]	-0.013 [0.874]	$\Delta g_t \Rightarrow \Delta r_t$
Interest Rates do not cause Gov't Expenditures	(1,0) n = 39	0.114 [2.031]***	-0.223 [1.706]***	$\Delta r_t \Rightarrow \Delta g_t$

Note: In the null hypotheses that states that incomes do not cause government expenditures, incomes are the manipulated or exogenous variables, and government expenditures are the controlled or endogenous variables. $\Rightarrow$Denotes 'cause', so $\Delta g_t \Rightarrow \Delta x_t$ means changes in government expenditures cause changes in taxes. Figures in parentheses are the order of the ARDL, and those in the square brackets are the absolute values of the t-ratios. *, **, and *** denote significant levels at 0.01, 0.05 and 0.10, respectively, EC denotes error correction, and n is the sample size. The EC model specified as ARDL (p, q, s) are two variables ECM where the lag lengths of the EC terms, dependent variable and the independent variable p, q and s, respectively. In the case of an ARDL (p, q, s) of three variables, p is the lag length of the dependent variable and q and s are the lag length of first and second independent variables.

Figure 3b: Income causing government expenditures

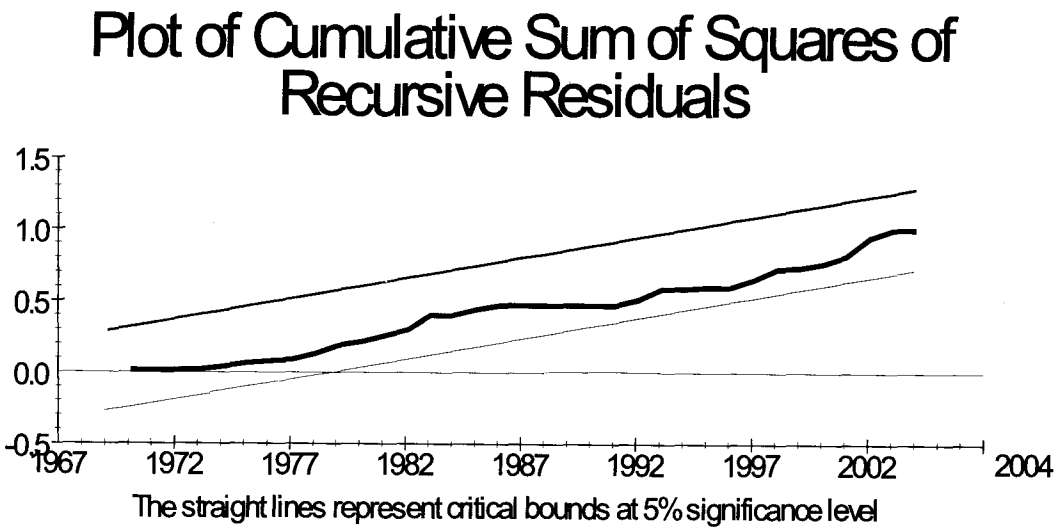


Figure 4b: Government expenditures causing income

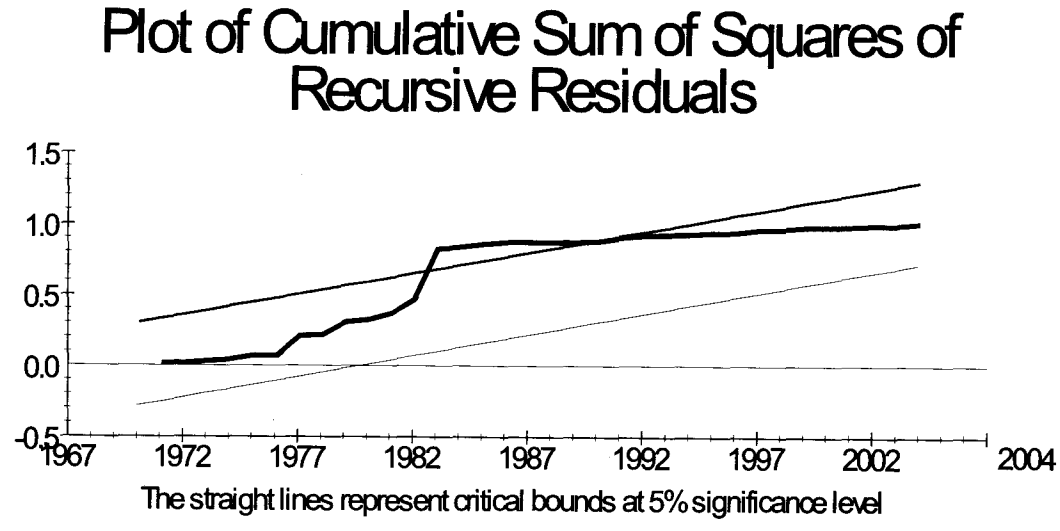


Figure 5b: Government expenditures causing taxes

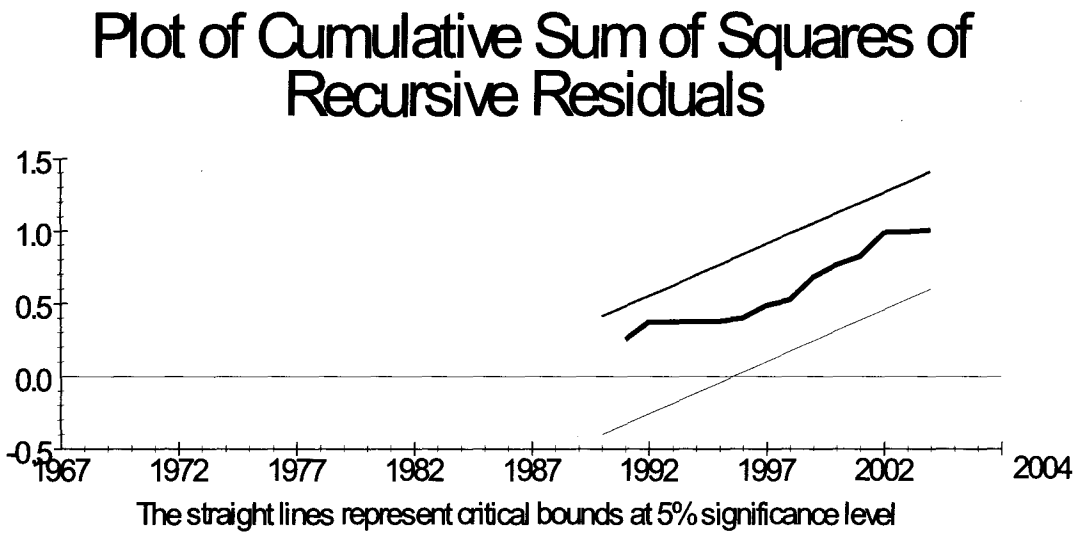


Figure 6b: Taxes causing Government expenditures

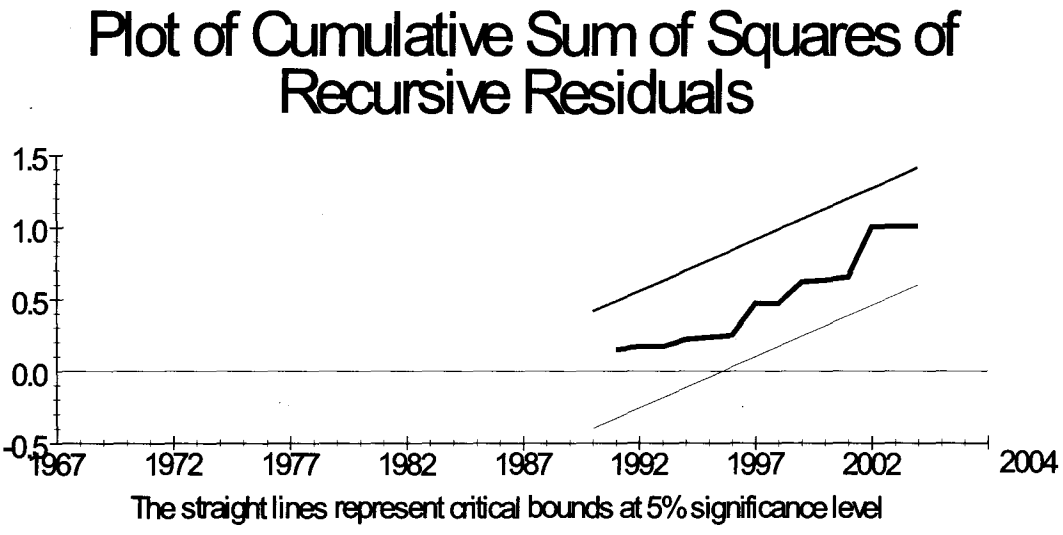


Figure 7: Plot of actual and predicted values of taxes from estimation using lagged government expenditures

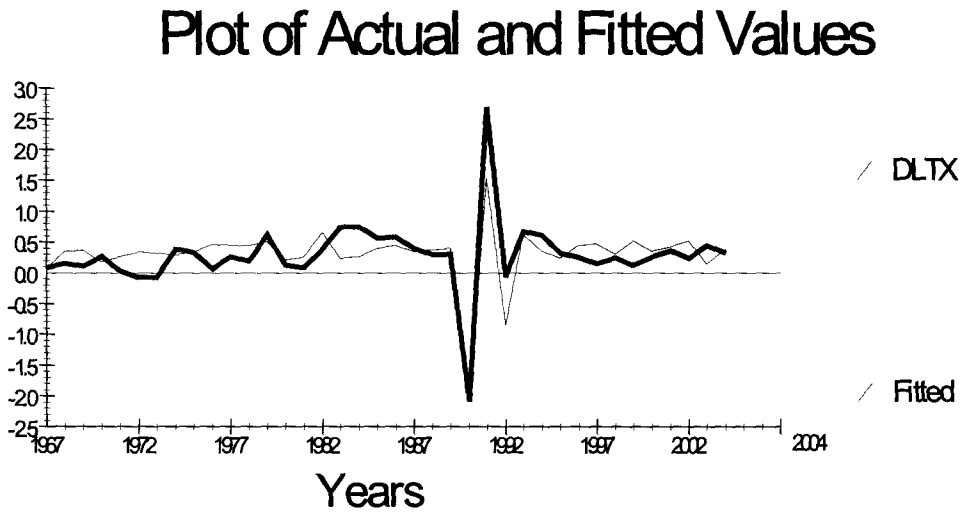
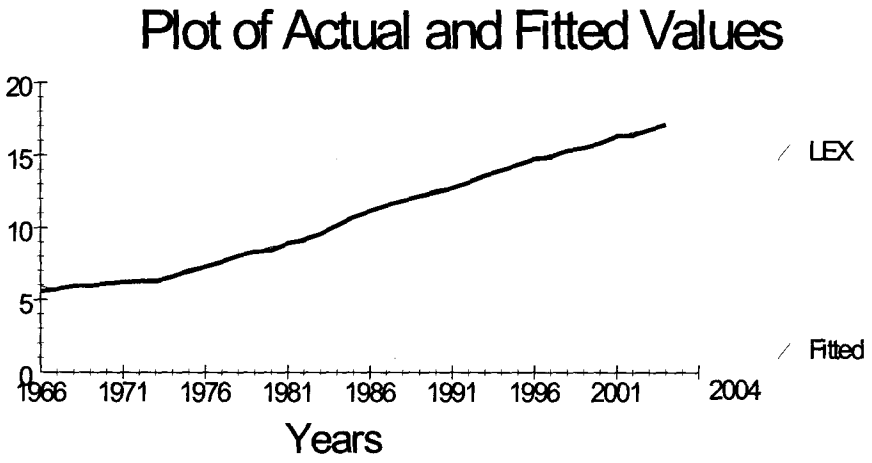


Figure 8: Plot of actual and predicted values of log form government expenditures from estimation using lagged income



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