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Abstract

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Keywords

Fiji, Government, Economic growth

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THE EFFECT OF GOVERNMENT ON ECONOMIC GROWTH IN FIJI

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ABSTRACT

This paper investigates the empirical relationship between the size of government and the process of economic growth in Fiji. The results reported here present a mixed picture, in that the model estimated specifies two different effects of the government sector on economic growth. Using annual time series data for the period 1964-1999, it is found that government expenditure exerts a strong beneficial impact on economic growth. However, marginal factor productivity in the government sector is found to be lower than that of the private sector. The reasons for this low productivity are twofold: the result of the lack of market incentives and signals in the public sector and the involvement of Fiji's government in some activities which may be rationalised in terms of the socio-political objectives of the Fijian government. While recognising that there may be factors which may hinder the process of efficiency in the private sector, it can be argued that by shifting factors of production from the low productivity (government) sector to the high productivity (private) sector, the rate of growth of GNP will increase.

I. INTRODUCTION

The purpose of this paper is to determine the effect of government on the economic growth rate of the Fijian economy. Such studies are usually conducted on high-income, OECD-type countries, not "small", "middle income", island economies such as Fiji. Countries like Fiji are somewhat neglected in terms of economic analysis. The effect of government on economic growth is a very important issue in contemporary economic and political debate. One view is that government wastes scarce economic resources, and thus can be characterised as a "leaky bucket" (Okun, 1975: 91). An alternative view is that government activity stimulates economic growth.

Although this issue is fundamentally important there are relatively few empirical studies that can shed some light on the effect of government on economic growth. Landau (1983, 1986), Gemmell (1983) and Ram (1986) are some of the studies that can be quoted in this context. Afxentiou (1982) provides a summary of early studies that are related to this issue. More recently, as a by-product of the endogenous growth literature associated with Romer (1986) and Lucas (1988), there has been a resurgence of empirical work. The flavour of the "new" empirical studies can be discerned from, *inter alia*, Castles and Dowrick (1990), Dowrick (1993), Barro (1991) and Barro and Sala-i-Martin (1995) and the literature cited therein.

The existing empirical literature is characterised by conflicting results. For example, Landau (1983) found that government size depressed economic growth. His later work reached the same conclusion: "government consumption expenditure excluding military and educational expenditure appears to have noticeably reduced economic growth" (Landau, 1986: 68). A similar conclusion is reached by Barro and Sala-i-Martin (1995: 434).

On the other hand, Ram (1986) concludes that "government size has a positive effect on economic performance and growth [and there is a] pervasive indication of a positive externality effect of government size on the rest of the economy" (Ram, 1986: 202). Similarly Castles and Dowrick conclude "we reject the hypothesis that government expenditures reduce economic growth and indicate some areas of social expenditure which may possibly tend to increase growth" (Castles and Dowrick, 1990: 173).

The reasons for these conflicting results may be associated with various factors. These studies are characterised by differences in model formulation, the use of time series and cross-section data, different time periods analysed, differences in the countries included in (cross-section) samples, and differences in data sets employed. It is not surprising that the literature is characterised by differing conclusions.

These points can be illustrated by a brief comparison of the work of Aschauer (1989) and Castles and Dowrick (1990). See also Otto and Voss (1994). Aschauer (1989) is concerned with determining the effect on the private economy of both government **flow** variables (current expenditures of various types) as well as **stocks** of government capital. Generally, Aschauer finds that, using time series data for the United States, public sector capital accumulation (particularly "core" infrastructure such as streets, highways, airports, mass transit systems, sewers and water systems) is more important in determining private sector growth than are flow variables associated with current government expenditures.

On the other hand, Castles and Dowrick (1990) analyse data for the OECD countries, sometimes including and sometimes excluding Japan as an outlier, for five (averaged) periods 1960-1967, 1968-1973, 1974-1979, and 1980-1985. Essentially, this is a cross sectional study. In contrast to Aschauer, this study is concerned with GNP growth (not just the growth of the private sector) and the government sector is analysed in terms

of consumption expenditure, non-consumption expenditure, social expenditure and non-social expenditure. Two of their conclusions are worth quoting: "the evidence presented here is such as to rule virtually out of court any interpretation that argues for a statistically significant negative relationship between the level of government revenues and the components of government expenditure and medium-term economic growth...[and]...there is a modest, but statistically significant, positive effect of non-consumption expenditure, and especially social transfers, on medium-term growth of productivity" (Castles and Dowrick, 1990: 200-1).

The purpose of this paper is to state a two-sector model of economic growth, following Ram (1986), and estimate this model for a single country (Fiji) using time series data. Fiji is a small (with a population of 801,000 in 1999) island economy, classified by the World Bank as a lower middle income country. The structure of the paper is as follows. Section II presents a brief account of the theoretical framework of the model employed in this analysis. Section III addresses four fundamentally important issues of estimation, *viz.* time series *vs* cross-sectional data, the importance of a dummy variable in the regression analysis, and the time series properties of the data. Section IV presents the empirical regression results for the gross national product (GNP) growth equation, as well as policy implications of the study. Section V provides some concluding remarks.

II. THE THEORETICAL FRAMEWORK

In order to measure the relationship between government size and economic growth, a two-sector production function approach is employed. This two-sector production function concept was first used by Robinson (1971) in terms of dualistic developing economies which were characterised as consisting of "traditional" and

"modern" sectors. Subsequently Feder (1982) applied this two-sector model of growth to address the issue of determining the effect on economic growth of an export sector. Some years later Ram (1986) applied the two-sector growth model, not to a disaggregation of the economy into "traditional" and "modern" sectors, or domestic and export sectors, but to a disaggregation into the private sector and the public sector. It is important to recognise that this theoretical framework addresses two important issues in public finance: the inter-sectoral factor productivity difference between the private and government sectors and the marginal externality effect of government output on the private sector.

Following Ram (1986), it is assumed that the economy is divided into two major sectors, the government sector (G) and the private sector (P). In this two-sector model the following production functions are postulated:

$$P = P(L_p, K_p, G) \tag{1}$$

$$G = G(L_g, K_g) \tag{2}$$

where L is labour input,
       K is capital input and,
       subscripts p and g denote sectoral inputs.

The total inputs can then be specified as follows:

$$L_p + L_g = L \tag{3}$$

$$K_p + K_g = K \tag{4}$$

It is clear that the total output (Y) is the sum of outputs (P and G) in the two sectors and thus

$$Y = P + G \quad \Rightarrow \quad \dot{Y} = \dot{P}(P/Y) + \dot{G}(G/Y) \tag{5}$$

where a dot over each variable denotes its rate of growth.

Assuming that the relative factor productivity in the private and government sectors varies,

the following relation can be specified:

$$\frac{G_L}{P_L} = \frac{G_K}{P_K} = (1 + \delta)$$ (6)

where G_L= is the marginal product of labour in the government sector or $\partial G/\partial L$,
P_L= the marginal product of labour in the private sector or $\partial P/\partial L$,
G_K= the marginal product of capital in the government sector or $\partial G/\partial K$, and
P_K= the marginal product of capital in the private sector or $\partial P/\partial K$.

Using the sectoral production functions and relations (3) to (6), after some algebraic manipulations Ram (1986) arrives at the following approximation for an aggregate growth equation:

$$\dot{Y} = \beta_1 \frac{I}{Y} + \beta_2 \dot{L} + [\frac{\delta}{(1+\delta)} - \theta]\dot{G}(\frac{G}{Y}) + \theta\dot{G}$$ (7)

where   a dot over each variable denotes its rate of growth, and
I is total investment or $\triangle K$.
Note that since the marginal productivities are not equalised across sectors, and there are some inter-sectoral externalities, the estimated coefficient for $\dot{G}(G/Y)$ should be statistically different from zero.

The meaning of δ and θ in Equation (7) merits detailed attention as there are two policy implications which can be obtained from these estimated coefficients. First, δ indicates the inter-sectoral factor productivity difference. If δ is positive, this implies that the government sector has a higher marginal factor productivity than does the private sector, and *vice versa*. Second, θ, which is $(\partial P/\partial G).(G/P)$, indicates the elasticity of private output with respect to G. In other words, θ is the marginal externality effect of government output on economic growth in that, if $\theta>0$, it indicates that the government sector provides a positive externality on economic growth, and *vice versa*. Therefore, Equation (7) specifies two different mechanisms by which the government sector affects economic growth, *i.e.* the externality effect of government size that is not captured by the

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price mechanism and the differences in the productivity of factors of production employed in the two sectors.

In this study it is expected that productivity in the government sector will be lower than that in the private sector. Thus the expected sign for δ is negative. This is because a large proportion of government expenditure relates to activities which are subject to X-inefficiency, in the sense of Liebenstein (1966), or are subject to the forces suggested by Niskanen (1971) in his analysis of bureaucratic behaviour.

Attention is now directed to the coefficient θ in Equation (7). It is hypothesised that the government sector, by and large, provides some positive externalities associated with economic and social infrastructure such as roads, dams, education, health etc. Thus the size of the government sector is expected to have a positive impact on economic growth. This means that it is our expectation that $\theta > 0$ in Equation (7).

III. ISSUES OF ESTIMATION

Before proceeding to undertake estimation of various equations, there are four issues that need to be addressed. The first issue relates to the nature of data that are used to estimate the relationship between the variables. The second issue is associated with the use of an intercept dummy variable in the estimation period. The third issue relates to the time series properties of the data, and the fourth is concerned with a possible measurement error.

The existing literature on the nexus between government and economic growth is dominated by the use of cross-country data. This dominant procedure has been to estimate equations such as Equation (7), using data from different countries at much the same point of time. In fact there is only one study by Ram (1986) which has undertaken analyses of

individual countries employing time series data.

A little reflection on the relationship between government and growth indicates that the relationship can be appropriately analysed for individual countries over time. In fact it could be argued that this is **the** appropriate way to proceed. The limitations of using cross-section data on various samples of countries have been highlighted in some papers. For instance, Feder (1982) points out that the interpretation of his econometric results must be carefully considered given his use of cross-section data. He writes "any cross-country study assumes implicitly that parameters are in some general way similar across countries...It is probably best to treat the estimated coefficients as average values which provide a general order of magnitude within the sample but are not applicable to any specific country" (Feder, 1982: 64). Writing on the same issue Ram (1987) begins by pointing out that there are large differences between countries and that "imposition of a common structure in the form of cross-section models can be a drastic simplification, and important parametric differences could be masked in cross-section estimates even when the samples chosen look fairly homogeneous with reference to certain prior criteria" (Ram, 1987: 52). For Ram, the final conclusion is that the models of the "export-growth nexus" should be tested on time series data for individual countries rather than cross-country data. It must be recognised that econometric procedures applied to such cross-sectional data indicate nothing about time series phenomena except under very special circumstances (Kuh, 1959). See also Pesaran and smith (1995). The use of cross-section data essentially assumes that the maintained, but untested, hypothesis that cross-section differences for numerous countries approximate time series differences for a single country, holds.

This discussion leads to the inexorable conclusion that the numerous empirical studies on various economic issues, if based on the analysis of cross-section data, are

fundamentally flawed. Put otherwise, such studies provide policy makers with no insight into the issues with which they have to grapple, given the specific institutional and structural peculiarities of their individual countries. See Saith (1983) for a relevant discussion of this issue. More specifically the analysis of these economic issues, including that of government and economic growth, requires time series data for individual countries.

However, it should be pointed out that the use of cross-section data has also useful applications. For example, traditional measures of human capital, and to some extent the role of government in an economy evolve very sluggishly through time, hence there would be inadequate variation in the data to enable the effects to emanate. However, the use of cross-section data will enable us to measure these differences among various countries.

The second important estimation issue involves the use of an intercept dummy variable in our analysis. Table 1 presents summary statistics of the data employed in this study. What is notable about these data is the extent of variability during the period analysed here, 1964-1999: the Fijian economy has been subjected to several shocks and regime shifts. The most important are the 1987 military *coups d' état*. The literature on the Fijian *coups* of 1987 is somewhat unique in that there is also an account from the leader of those *coups*, Rambuka (Dean and Ritova, 1988). Subsequent political and constitutional events are discussed in the papers in Lal and Larmour (1997).

According to Table 1, GNP growth varied from a minimum of negative 8.2 per cent to an unprecedented value of 13.2 per cent, in the period 1964-1999. The major source of this "volatility" relates to socio-economic factors which are beyond the scope of this paper. It is expected that the political instability that followed the two *coups* of 1987

would have an adverse effect on the level of GNP. An inspection of the time series data on GNP indicates that GNP for the year 1987 was significantly lower than indicated from the long-run path. Fitting a linear time trend to GNP for Fiji required the insertion of a dummy variable for 1987 to capture the effect of this political instability. This dummy variable takes the value of unity for the year 1987 and zero otherwise.

[TABLE 1 ABOUT HERE]

The third important issue is the necessity of determining the time series properties of the data. This is because the problem of spurious regression could arise in applying multiple regression analysis. See Rao (1994) and the literature cited therein. Table 2 presents the result of applying the Augmented Dickey-Fuller (ADF) test to the data for this analysis. On the basis of these results, there is convincing evidence for the view that the data employed in this analysis are all stationary, *i.e. I*(0).

It is recognised that national accounting procedures for the public sector involve the value of public outputs being determined by the costs of the inputs used in the production of those outputs. This convention has the implication that productivity changes in the public sector may not be captured in published data. This leads to the conclusion that the results reported here may underestimate the productivity in the public sector. Thus differences between the private sector and the public sector may reflect this national accounting procedure rather than X-inefficiency in the public sector.

[TABLE 2 ABOUT HERE]

IV. EMPIRICAL RESULTS

All the data employed in this study have been extracted from the 2001 World Development Indicators CD-ROM published by World Bank (2001). The financial data are in constant (1989) prices. The measure of government that is employed in the

empirical analysis is that of current or consumption expenditure. In common with similar studies, government investment is aggregated with private sector investment. Moreover no data on the stock of government capital, as analysed by Aschauer (1989) and Otto and Voss (1994), are available. Put otherwise this study is restricted to a flow measure of the government sector. Furthermore data on transfers, predominantly of a social kind, as analysed by Castles and Dowrick (1990), are also not available. It should also be noted that the data on government current expenditure have been converted into constant prices, not by the application of the GNP deflator, but by the use of a specific government price deflator. What this means is that the size of the government sector is determined by reference to relative prices not nominal prices, a point emphasised by Beck (1979, 1985).

Table 3 presents the regression results of three equations estimated to explain Fiji's economic growth in the period 1964-1999. Equation (I) provides the empirical results from an estimation of Equation (7). This estimated equation indicates that labour force growth and particularly I/Y are not statistically significant. All the other variables relating to $\dot{G}(G/Y)$ and $\dot{G}$ are significant at least at the 10 per cent level. In addition, this equation passes all the reported diagnostic tests in Table 3. However, the stochastic residual in 1987 for this equation is found to be abnormally high, and as discussed earlier, an intercept dummy variable is introduced to capture this outlier observation. It is important to note that in May and October 1987 there were two military coups led by Lieutenant-Colonel Sitiveni Rambuka. This impulse dummy variable captures the effect of these events on an equation for economic growth in Fiji. Once this dummy variable, which takes the value of unity in 1987 and zero otherwise , is added to Equation (I), Equation (II) is obtained.

Since I/Y is not significant and has the wrong expected sign, this variable is

excluded from Equation (II) to obtain Equation (III). In other words, in Equation (III) all the explanatory variables of Equation (II) are retained, the only exception being I/Y.

[TABLE 3 ABOUT HERE]

As with Equations (I) and (II), Equation (III) uses the stationary time series data and also performs well in terms of goodness-of-fit statistics. It should be noted that an adjusted R^2 of 0.405 for the GNP growth equation is quite acceptable. Given that the data for this study are growth rates, calculated from data in levels, one expects that the "volatility" associated with differences will have the effect of not producing goodness-of-fit statistics as high as an equation estimated in levels. Similar to Equations (I) and (II), this equation also passes a battery of econometric diagnostic tests. Thus there is reason to have confidence in the estimated coefficients. See Table 3.

From the estimated Equation (III) one can derive the estimated coefficients of δ and θ. Given that $\theta=1.06$ (the estimated coefficient on the growth rate of current government expenditure) and

$$[\delta/(1+\delta)-\theta] = -6.13$$

the estimated δ is -0.84. The estimated coefficient for θ in Equation (III), which is our preferred equation with the highest adjusted R^2, indicates that if government expenditure is increased by 1 per cent without withdrawing resources from the private sector, the latter grows by approximately 1.06 per cent. Therefore, it can be argued that, by and large, the impact of government expenditure (size) on economic growth, via externalities on the private sector, is positive. However, since δ equals -0.84, marginal factor productivity in the government sector is lower than that of the private sector. These empirical results are not counter-intuitive as the government sector in Fiji is involved in some activities which are not economically efficacious, but find their justification in terms of the social/political

objectives of the power elite that wields political control. Put otherwise, the behaviour of the public sector in Fiji is compatible with X-inefficiency in the sense of Leibenstein (1966) or the bureaucratic forces first articulated by Niskanen (1971). In other words, the differences result from the failure of government administrators to equate marginal factor productivities between the government and private sectors, and the positive externalities emanating from the public sector. However, on an overall basis, the government size has had a positive role in accelerating economic growth.

One may argue that due to the possible simultaneity problem between $\dot{Y}_t$ and $\dot{G}_t$, the OLS estimators for this equation (the last column of Table 3) are inconsistent. We have conducted the Hausman (1978) test to see if $\dot{G}_t$ is weakly exogenous with respect to $\dot{Y}_t$. Thus, we have estimated a conditional model and a marginal model. The conditional model is the initial regression for $\dot{Y}_t$ reported in the last column of Table 3 and the marginal model for $\dot{G}_t$ is assumed to be a function of a number of conditioning variables, *i.e.* the lagged values of $\dot{G}_t$ and $\dot{Y}_t$, where they are significant. Given that the resulting residual from the marginal model with a t-ratio of –0.78 was not significant in the conditional model, we have concluded that $\dot{G}_t$ is weakly exogenous with respect to $\dot{Y}_t$ and hence the OLS estimators are both consistent and efficient. The regression results for the marginal model are not reported here but are available upon request from the authors.

The above discussion does not imply that the growth of the economy does not affect the role of government. It is plausible to hypothesise that higher economic growth enables the government to play a stronger role, *e.g.* by improving tax efficiency and collecting more revenue. In order to investigate this nexus between economic growth and the growth of government expenditure in Fiji, we have also undertaken the Granger (1969)

causality test and the results of this test are shown in Table 4. As seen from this Table there is a clear bi-directional causality between GNP growth and the growth of government expenditure, and these statistical inferences are not subject to reversal using different lags.

As we have rejected the null of "$\dot{G_t}$ does not Granger cause $\dot{Y_t}$", it is concluded that $\dot{G_t}$ is not strongly exogenous with respect to $\dot{Y_t}$. It should be noted that $\dot{G_t}$ would be strongly exogenous with respect to $\dot{Y_t}$ if a) $\dot{G_t}$ was weakly exogenous with respect to $\dot{Y_t}$, and b) $\dot{Y_t}$ was not caused by $\dot{G_t}$ in the sense of Granger."

[TABLE 4 ABOUT HERE}

V. CONCLUDING REMARKS

The impact of the government sector on economic growth has been discussed by many economists using cross-country data. However, there is no consensus in the literature as empirical analyses lead to contradictory conclusions as to the effect of the public sector on economic growth. The various conclusions may be associated with the fact that different models have been estimated, and complications which arise from the predominant use of cross-section data for various countries with completely diverse institutional and structural peculiarities. This paper adapts Ram's two-sector model to analyse the impact of the government sector on economic growth in Fiji by using time series data for the period 1964-1999. There are two major policy implications of this paper. First, it is found that government consumption expenditure exerts a strong beneficial externality on economic growth in the private sector. Second, it is found that marginal factor productivity in the public sector is lower than that of the private sector. In other words, the empirical results indicate that there are inefficiencies within the

government sector. By shifting factors of production from the public sector, with low productivity, to the private sector, with high productivity, the rate of growth of GNP will rise. However, one should distinguish between the "growth effect" and the "level effect" of government expenditure. Given that this study is concerned with estimation of a growth equation, the results reported here indicate nothing about the "level effect" of government spending.

Before concluding two points should be noted. First, it should be recognised that this analysis does not provide answers to all questions that can be asked about the relationship between the government sector and economic growth. The component of government activity that has been analysed here is only current or consumption expenditure: other dimensions of government, *e.g.* the public stock of capital and redistributive transfers, have not been considered. Second, a simple comparison of the results of this study with those of other studies, *e.g.* Castles and Dowrick (1990) and Barro and Sala-i-Martin (1995), is not possible. This non-comparability stems from several sources, *e.g.* use of different data and different model specifications. In this context it is relevant to note that the model analysed here separates the effect of government into two components, *viz.* an externality effect of government size on the private sector and different productivities associated with the employment of factors of production in both the public and private sectors. This disaggregation, although quite important, precludes a comparison with other studies which do not provide for these separate effects.

TABLE 1
DESCRIPTIONS OF THE DATA AND SUMMARY STATISTICS, FIJI, 1964-1999

Variable	Mean	Standard deviation	Minimum	Maximum
GNP growth: $\dot{Y}_t$	0.035	0.058	-0.082	0.132
Total investment/GNP: I_t/Y_t	0.173	0.044	0.097	0.266
Labour force growth: $\dot{L}_t$	0.027	0.006	0.003	0.039
Government consumption growth: $\dot{G}_t$	0.040	0.114	-0.352	0.225
$\dot{G}_t(G_t/Y_t)$	0.007	0.018	-0.043	0.037

Notes: (1) All financial data are in constant prices; (2) Growth rate of a variable, say Y_t, is calculated as $\dot{Y}_t = \log(Y_t) - \log(Y_{t-1})$.

Source: The 2001 World Development Indicators CD-ROM, The World Bank, Washington DC.

TABLE 2
TIME SERIES PROPERTIES OF THE DATA EMPLOYED, FIJI, 1964-1999

Variable	ADF t statistics	Order of integration
$\dot{Y}_t$	-6.21*	$I(0)$
I_t/Y_t	-4.40**	$I(0)$
$\dot{L}_t$	-3.71**	$I(0)$♣
$\dot{G}_t(G_t/Y_t)$	-5.13*	$I(0)$
$\dot{G}_t$	-5.31*	$I(0)$

Notes: (1) * indicates the null hypothesis is rejected at the 1% level of significance; (2) ** indicates the null hypothesis is rejected at the 5% level of significance; (3) ♣ indicates that an intercept dummy variable has been used in the ADF regression for $\Delta\log(L_t)$. This dummy variable equals unity in 1980 and 1981 and zero otherwise; (4) The Schwarz criterion has been employed to determine the optimal lag length in the ADF regression.

TABLE 3

REGRESSION EQUATIONS EXPLAINING ECONOMIC GROWTH ($\dot{Y}_t$),
1964-1999

Explanatory variables	Equation (I)	Equation (II)	Equation (III)
I_t / Y_t	-0.09 (-0.50)	-0.06 (-0.32)	-
$\dot{L}_t$	1.84 (1.54)	1.73 (1.50)	1.38^{*} (3.92)
$\dot{G}_t (G_t / Y_t)$	-5.71^{**} (-1.96)	-6.27^{*} (-2.21)	-6.13^{*} (-2.21)
$\dot{G}_t$	1.02^{*} (2.25)	1.08^{*} (2.46)	1.06^{*} (2.48)
Dum	-	-0.097^{**} (-1.80)	-0.099^{**} (-1.88)
R^2	0.419	0.474	0.473
Adj R^2	0.344	0.390	0.405
Diagnostic Tests			
DW	2.38	2.26	2.26
AR 1- 2	$F(2, 30)=1.13$	$F(2, 29)=0.64$	$F(2, 30)=0.67$
ARCH 1	$F(1, 30)=0.004$	$F(1, 29)=0.02$	$F(1, 30)=0.02$
Normality Chi^2(2)	0.41	0.09	0.20
White: Xi^2	$F(8, 23)=0.33$	$F(9, 21)=0.29$	$F(7, 24)=0.23$
White: Xi*Xj	$F(14, 17)=0.52$	$F(15, 15)=0.43$	$F(10, 21)=0.34$
RESET	$F(1, 31)=0.74$	$F(1, 30)=0.21$	$F(1, 31)=0.15$
Order of integration of residuals	$I(0)$	$I(0)$	$I(0)$

Notes: * and ** indicate that the relevant null hypotheses are rejected at the 5 and 10 per cent levels of significance, respectively.

TABLE 4

GRANGER CAUSALITY TEST RESULTS

Null hypothesis	F statistics	Probability
$\dot{Y}_t$ does not Granger cause $\dot{G}_t$:		
1 lag	0.00	0.95
2 lags	0.13	0.88
$\dot{G}_t$ does not Granger cause $\dot{Y}_t$:		
1 lag	1.24	0.27
2 lags	0.79	0.46

REFERENCES

Afxentiou, P.C., (1982), "Economic Development and the Public Sector: An Evaluation," *Atlantic Economic Journal*, X(4), pp. 32-8.

Aschauer, D. A., (1989), "Is Public Expenditure Productive?," *Journal of Monetary Economics,* 23, pp.177-200.

Barro, R.J., (1991), "Economic Growth in a Cross-Section of Countries," *The Quarterly Journal of Economics*, 106, pp. 407-43.

Barro, R.J. and Sala-i-Martin, X., (1995), *Economic Growth*, New York: McGraw-Hill.

Beck, M., (1979), "Public Sector Growth: A Real Perspective," *Public Finance/Finances Publique*, XXXIV, pp. 313-56.

Beck, M., (1985), "Public Expenditure, Relative Prices, and Resource Allocation," *Public Finance/Finances Publique*, XXXX, pp. 17-34.

Castles, F. G. and Dowrick, S., (1990), "The Impact of Government Spending Levels on Medium Term Economic Growth in the OECD, 1960-1985," *Journal of Theoretical Politics*, 2(2), pp.173-204.

Dean, E. and Ritova, S., (1988), *Ranbuka: No Other Way-His Own Story of the Fijian Coup*, Sydney: Doubleday.

Dowrick, S., (1993), "Government Consumption: Its Effects on Productivity Growth and Investment," in N. Gemmell, ed., *The growth of the public sector: Theories and international evidence*, Aldershot: Edward Elgar, pp.136-52.

Feder, G., (1982), "On Exports and Economic Growth," *Journal of Development Economics*, 12(1), pp. 59-73.

Gemmell, N., (1983), "International Comparisons of the Effects of Nonmarket-Sector Growth," *Journal of Comparative Economics*, 7, pp. 368-81.

Granger, C.W.J. (1969), "Investigating Causal Relations by Econometric Models and Cross-Spectral Methods", Econometrica, 37, pp.424-38.

Hausman, J. A. (1978), "Specification Tests in Econometrics", *Econometrica*, 46, pp.1251-72.

Kuh, E., (1959), "The Validity of Cross-Sectionally Estimated Behaviour Equations in Time Series Applications," *Econometrica*, 27(2), pp. 197-214.

Lal, B.V. and Larmour, P., (1997) (eds.), *Electoral Systems in Divided Societies: The Fiji Constitution Review*, Pacific Policy Paper 21, National Centre for Development Studies, Canberra.

Landau, D., (1983), "Government Expenditure and Economic Growth: A Cross-Country Study," *Southern Economic Journal*, 49(3), pp. 783-92.

Landau, D., (1986), "Government and Economic Growth in the Less Developed Countries: an Empirical Study for 1960-1980," *Economic Development and Cultural Change*, 35(1), pp. 35-75.

Liebenstein, H., (1966), "Allocative Efficiency *vs* X-Efficiency," *American Economic Review*, LVI(3), pp. 392-415.

Lucas, R. E., (1988), "On the Mechanics of Economic Development," *Journal of Monetary Economics*, 22(1), pp. 3-42.

Niskanen, W. A., (1971), *Bureaucracy and Representative Government*, Chicago: Aldine.

Okun, A. M., (1975), *Equality and Efficiency: The Big Tradeoff*, Washington, DC: The Brookings Institution.

Otto, G. and Voss, G. M., (1994), "Public Capital and Private Sector Productivity," *The Economic Record*, 10(209), pp. 121-32.

Pesaran, M. H. and Smith, R. (1995), "*Estimating Long-run relationships from Dynamic Heterogeneous Panels*", *Journal of Econometrics*, 68(1), pp. 79-113.

Ram, R., (1986), "Government Size and Economic Growth: A New Framework and Some Evidence from Cross-Section and Time Series Data," *American Economic Review*, 76(1), pp. 191-203.

Ram, R., (1987), "Exports and Economic Growth in Developing Countries: Evidence from Time-Series and Cross-Section Data," *Economic Development and Cultural Change*, 36(1), pp. 51-72.

Rao, B. B., (1994), ed., *Cointegration for the Applied Economist*, London: Macmillan.

Robinson, S., (1971), "Sources of Growth in Less Developed Countries: A Cross-Section Study," *The Quarterly Journal of Economics*, LXXXV(3), pp. 391-408.

Romer, P. M., (1986), "Increasing Returns and Long-Run Growth," *Journal of Political Economy*, 94(5), pp.1002-37.

World Bank (2001), *World Development Indicators CD-ROM,* Washington DC.