

AN INVESTIGATION OF THE REAL EFFECTS OF GOVERNMENT EXPENDITURES

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The paper examines the macroeconomic effects of government expenditures. The possible crowding-out effects of government expenditures on private consumption are investigated under the notion that the possible benefits of government spending, as well as the changes in disposable income due to tax changes are both perceived by people — a case of two-sided rationality.

The discussion takes off from the empirical work of Feldstein in defense of the multiplier effect of government purchases, and that of Kormendi about the crowding-out effect of government expenditures on consumption. The paper then tests the implications of the consolidated approach to modeling consumer behavior developed by Barro and Bailey with Philippine aggregate data.

Results show that the various specifications of the consumption function were characterized by significant and large negative effects of government expenditures on private consumption. It is thus concluded that in the Philippines, government expenditures have a strong crowding-out effect on private consumption. This effect tends to dampen rather than raise output and employment.

1. Introduction

Intellectual developments in the analysis of government purchases have shifted in emphasis from the early Keynesian view that government expenditures have a positive and multiplier effect on national income to a new classical view which recognizes the possible crowding-out effects of government expenditures on consumption and investment.

M. J. Bailey (1971) has pointed out that the effects of government expenditures on aggregate demand may be dampened to the extent that government expenditures substitute for private consumption expenditures. Robert Barro (1974) argued that in a Ricardian

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setting whereby future taxes implied by debt issues to finance deficit spending by the government are fully perceived, fiscal policy is irrelevant. In another paper, Barro (1981) argued that in a market-clearing environment which incorporates the effects described by Bailey, government purchases may yield some output effects to the extent that the interest-rate effects of government expenditures induce some intertemporal substitution of labor and leisure on the part of private economic agents. Barro likewise pointed out the need to distinguish between temporary and permanent government purchases, which are analogous to Milton Friedman's (1955) temporary and permanent income.

Martin Feldstein (1982) argued that the effects of government spending imply more than what adherents of the Ricardian equivalence theorem uphold and showed in his empirical work that government spending has relatively little effect on personal consumption, implying the usual multiplier effects.

In this paper, we look at the issue of government expenditure in the Philippines and its real effects. Interest in an examination of the pattern of government expenditures in the Philippines has increased as a result of the 1983 economic crisis. The years beginning 1973 are of special interest. During these years, there was a rapid increase in government expenditures which led to large deficits in the government budget. Beginning 1977, there was a marked slowdown in the growth rate of output, which culminated in a general contraction in 1984. It has been conjectured that the pattern of government expenditures and the accompanying deficits may have contributed in large measure to the mediocre performance of the whole economy (see e.g., de Dios, 1984). At the outset, this turn of events raises the issue of the real effects, i.e., output and employment, of government spending.

This paper deals with the possible crowding-out effects of government expenditures and their output effects. The crowding-out effects of government expenditures on private consumption are investigated under the notion that the possible benefits of government spending as well as the changes in disposable income due to tax changes are both perceived by people, a case of two-sided rationality.

Section 2 starts with Feldstein's empirical work in defense of the multiplier effect of government purchases. Then it goes on to Kormendi's (1983) empirical work supporting the hypothesis of Bailey and Barro about the crowding-out effect of government expenditures on consumption. The third section reports on the em-

pirical implementation of some of the econometric procedure methods of Feldstein and Kormendi using Philippine data.

2. Government Expenditures, Public Debt, and Private Consumption

A. *The Relevance of Fiscal Policy*

Feldstein (1982) deduces from the Ricardian equivalence hypothesis five implications that can be tested with aggregate data on household consumption. He adds as a further testable implication within the same framework the more extreme fiscal impotence proposition that even government spending does not add to aggregate demand.

The framework of analysis is a consumer expenditure function relating real per capita consumer expenditures to a measure of real permanent income, real wealth, and various fiscal variables:

$$(1) \quad C_t = b_0 + b_1 Y_t + b_2 W_t + b_3 SSW_t + b_4 G_t + b_5 T_t \\ + b_6 TR_t + b_7 D_t,$$

- where :
- C_t : consumer spending in year t
 - Y_t : permanent income
 - W_t : market value of privately-owned wealth at the beginning of year t
 - SSW_t : measure of the value of future social security benefits
 - G_t : government expenditures
 - T_t : tax collections
 - TR_t : government transfers to individuals
 - D_t : net debt of the federal, state and local governments.

The strong form of the fiscal impotence view implies that an increase in government spending by one dollar with all other variables constant must induce a one dollar reduction in consumer spending: $b_4 = -1$.

The Ricardian view suggests that b_4 is negative but small since it reflects the first year response of households to a one dollar increase in the wealth of a taxpayer whose economic life is effectively infinite. Although the more general fiscal expectations approach

of Feldstein is consistent with a wider range of responses, it cannot be distinguished from the Ricardian approach on the basis of b_4 .

A second prediction of the Ricardian hypothesis is that a change in taxes has no effect when the levels of government spending and transfers are held constant: $b_5 = 0$.

A third suggestion is that an increase in transfer payments financed by a government deficit should have no effect on current consumption. While households have more spendable income, they also have a new future tax liability: $b_6 = 0$.

Feldstein argued that the anticipation of social security retirement benefits causes individuals to reduce their own saving for retirement and therefore to increase their consumption. In contrast to this view, Barro's fourth implication argues that the promise of future social security benefits should not decrease saving and increase current consumption because the taxes that will finance the social security benefits represent a household liability that, over the infinite future, is as large as the benefits themselves. If $b_3 = 0$, households save to compensate future generations for their extra burdens, while if b_3 is positive, increases in future social security benefits raise current consumption.

The fifth emphasis of the Ricardian equivalence view is that the public debt does not represent net wealth at all, while the alternative view is that the anticipation of future debt service obligations only partially offsets the value of the debt. This alternative view that households treat public debt as a net contribution to wealth means that $b_7 + b_2$ is positive whereas the Ricardian equivalence view implies that $b_7 = b_2$.

In estimating Equation (1) the most serious problem is that an exogenous increase in consumer spending tends to boost aggregate demand in a way that raises nearly all types of tax collections. This introduces a positive correlation between taxes and consumer spending that biases the coefficient of the tax variable toward zero and therefore in favor of the fiscal impotence and Ricardian hypotheses. Because of the bias introduced in this way, spurious support for the Ricardian hypothesis and the view that fiscal policy is impotent has been provided by previous estimates. The coefficient of the tax variable, however, becomes larger than the ordinary least squares estimate if instrumental variable estimation is used.

Feldstein draws our attention to the ordinary least squares estimates. The coefficient b_5 is very small, and the sum $b_2 + b_7$ is

not significantly different from zero. But while b_4 is negative, and b_3 insignificant, the large coefficient on government transfers conflicts with the assumption of fiscal neutrality. This evidence contradicts the view that variations in government spending induce equal offsetting changes in private consumption.

The instrument that Felstein used for instrumental variable estimation is the lagged value of the tax variable itself. The instrumental variable estimates give a small and insignificant coefficient for the government expenditure variable, while the coefficient of the tax variable becomes large. The coefficient of the debt variable lends no support to the hypothesis that $b_7 = b_2$, while the coefficient of the transfers variable remains approximately equal to one.

When the government debt variable is removed from the specification, the coefficients of the remaining variables do not change substantially but the reduced collinearity lowers the estimated standard errors.

In conclusion, the evidence presented in Feldstein's paper indicates that changes in government spending or taxes can have substantial effects on aggregate demand. Each of the implications of the Ricardian equivalence hypothesis is contradicted by the data.

The results are instead consistent with the view that consumers interpret current change in tax rates or in government spending as signals of possible future changes.

B. Government Spending and Private Sector Behavior

Kormendi (1983) draws on the work of Bailey and Barro to develop an approach to modeling private sector consumption-saving behavior based on rational evaluation of the consequences of government fiscal policy.

He distinguishes between that portion of government spending that yields utility to the private sector in the current period, government consumption (GC_t), and that portion that yields utility to the private sector in future periods, government investment (GI_t). The difference between the resource cost of government-provided goods and services and their value is termed government dissipation (GD_t). Government dissipation is a direct drain on disposable income, which is defined as $Y_t - GD_t$, where Y_t is income from all sources.

Total consumption (TC_t), defined as the sum of government and private consumption, is a constant fraction of the estimated permanent component of total disposable income, which gives rise to the following total consumption function:

$$(2) \quad TC_t = a_0 + a_1 Y_t + a_2 GD_t + a_3 W_t + u_t$$

where W_t is wealth from all sources and u_t is a stochastic term. Using the definition $TC_t = PC_t + GC_t$, where PC_t is private sector consumption, we can rewrite Equation (2) as

$$(3) \quad PC_t + GC_t = a_0 + a_1 Y_t + a_2 GD_t + a_3 W_t + u_t.$$

We can then obtain a specification for a private sector consumption function by moving GC_t to the right-hand side of the equation:

$$(4) \quad \begin{aligned} PC_t &= a_0 + a_1 Y_t + a_2 GD_t - GC_t + a_3 W_t + u_t \\ &= a_0 + a_1 Y_t + a_{21} GD_t + a_{22} GC_t + a_3 W_t + u_t \end{aligned}$$

where it can be expected that $a_{22} = -1$.

Kormendi then considers an empirical specification of the private sector consumption function in the following modified version of (4):

$$(5) \quad \begin{aligned} PC_t &= a_0 + a_{11} Y_t + a_{12} Y_{t-1} + a_2 GS_t \\ &\quad + a_3 W_t + a_4 TR_t + u_t \end{aligned}$$

where TR_t is transfer payments and the effects of GC_t , GI_t , and GD_t , are collapsed into a single variable GS_t . Notice that the government spending variable has found its way into the right-hand side of the equation as an explanatory variable for private consumption behavior.

Kormendi uses the following data series over the period 1929-76: National Income and Product Accounts (NIPA) consumer expenditure on nondurables and services plus an imputed flow from the Bureau of Economic Analysis (BEA) stock of consumer durables as a measure of PC_t ; NIPA net national product as a measure of Y_t ; NIPA government spending on goods and services as a measure of GS_t ; NIPA transfer payments from federal, local, and state governments as a measure of TR_t ; and the stock of private wealth plus human wealth from two other studies as measures of W_t .

Since the data are nonstationary in the levels, Kormendi tries three forms of estimation: OLS in the levels, generalized least squares in the levels, and OLS in the first differences. His results over the three methods give the same conclusion: government spending has a significant negative coefficient, indicating a crowding-out effect on private consumption.

Kormendi then uses the definition of personal disposable income, $YD_t = Y_t - TX_t - RE_t + TR_t + GINT_t$, to develop the following augmented version of (5):

$$(6) \quad DPC_t = a_0 + a_{11}DY_t + a_{12}DY_{t-1} + a_2DGS_t \\ + a_3DW_t + a_4DTR_t + a_5DTX_t + a_6DRE_t \\ + a_7DGINT_t + u_t$$

where D is the first-difference operator, TX_t is measured as NIPA government receipts from all sources, RE_t is measured as NIPA corporate retained earnings, and $GINT_t$ is measured as NIPA interest payments by federal, state, and local governments. Under the standard approach, the private sector is assumed to ignore government spending, and $a_2 = 0$. Under the consolidated approach, GS_t affects private consumption negatively, so that a_2 should be negative.

The coefficients for DY_t , DW_t , DTR_t , and DGS_t are virtually the same as those for Equation (5) when (6) is estimated over the full 1930-76 period and over the period 1930-40/47-76, which excludes the war years. The t -statistic for a_2 rejects the hypothesis of the standard approach. The coefficient of TX_t is small in magnitude and estimated precisely enough to reject the hypothesis $a_5 = a_2$ and $a_5 = -a_1$ at the 1 per cent level.

Kormendi tests the "net wealth effect" of the stock of government debt outstanding, GB_t , by augmenting (6) to include a_8DGB_t . Under the standard approach, government bonds are "net wealth" and a_8 should be positive, but the coefficient turns out negative.

The consolidated approach to the private sector consumption-saving decision yields implications for differing effects of the three components of government spending. Kormendi considers the largest category of government spending in the U.S., defense expenditures, DX_t . Wealth-augmenting defense spending he classifies as a form of investment while wealth-maintaining defense spending is a form of government dissipation. Kormendi presented some evidence of the

differing effects of the consumption and investment components of government spending implied by the consolidated approach.

The most serious problem in the estimation of equations (5) and (6) is the identity character of the national income accounts data. *Ex post* national income accounts data always yield the identity $Y = C + I + G + X - M$, where X = exports and M = imports. This introduces a negative correlation between private consumption and government spending that biases the coefficient of the government spending variable in the private sector consumption function toward a negative figure and therefore in favor of the hypothesis of the consolidated approach.

C. Evidence in the Philippines

1. Testable Implications

The consolidated approach to modeling consumer behavior has implications about the multiplier effect of government expenditures that can be tested with Philippine aggregate data.

1.1 A-la Feldstein

We can start with

$$(7) \quad C = a_0 + a_1 Y_d + a_2 W$$

where :

C : private consumption in real terms

Y_d : real disposable income

W : real wealth

$$\text{Let } Y_d = Y - T + R$$

where :

Y : real gross national product

T : real taxes

R : real transfers.

Furthermore, let W be represented by public debts D , as in the formulation of Albert Ando and Franco Modigliani (1963) where public debts are regarded as net wealth, along with corporate retained earnings, E . Hence the model for estimation is

$$(8) \quad C = b_0 + b_1 Y + b_2 T + b_3 R + b_4 L + b_5 E$$

Then we can augment the above by adding government expenditures G , or run (8) replacing D with G .

1.2 A-la Kormendi

Kormendi starts with

$$TC = a_0 + a_1 Y + a_2 W + a_3 GD.$$

Then, if $TC = PC + GC$,

$$(9) \quad PC = a_0 + a_1 Y_d + a_2 W + d_3 GD + a_4 GC$$

where $a_4 = -1$.

We can run the following variant of (9):

$$(10) \quad C = a_0 + a_{11} Y_t + a_{12} T + a_{13} R + a_{21} D \\ + a_{22} E + a_3 G.$$

This is essentially the same as the augmented equation (8). The difference between the two lies in the methods of estimation. Feldstein estimates his equations using the ordinary least squares (OLS) method and the instrumental variable method with a lagged value of T as the instrumental variable. Kormendi estimates his equations using the OLS method in the levels, the generalized least squares method in the levels, and the OLS method in the first differences.

1.3 Incorporation of Other Influences on Consumption

Milton Friedman (1955) suggested that the true consumption-income relation lies between permanent consumption and permanent income. Don Patinkin (1965) stressed the importance of the relationship between consumption and real money balances. We can incorporate these effects into the consumption function:

$$(11) \quad C = a_0 + a_1 Y^P + a_2 Y + a_3 M$$

where:

Y^P : permanent real income

M : real money balances

This equation can be estimated with and without G . It is especially useful to incorporate real balance effects in order to capture more

wealth variables in addition to D , especially since we have no good data for physical wealth.

Finally, we estimate using per capita consumption. Alternatively, we put population H on the right-hand side of the regression variables.

1.4 Decomposition of G and H

The last part of Kormendi's paper breaks down total government spending, G into consumption, GC , and investment, GI . Dante Canlas (1985) has done the same in his paper investigating the short-run aggregate demand effects of fiscal policy in the Philippines. Canlas also decomposes government debt, D , into public internal debt, ND , and public external debt, XD . These variations are also worth trying out.

2. Data and Variables Used

To estimate (8), we use the following data series over the period 1949 to 1983 obtained from the Gross National Product and Expenditure (GNP) accounts: personal consumption expenditures as a measure of C ; GNP as a measure of Y ; direct and indirect taxes as a measure of T ; social security benefits, other current transfers from general government, and current transfers from the rest of the world as a measure of R ; corporate savings as a measure of E ; and general government consumption expenditures plus government construction as a measure of G . To measure D , we use public internal debt outstanding. All values are in constant 1972 pesos.

Following Kormendi and Feldstein for equation (11), we use Y_{t-1} to reflect any incremental information it may contain as to Y^P . For M , we use the supply of currency in circulation and peso deposits subject to check, in 1972 prices.

Population H is taken from the *International Financial Statistics* of the International Monetary Fund (1983) for the years 1953-82, and from the *World Population* of the U.S. Department of Commerce Bureau of Census (1977) for the years 1948 and 1950-52. The value for 1949 was extrapolated.

We use public internal debt to represent ND and public external debt in dollars to represent XD . These data are drawn from various issues of the National Economic and Development Authority's

3. The Parameter Estimates

Table 1 reports the results of estimating equation (8) in six ways: (1) as is, (2) with a lagged value for T , (3) with the additional variable G , (4) with a lagged value for T and an additional variable G , (5) replacing D with G , and (6) with a lagged value for T and replacing D with G . In these estimates, when G is not included, the Durbin-Watson test shows significant positive autocorrelation. The inclusion of G , which turns out to have a significantly negative coefficient, makes the autocorrelation inconclusive. This can be

Table 1 — Results of Estimating Equation (8)

	Equation					
	(1)	(2)	(3)	(4)	(5)	(6)
Y	.67 (.08) (7.84)	.76 (.09) (7.92)	.85 (.04) (23.24)	.84 (.04) (20.06)	.90 (.03) (29.10)	.90 (.03) (27.00)
T	-.80 (.38) (-2.10)	-1.08 (.40) (-2.71)	-.29 (.16) (-1.86)	-.11 (.19) (-.59)	-.25 (.16) (-1.50)	-.16 (.20) (-.80)
R	-.48 (1.59) (-0.30)	-.80 (1.50) (-.53)	-1.06 (.62) (-1.69)	1.23 (.65) (-1.90)	-.25 (.56) (-.44)	-.48 (.55) (-.88)
D	.48 (.46) (1.05)	.26 (.44) (.60)	.44 (.18) (2.42)	.39 (.19) (2.04)		
E	-.68 (.33) (-2.10)	-.69 (.31) (-2.22)	-.18 (.13) (-1.34)	-.18 (.14) (-1.27)	-.22 (.14) (-1.55)	-.22 (.14) (-1.53)
G			-1.55 (.12) (-12.47)	-1.57 (.14) (-11.16)	-1.55 (.13) (-11.7)	-1.56 (.14) (-10.80)
R^{-2}	.993	.993	.999	.999	.999	.999
$D.W.$.306	.488	1.375	1.531	1.254	1.398

Notes: Standard errors are shown in the first parentheses; t-statistics are in the second parentheses; constant terms were estimated but not reported; the lagged value for T is in columns (2), (4), and (6).

interpreted as a finding in support of the hypothesis that government expenditures are an important explanatory variable for consumption.

The negative coefficients on taxes imply that the Ricardian equivalence hypothesis does not apply to the Philippines, i.e., Filipinos do not perceive deficit spending as equivalent to a balanced budget. The negative and significant coefficients on E indicate that Filipinos look upon retained earnings not as wealth but rather as a deduction from their disposable income.

If future taxes implied by the government debt are not perceived and discounted by the private sector, as it seems from negative coefficients on T , the value of government internal debt outstanding, D , should have a "net wealth effect" on private consumption. The coefficients on D are significantly greater than zero, showing support for the net wealth effect of public debt.

Table 2 represents the results of estimating (10) in OLS form in
 Table 2 – Results of Estimating Equation (10)

	Level	First Difference
Y	.85 (.04) (23.24)	.54 (.07) (7.30)
T	-.29 (.16) (-1.86)	-.19 (.13) (-1.46)
R	-1.06 (.62) (-1.69)	-.46 (.36) (-1.26)
D	.44 (.18) (2.42)	.19 (.14) (1.29)
E	-.18 (.13) (-1.34)	-.13 (.10) (-1.18)
G	-1.55 (.12) (-12.47)	-.37 (.20) (1.91)
\bar{R}^2	.999	.705
$D.W.$	1.375	1.572

Notes: Standard errors are shown in the first parentheses; t-statistics are in the second parentheses; constant terms were estimated but not reported.

the levels and in the first differences, a la Kormendi. Comparing the two estimates shows the OLS in the levels to have a better fit. The OLS levels specification and therefore the estimates are exactly the same as for column (3) of Table 1. Even in the first differences estimate, however, the crowding-out effect is still shown by the significantly negative coefficient on G , although in this case it is no longer one-to-one. The other coefficients reflect the usual Keynesian implications: a positive coefficient on Y that is several standard errors from zero, a positive "net" wealth" effect of D , and a negative coefficient on E . The only unexpected result is the negative coefficient on R .

Table 3 presents the results of estimating the previous specifications in per capita terms. The specifications reported are those with contemporaneous independent variables and in the levels. The coefficients on Y , R , and (most importantly) G are significant

Table 3 — Per Capita Estimations

	(1)	(2)	(3)
Y	.50 (.09) (5.31)	.79 (.06) (14.37)	.87 (.04) (10.87)
T	-.81 (.37) (-2.17)	-.36 (.19) (-1.91)	-.31 (.20) (-1.56)
R	-1.61 (1.00) (-1.60)	-1.19 (.49) (-2.42)	-.66 (.44) (-1.48)
D	.98 (.34) (2.91)	.37 (.18) (2.10)	
E	-.27 (.29) (-.93)	-0.11 (.14) (-.77)	-.13 (.15) (-.82)
G		-1.36 (.14) (-9.55)	-1.46 (.14) (-10.44)
\bar{R}^2	.969	.992	.992
$D.W.$.416	1.322	1.244

Notes: Standard errors are shown in the first parentheses; t-statistics are in the second parentheses; constant terms were estimated but not reported.

and of the same sign as those in the previous estimates. The coefficients on *T* are still significantly negative, while the coefficients on *E* are now no longer significant at the 15 per cent level although they are still significantly negative, like in previous estimates, at the 20 per cent level. The coefficients on *D* still show a significant positive wealth effect.

Table 4 presents the results of (8) and (10) augmented to include *H*. The coefficients on population are positive in the levels and more than five standard errors from zero. Influences as to the negative coefficients on *T* and *G* are, however, basically unaffected. The coefficients on *R* and *E* are insignificantly different from zero

Table 4 - Estimations Augmented with *H*

	(1)	(2)	(3)	(4)	(5)	(6)	First Dif- ferences
<i>Y</i>	.34 (.05) (7.43)	.38 (.05) (7.05)	.61 (.04) (17.09)	.60 (.02) (29.09)	.61 (.04) (16.62)	.60 (.05) (11.06)	.57 (.10) (5.58)
<i>T</i>	-.44 (.16) (-2.73)	-.50 (.18) (-2.77)	-.33 (.06) (-5.84)	-.27 (.04) (-6.67)	-.31 (.06) (-5.36)	-.32 (.10) (-3.04)	-.22 (.14) (-1.52)
<i>R</i>	-.94 (.67) (-2.90)	-2.11 (.66) (-3.18)	-1.51 (.24) (-6.34)	-1.72 (.14) (-12.90)	-1.04 (.22) (-4.72)	-1.38 (.32) (-4.32)	-.41 (.23) (-1.09)
<i>D</i>	.19 (.19) (.98)	.08 (.19) (.44)	.32 (.07) (4.61)	.23 (.04) (5.84)			.18 (.15) (1.20)
<i>E</i>	.15 (.15) (.95)	.12 (.15) (.76)	.00 (.06) (.03)	.00 (.03) (.11)	.01 (.06) (.09)	.01 (.08) (.09)	-.14 (.11) (-1.21)
<i>H</i>	923.50 (79.11) (11.67)	899.65 (81.40) (11.05)	441.74 (62.85) (7.03)	447.14 (37.60) (12.69)	514.51 (62.34) (8.25)	544.40 (93.60) (5.82)	-190.85 (369.58) (-52)
<i>G</i>			-.88 (.10) (-8.51)	-.82 (.07) (-12.42)	-.78 (.10) (-7.50)	-.70 (.16) (-4.28)	-.41 (.21) (-1.94)
\bar{R}^2	.999	.999	.9998	.99995	1.00	1.00	.697
<i>D.W.</i>	1.224	1.110	1.437	1.495	1.244	1.311	1.572

Notes: Standard errors are shown in the first parentheses; t-statistics are in the second parentheses; constant terms were estimated but not reported; the lagged value for *T* is in columns (2), (4), and (6).

in the levels where the fit is better than in the first differences. The coefficient on Y is smaller but more than seven standard errors from zero. Including G in the equation yields a positive coefficient on D .

Table 5 presents the results of estimating (11) in four ways: (1) without G and H , (2) with G but without H , (3) with H but without G , and (4) with G and H . In all four specifications, the co-

Table 5 — Estimations Augmented with Y_{t-1} , M , and H

	(1)	(2)	(3)	(4)
Y_{t-1}	.18 (.39) (.46)	.02 (.20) (.09)	.17 (.23) (.73)	.08 (.20) (.41)
Y_t	.35 (.45) (.76)	.78 (.24) (3.24)	.14 (.28) (.51)	.49 (.28) (1.75)
T	.30 (.59) (.50)	.08 (.31) (-2.6)	-.04 (.36) (-1.1)	-.09 (.31) (-2.8)
R	-1.33 (1.47) (-.91)	-1.20 (.76) (-1.59)	-2.11 (.89) (-2.36)	-1.65 (.79) (-2.10)
D	-.12 (.29) (-.27)	.28 (.16) (1.15)	.07 (.21) (.26)	-.05 (.18) (.83)
E	-.67 (.29) (-2.29)	-.23 (.16) (-1.39)	.07 (.21) (.31)	-.05 (.18) (-2.4)
M	2.04 (.57) (3.61)	.52 (.35) (1.49)	.61 (.40) (1.51)	.45 (.35) (1.30)
G		-1.40 (.18) (-7.96)		-.79 (.35) (-2.28)
H			830.45 (123.20) (6.74)	420.10 (207.74) (2.022)
R^2	.994	.998	.998	.998
$D.W.$	1.158	1.480	1.419	1.493

efficients on Y_{t-1} and T are insignificant. The insignificant coefficient on T indicates that when real balance effects are incorporated, the Ricardian equivalence hypothesis becomes relevant.

In all four estimates, the coefficients on R and M are significant, with R having a negative effect on C while M has a positive effect on C . The negative coefficient on R , present in all previous specifications as well, could mean that in the Philippines households are more sensitive to the social security benefits themselves. The positive coefficient on M confirms the real balance effect on consumption.

When G is excluded from the specification, the coefficients on Y_t and D become insignificant. Any specification in which the coefficient on Y_t is insignificant with respect to C should be considered suspect. Indeed, when G is added, the more reasonable result comes out that Y_d and D have a positive effect on consumption.

When G is included in the specification, its coefficient is highly significant, confirming earlier results about a strong crowding-out effect of government expenditures on private consumption. The crowding-out depicted is greater than one-to-one when population is not included in the estimation. The inclusion of H makes the negative coefficient smaller in absolute value, but still highly significant.

Table 6 presents the result of estimating (11) in per capita terms with and without G . The coefficient on D is positive in both

Table 6 — Augmented Estimations in Per Capita Terms

	(1)	(2)
Y_{t-1}	.50 (.28) (1.80)	.05 (.16) (.28)
Y_t	-.11 (.34) (-.32)	.71 (.22) (3.31)
T	.41 (.51) (.81)	-.16 (.30) (-.54)
R	-2.14 (.90) (-2.37)	-1.32 (.51) (-2.58)

Table 6 (Continued)

	(1)	(2)
<i>D</i>	.52 (.35) (1.51)	.29 (.20) (1.49)
<i>E</i>	-.47 (.28) (-1.69)	-.18 (.16) (-1.12)
<i>M</i>	1.73 (.62) (2.80)	.42 (.38) (1.10)
<i>G</i>		-1.27 (.17) (-7.62)
\bar{r}^2	.976	.992
<i>D.W.</i>	.907	1.284

Notes: Standard errors are shown in the first parentheses; t-statistics are in the second parentheses; constant terms were estimated but not reported.

specifications and significant. When *G* is excluded from the specification, the Durbin-Watson statistic is very low, indicating positive autocorrelation. Including *G* in the specification increases the statistic to the inconclusive range and improves the goodness of fit. It also confirms the strong negative coefficient on *G* that is present in all other specifications.

The Kormendi specification is repeated for Table 7 but correcting for the possible identity problem posed by the inclusion of *G* in the equation. The identity problem can be reduced by instrumental variable estimation. The instrumental variable used is the lagged value of the government expenditure variable.

The instrumental variable estimates suggest the same conclusion as the OLS estimates. The coefficient of the government expenditure variable is large and highly significant. The coefficient of the debt variable is also large and significantly negative. Thus the tests favor the hypothesis of the new classical theory about the crowding-out effect of government expenditures on consumption.

Table 8 presents the results of estimating the Kormendi specification modified to decompose *G* into *GC* and *GI*, and public debt

Table 7 -- Estimates with Lagged Value for G
(Per Capita)

Y_t	.71 (.19) (3.68)
Y_{t-1}	.19 (.16) (1.24)
T_t	-.43 (.24) (-1.84)
D_t	-.08 (.06) (-1.33)
E_t	.02 (.15) (.16)
G_{t-1}	-1.51 (.15) (-10.39)
r	.994
$D.W.$	1.60

Note: See previous tables.

into ND and XD . Again the lagged values for GC and GI are used. The coefficients of ND and XD are negative and significant. The coefficients on GI and GC are also negative and significant.

Thus one can accept the hypothesis that government expenditures have a crowding-out effect on consumption. There is also some evidence that households may perceive government debt as a future tax obligation that they must save to pay for.

4. Implications

Considering the significant negative coefficients on G characteristic of the consumption functions estimated in the last section, we can conclude that in the Philippines, government expenditures have a crowding-out effect on private consumption. This effect tends to dampen rather than raise output and employment. The behavioral implication is that households seem to be aware that government consumption spending substitutes for the ability to buy consumption goods for themselves.

The implication of these findings for the conduct of fiscal policy deserves some mention at this point. The Keynesian tradition appears to be deeply entrenched in the minds of people in

Table 8 — Estimates with Decomposed G and D (Per Capita)

Y_t	.72 (.20) (3.64)
Y_{t-1}	.23 (.16) (1.43)
T_t	-.68 (.30) (-2.31)
ND_t	-.15 (.07) (-2.29)
XD_t	-.29 (.14) (-2.08)
E_t	-.001 (.17) (.007)
GC_{t-1}	-1.46 (.46) (-3.17)
GI_{t-1}	-1.85 (.35) (-2.99)
r^{-2}	.995
$D.W.$	1.55

Note: See previous tables.

charge of macroeconomic policy (See *Bulletin Today*, 28 November 1985, p.1). The findings here show that increased government spending may not yield the usual multiplier effects in view of the crowding-out of private consumption (on top of the possible crowding-out effects on investment). From the standpoint of substitution, it is not clear that increased government spending should be resorted to as a corrective measure. Government hardly knows the source of timing of economic disturbances.

But why does the government spending substitute for private consumption in the Philippines? When the government spends, its expenditures are financed by regressive taxes or public debt or both.

These ways of financing exert inflationary pressures on the economy. An additional source of inflationary pressures is that government production is far less efficient than private production (Manasan and Buenaventura, 1985). When such inflationary pressures occur, the consumption plans of households go haywire. In the Philippines, in particular, where the majority of the households are poor, inflationary pressures mean that these households must cut down on their consumption expenditures. It is in this sense that we can interpret the negative coefficient on G in the Philippine consumption function.

3. Conclusion

Summary of Results

This study has sought to investigate the macroeconomic effects of government expenditures. Intellectual developments in the analysis of government purchases have shifted the emphasis from the early Keynesian view that government expenditures have a positive and multiplier effect on national income to a new classical view which recognizes the possible crowding-out effect of government expenditures on consumption and investment. Interest in an examination of the pattern of government expenditures has also increased as a result of the recent economic crisis.

The paper tested the implications of the consolidated approach to modeling consumer behavior developed by Martin Bailey and Robert Barro with Philippine aggregate data. The various specifications of the consumption function were characterized by significant and large negative effects of government expenditures on private consumption. Thus we can conclude that in the Philippines government expenditures have a strong crowding-out effect on private consumption. This effect tends to dampen rather than raise output and employment.

Implications for Policy

The empirical investigation of the consumption effects of government expenditures in the Philippines indicates that government expenditures have a strong crowding-out effect on private consumption, which dampens their effect on total output. The implication of these findings for the conduct of fiscal policy is that increased government spending may not yield the usual multiplier effects in view of the crowding-out of private consumption. From

the standpoint of stabilization, it is not clear that increased government spending should be resorted to as a corrective measure to bring about economic recovery. This approach seems to work only in situations where there are no large budgetary deficits and inflationary expectations. The contractions in the Philippine economy of 1984 and 1985 have these twin problems of large deficits and inflationary expectations. Attempts to increase government spending may also exacerbate these problems.

It seems that to effect a recovery and bring the economy to a sustained growth path, basic structural problems must be addressed. There is some evidence that productivity has been declining, for instance, and some enterprises that display low productivity are government-owned. Large amounts of resources have been channeled to government productive activities which have paled in comparison with privately-run enterprises.

REFERENCES

- Bailey, Martin J. (1962, 1971), *National Income and the Price Level*, New York: McGraw-Hill.
- Barro, Robert J. (1974), "The Loan Market, Collateral, and Rates of Interest," Report 7401 (January), Center for Mathematical Studies in Business Economics, University of Chicago.
- Barro, Robert J. (1974a), "Are Government Bonds Net Wealth?" *Journal of Political Economy*, 82 (November/December): 1095-1117.
- Barro, Robert J. (1978), "Public Debt and Taxes," In *Federal Tax Reform: Myths and Realities*, ed. Michael Boskin, San Francisco: Institute of Contemporary Studies.
- Barro, Robert J. (1979), "On the Determination of the Public Debt," *Journal of Political Economy*, 87: 5: 940-971.
- Barro, Robert J. (1981), "Output Effects of Government Purchases," *Journal of Political Economy*, 89 (December): 1086-1121. *Bulletin Today*, 28 November 1985.
- Canlas, Dante B. (1985), "Some Preliminary Evidence on the Aggregate Demand Effects of Fiscal Policy," Paper presented before the Seminar on Economic Development in the Philippines, School of Economics, University of the Philippines, 5-6 December.
- De Dios, Emmanuel (ed.), (1984), *An Analysis of the Philippine Economic Crisis*, Quezon City: U.P. Press.
- Friedman, Milton (1955), *A Theory of the Consumption Function*, New York: National Bureau of Economic Research.
- International Monetary Fund (1981), *Balance of Payments Statistics Yearbook*, Washington.
- International Monetary Fund (1983), *International Financial Statistics*.
- Kormendi, Roger C. (1978), "Government Debt, Government Spending, and Private Sector Behavior," Report No. 7863 (December), Center for Mathematical Studies in Business and Economics, University of Chicago.
- Kormendi, Roger C. (1983), "Government Debt, Government Spending, and Private Sector Behavior," *American Economic Review*, 73 (December): 994-1010.
- Patinkin, Don (1965), *Money, Interest, and Prices* (2nd ed.), New York: Harper and Row.
- Republic of the Philippines, Central Bank (1972, 1983), *Annual Report, Statistical Bulletin*.
- Republic of the Philippines, National Economic and Development Authority, "The 1978 Interindustry Accounts of the Philippines," (Mimeographed.)

Republic of the Philippines, National Economic and Development Authority, *Philippine Statistical Yearbook*. Manila: 1980, 1981, 1982, 1983 and 1984.

Republic of the Philippines, National Economic and Development Authority, *Updated Philippine Development Plan, 1984-1987*.

United States of America, Department of Commerce, Bureau of Census, *World Population, 1977*.

Yamane, Taro (1967), *Statistics (2nd ed.)*, New York: Harper.