The Demand for Current Public Expenditure in Fiji: Theory and Empirical Results

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Abstract

This paper analyses current government expenditure in Fiji using annual time series data for the period 1969-1999. Alternative theories of government expenditure are reviewed and a distinction is made between economic/apolitical determinants and institutional/political determinants. Categorising the literature in this way suggests the application of non-nested tests in empirical work, which is reported elsewhere. All non-nested tests lead to the conclusion of double rejection. Therefore, a parsimonious comprehensive model, encompassing both economic and institutional variables, is preferred as it passes all diagnostic tests and exhibits no sign of misspecification. The Engle-Granger two-step procedure has been applied to analyse both long- and short-run determinants of public expenditure. The paper presents the first empirical estimates of the own-price elasticity of demand and income elasticity of demand for current public expenditure in Fiji.

Introduction

Fiji became independent in 1970 with Ratu Sir Kamisese Mara as Prime Minister after nearly a century as a British colony. Fiji had a population of 801000 in 1999 and has been classified as a lower middle income country by the World Bank, with a per capita annual income of US$2310 (World Bank, 2001). Although it is one of the most developed of the Pacific island economies, it still has a large subsistence sector and the economy can be regarded as dualistic. Sugar and clothing are the main (commodity) export industries. Political uncertainties have created economic uncertainties. *Coups* in 1987 and more recently in May

[*] We wish to acknowledge the helpful comments of two anonymous referees. The usual caveat applies.

2000 have created an economic environment which is not conducive to long-term investment as a result of poorly-defined property rights and migration of skilled workers (Gani, 1998). For an account of recent economic events see Chand (1998) and for political and constitutional events see Lal and Lamour (1997).

Given this turbulent recent history concerning governance it is relevant to apply contemporary public finance theories on the determinants of the size of the government sector. The objective of this paper is to do just that.

Since the pioneering studies by Borcherding and Deacon (1972) and Bergstrom and Goodman (1973) the analysis of the size of the government sector has ceased to be characterised by the atheoretical or *ad hoc* analyses that were dominant until then. For bibliographies of the early literature see Pryor (1968: 46-51) and Borcherding (1977: 67-70). Essentially the modern analysis of the demand for goods and services provided by government involves an application of the median voter hypothesis, associated with Downs (1957). This conception will be referred to below as 'the economic/apolitical model'.

In essence the demand for public goods is conceived of as the outcome of the demand for public goods by the median voter, or as Borcherding (1985) puts it, by "the Fiscal Everyman". Put otherwise, the demand for government expenditure is to be seen as a function of the characteristics of the median voter. This conceptual framework leads to a relatively parsimonious specification of the explanatory variables in the demand equation. Those factors are as follows: prices, income and population, as well as some other relevant variables. For an exposition see, *inter alia*, Larkey, Stolp and Winer (1981), Mueller (1989) and Brown and Jackson (1986).

This conceptual framework is, by no means, the only theory of government expenditure. For instance, Wagner (1883) had argued that the public sector expands as the structure of the economy changes and as income rises through time; Peacock and Wiseman

(1967) have argued that government expenditure is subject to a “displacement effect” associated with some crisis such as war; and Nordhaus (1975) has argued that government expenditure (and other macroeconomic variables) are subject to “political business cycles”. It is not our purpose here to enumerate these numerous theories and/or create a new classification scheme. See for example Lybeck (1986) for a 12-fold classification of such theories, Henrekson (1988) for a categorisation of demand and supply side determinants and Mueller (1989: 320-47) for a five-fold classification scheme.

The approach adopted in this paper is to categorise explanatory variables of government expenditure as being of an economic/apolitical kind or of an institutional/political nature. This dual scheme has been employed by Borcherding (1985) and Halsey and Borcherding (1997). Such a formulation suggests a means by which an indication of the relative importance of these two models can be established. Viewing explanatory variables in this way invites the application of non-nested econometric tests.

A second important approach to explain government expenditure is what is referred to below as “the institutional model”. This approach covers a wide range of issues such as the political business cycle (Rogoff, 1990), political unrest/revolt (such as the coups of 1987-1988 and 2000), macroeconomic variables such as unemployment and inflation, the power of pressure groups (Tullock, 1959, Stigler, 1970, Olson, 1982, Mueller and Murrell, 1986, and Marlow and Orzechowski, 1996), fiscal illusion (Buchanan, 1967), and incrementalism (Wildavsky, 1964). Also, it should be recognised that exogenous shocks, such as the oil embargo of 1973 and 1974, can have important repercussions on government expenditure.

The structure of this paper is as follows: The next section presents a theoretical framework for the analysis. The following section provides a brief account of the structure of the government sector in Fiji and some relevant time series data on the phenomena to be explained. The penultimate section discusses the time series properties of the data and econometric results of the Engle-Granger two-step procedure. Some concluding remarks will be presented in the final section.

Theoretical framework and estimation procedure

It is not our purpose here to provide a comprehensive review and evaluation of the theoretical and empirical literature on the demand for public goods: such a review is provided recently in Doessel and Valadkhani (2002). We provide here only a brief outline of the framework of the estimating procedure we have adopted.

The economic/structural model

Following Gemmell (1990), the demand for real government expenditure can be stated as follows:

$$G_t \;=\; A\, P_{gt}^{\beta_1}\; P_{yt}^{\beta_2}\; \left(Y_t \;/\; POP_t\right)^{\beta_3}\; POP_t^{\beta_4} \qquad (1)$$

where G_t is real government consumption expenditure,

A is a constant,

P_{gt} is the price of government-provided goods and services, as measured by the government price deflator,

P_{yt} is the price of private goods and services as measured by the GDP deflator,

Y_t is real GDP,

POP_t is population, and

β_1, β_2, β_3 and β_4 are elasticities to be estimated.

This equation bears a close resemblance to the formulations in Borcherding and Deacon (1972) and Bergstrom and Goodman (1973). For details see Gemmell (1990). Our actual estimating equation is as follows:

$$\ln(G_t) = \beta_0 + \beta_1 \ln(P_{gt} / P_{yt}) + \beta_2 \ln(Y_t / POP_t) + \beta_3 \ln(POP_t) + \beta_4 \ln(AGEMR_t) + \beta_5 DV(coup)_t + \varepsilon_{1t} \quad (2)$$

where AGEMR is the ratio of agricultural employment to total employment, DV(Coup) is an intercept dummy variable which takes the value of 1 for the coups of the 1987-1988 period, and zero otherwise, and ε_1 *is* a well-behaved error term.

A brief explanation for the inclusion of these explanatory variables was in the previous section.

The institutional model

An important advance in the study of the public sector occurred in the 1950s, when some economists applied the tools of their trade to non-market decision making, *i.e.* economic theory was applied to issues which had previously been in the domain of political science. This development, initiated by, *inter alia*, Black (1948), Downs (1957), and Buchanan and Tullock (1962), is now generally referred to as "public choice". See Mueller (1989) for a comprehensive account of this approach.

An important conclusion from the public choice school is that the outcomes of the public sector are determined, in part, by institutions, their procedures and the people working in those institutions. In other words, fiscal institutions can determine outcomes. This seemingly trite point, *i.e.* that institutions matter, is central to the public choice literature. As Buchanan and Wagner (1977: 636) put it "We are institutionalists in the sense that we think that arrangements or rules do affect outcomes."

The institutional model we are estimating can be specified as follows:

$$\ln(G_t) = \alpha_0 + \alpha_1 EDV_t + \alpha_2 \ln(U_t) + \alpha_3 \ln(SEREMR_t) + \alpha_4 \ln(OPEN_t) + \alpha_5 \ln(HHIT_t) + \alpha_6 \ln(DTAXR_t) + \alpha_7 \Delta \ln(P_{yt}) + \alpha_8 DV(coup) + \varepsilon_{2t} \quad (3)$$

where EDV is an intercept dummy variable which equals unity when there has been an election, and zero otherwise, SEREMR is the ratio of service employment to total employment,

OPEN is an index of openness as defined by total exports and imports divided by GDP,

U is the rate of unemployment,

HHIT is the Hirschman-Herfindahl index (Hirschman, 1964) of tax complexity,

DTAXR is the ratio of direct taxes to total taxes, and

Δln(Py) is the inflation rate using the GDP price deflator.

A rationale for these explanatory variables was considered briefly in the introductory section. For a more detailed account of the literature on the theoretical underpinning of these explanatory variables see Doessel and Valadkhani (2002). Table 1 summarises both the notation to be employed in this study and the expected theoretical signs of the relevant explanatory coefficients in both the economic/structural model and the institutional model.

[Table 1 about here]

Estimation procedure

The empirical procedure has been to estimate equation (2) and equation (3) separately. These two equations performed quiet well in terms of goodness-of-fit, most of the coefficients being statistically significant (at the 5 per cent level), and having the expected theoretical signs. However, there were some diagnostic tests which indicated misspecification in the institutional model and serious autocorrelation in the economic model. Furthermore, the application of non-nested tests [the Cox test, the Ericsson Instrumental Variable (IV) test, the Sargan restricted/unrestricted reduced form test, and the encompassing (*F*) test, Hendry and Doornik (1999)], to these separate models explaining government expenditure, indicate rejection of each model. Essentially these results signify that an explanation of government expenditure in Fiji cannot be found in either a solely institutional/political model or a pure economic/apolitical model. These non-nested test results and estimated equations (2) and (3), not reported here, have been published elsewhere (Doessel and Valadkhani, 2002). Therefore, attention is now directed to the specification and estimation of a comprehensive model including all the variables in both models. We have applied general-to-specific econometric methodology to estimate the following comprehensive model, which captures the long-run determinants of public expenditure:

$$\begin{aligned}\ln(G_t) = \lambda_0 + \lambda_1 \ln(P_{gt} / P_{yt}) + \lambda_2 \ln(Y_t / POP_t) + \lambda_3 \ln(POP_t) + \lambda_4 \ln(AGEMR_t) + \\ \lambda_5 DV(coup)_t + \lambda_6 EDV_t + \lambda_7 \ln(U_t) + \lambda_8 \ln(SEREMR_t) + \lambda_9 \ln(OPEN_t) + \\ \lambda_{10} \ln(HHIT_t) + \lambda_{11} \ln(DTAXR_t) + \lambda_{12} \Delta \ln(P_{yt}) + e_t\end{aligned} \quad (4)$$

An important step before estimating equation (4) is to determine the time series properties of the data. This is an important issue since the use of non-stationary data in the absence of cointegration can result in spurious regression results. To this end, the Augmented Dickey-Fuller (ADF) test has been adopted to examine the stationarity, or otherwise, of the time series data. It was found that all the time series variables in equation (4) were I(1), or stationary after first differencing. In this paper the lowest value of the Akaike Information Criterion (AIC) has been used as a guide to determine the optimal lag length in the ADF regression. These lags are added to the ADF regression to ensure that the error term is white noise. It is worth emphasising that since there are only 31 annual observations for the various variables studied in this paper, the unit root test results should be taken with a pinch of salt as the ADF test is appropriate for large samples.

Let us assume that all the variables in equation (4) are I(1) and the resulting residuals are I(0). According to Engle and Granger (1987), it can then be stated that there exists a corresponding error-correction mechanism (ECM or e_{t-1}) model of the following form:

$$
\begin{aligned}
\Delta\ln\left(G_t\right) = \gamma_0 &+ \sum_{i=0}^{p}\gamma_{1i}\Delta\ln\left(\frac{P_g}{P_p}\right)_{t-i} + \sum_{i=0}^{p}\gamma_{2i}\Delta\ln\left(\frac{Y}{POP}\right)_{t-i} + \sum_{i=0}^{p}\gamma_{3i}\Delta\ln\left(POP\right)_{t-i} + \sum_{i=0}^{p}\gamma_{4i}\Delta\ln\left(AGEMR\right)_{t-i} \\
&+ \sum_{i=0}^{p}\gamma_{5i}\Delta\ln\left(U\right)_{t-i} + \sum_{i=0}^{p}\gamma_{6i}\Delta\ln(SEREMR)_{t-i} + \sum_{i=0}^{p}\gamma_{7i}\Delta\ln(OPEN)_{t-i} + \sum_{i=0}^{p}\gamma_{8i}\Delta\ln(HHIT)_{t-i} \\
&+ \sum_{i=0}^{p}\gamma_{9i}\Delta\ln(DTAXR)_{t-i} + \sum_{i=0}^{p}\gamma_{10i}\Delta^2\ln(P_{yt})_{t-i} + \gamma_{11}DV(coup)_t + \gamma_{12}EDV_t + \sum_{i=1}^{p}\delta_i\Delta\ln\left(G\right)_{t-i} + \theta e_{t-1} + v_t
\end{aligned}
\tag{5}
$$

where γ_{ji} are the estimated short-term coefficients; θ represents the feedback effect or the speed of adjustment whereby short-term dynamics converge to the long-term equilibrium path formulated in equation (4); δ_i denotes the estimated coefficients of the lagged dependent variable to ensure that v_t or the disturbance term is white noise; *e,* or the ECM, is obtained from equation (4), and Δ indicates the first-difference operator.

The general-to-specific methodology can be used to omit insignificant variables in equation (5) on the basis of a battery of maximum likelihood tests. In this method, joint zero restrictions are imposed on explanatory variables in the unrestricted (general) model to obtain the most parsimonious and robust equation in the estimation process. However, one may argue that the Engle-Granger method is appropriate if there are only two variables in the cointegrating equation. In other words, if there are more than two variables, it is possible that there could exist more than one cointegrating relationship between the variables, rendering the Engle-Granger two step procedure inadequate. To address this issue the multivariate Johansen cointegration technique was initially used to determine the number of cointegrating vectors. However, given the lack of long and consistent time series data (*i.e* only 31 observations), the Johansen method is also inappropriate, as the cointegration results, with only 31 observations, were very sensitive to the lag length, the inclusion or exclusion of the intercept term, or a trend in the cointegration equation, and/or the VAR specification. It should be noted that the max-eigenvalue and trace tests on equation (4) indicate that there is one cointegrating vector at the 1 per cent level. In these tests we have allowed only one lag and an term in the cointegrating vector and the VAR but with no trend in the cointegrating vector and the VAR model. The multivariate cointegration test results have not been reported here but they are available from the authors upon request.

Some relevant time series data on government in Fiji

As mentioned previously Fiji is categorised as a lower middle income country by the World Bank. Unlike federations such as the US, Canada, Australia and Germany, Fiji has a government structure which consists of only a central government and a (relatively small) local government sector. In this respect it is similar to the United Kingdom (pre-devolution) and New Zealand.

This study employs aggregate data on all public expenditure. It would be desirable if we could separate government expenditure (say) on the security system and defence, given that governments may make decisions on defence expenditure in a quiet different way from civilian expenditure. However, such a disaggregation of the data is not available for the 1969-1999 period. This creates an apples-and-oranges problem which we cannot resolve. Data limitations preclude a disaggregated analysis.

Figure 1 presents time series data on real GDP and real government current expenditure (in 1989 constant prices) for the period analysed in this study, 1969-1999. It is clear that GDP has experienced some fluctuations through time. Note the decrease in GDP and government expenditure in 1987 and 1988. Figure 2 shows the plot of government and GDP deflators whereas Figure 3 presents a graph of real GDP per capita. As can be seen the impact of the 1987-1988 military coups on real GDP per capita is quiet evident. For further details on the structure of the Fiji economy see, *inter alia*, Kasper, Bennett and Blandy (1988) and Treadgold (1992). Table 2 presents descriptions of the data employed and summary statistics.

[Figures 1 to 3 about here]

[Table 2 about here]

Empirical results and policy implication of study

As mentioned above it is very important to examine the time series properties of the data. The empirical results of the ADF unit root test are summarised in Table 3. According to the test results, all of the variables appearing in the estimated parsimonious equation reported in Table 4 are integrated of order one, I(1), and they become stationary after first differencing. Since all the variables in equation (4) are I(1), the Engle-Granger two-step procedure can be used to examine if this equation represents a long-term relationship.

[Table 3 about here]

Table 4 presents the results of estimating the comprehensive long-run model of public expenditure in Fiji using the 1969-1999 data. As seen, all the estimated coefficients are significant at least at the 5 per cent level and have the expected theoretical signs. This equation performs very well in terms of goodness-of-fit (adjusted R^2 = 0.945) and passes the overall *F* test at the one per cent level. In addition, this equation passes each and every diagnostic tests.

[Table 4 about here]

There are a number of important points that can be drawn from the estimated long-run coefficients of the public expenditure model. First, the relative price coefficient (–0.67) indicates that the demand for government goods and services in Fiji is inelastic. This coefficient is in the relevant range reported in the prior literature. Second, the coefficient on per capita income (+0.94) indicates that the demand for public goods and services is normal: given that this coefficient is less than unity, there is no evidence that Wagner's law applies in the context of Fiji. Third, this comprehensive model includes the measure of structural change (AGEMR) with the expected (and significant) negative coefficient (-0.34). This means that in the long-run as the agricultural sector of the Fijian economy declines in relative importance, there is an increased demand for existing services, and/or a demand for new services, provided by government.

Fourth, the variable (SEREMR), measuring interest group influence, is highly significant with a relatively larger long-run elasticity of 1.17. This is not counter-intuitive given the nature of government decision-making processes in Fiji. Borcherding's (1985) inability to specify the numerical importance of the institutional variables did not indicate that such variables were irrelevant: this econometric analysis shows conclusively that "institutions matter" in terms of explaining the growth of recurrent government expenditure in Fiji. Fifth, it is also important to observe that the 1987-1988 military coups, as measured by DV(*Coup*), have exerted a highly significant adverse impact on government expenditure in Fiji.

As mentioned earlier, insignificant variables, the taxation variables concerning fiscal illusion (*i.e.* HHIT, and DTAXR), EDV, OPEN and inflation, were omitted by applying several maximum likelihood tests involving joint restrictions on explanatory variables in order to obtain the most parsimonious and robust estimates. Also we have undertaken exhaustive diagnostic tests. (The estimated results have been obtained by using PcGive 9.21 (Hendry and Doornik, 1999).

Attention is now directed to the second stage of the Engle-Granger representation procedure. Table 5 presents the estimated results of an error correction model (ECM) capturing short-run dynamics of public expenditure as formulated in equation (5). The general-to-specific methodology has been adopted in estimating equation (5) by omitting insignificant lagged variables and undertaking a battery of maximum likelihood tests. Joint zero restrictions have been imposed on insignificant explanatory variables in the unrestricted (or general model) to obtain the most parsimonious and robust equation in the estimation process. The parsimonious short-term model of public expenditure includes all of the long-term determinants of public expenditure except for U and DV(Coup).

[Table 5 about here]

In other words, the results reported in Table 5 indicate that the short-run sources of the growth of public expenditure are changes in relative prices, per capita income, the ratio of agriculture employment to total employment, the ratio of service employment to total employment; and the lagged growth rate of public current expenditure. All the estimated coefficients are statistically significant at least at the 5 per cent level, with the only exception being $\Delta \ln(G)_{t-1}$, and have the expected signs. Having the expected sign with a magnitude of 0.27, the variable $\Delta \ln(G)_{t-1}$ is a proxy to capture bureaucratic inertia or incrementalism. This variable is statistically significant at the 11 per cent level. In terms of goodness-of-fit statistics, though expressed in Δln, with an adjusted R^2 of 0.332, the short-run dynamic equation performs reasonably well. As with equation (4), this equation also passes each and every diagnostic test. Table 5 also reveals that the feed-back coefficient (or adjustment speed) is as high as –0.873, indicating that in every year 87 per cent of the divergence between the short-run public expenditure growth from its long-run path, as formulated in equation (4), is eliminated.

The significance of this paper lies in the fact that it presents the first empirical estimates of the magnitudes of those factors that can explain current government expenditure in Fiji. Thus policy makers (and their bureaucrats) now have a means whereby they can predict the effect on government expenditure of changes in important determining variables of that expenditure. Hence, one of the "black holes" that had previously confronted Fiji's policy makers is now subject to some light.

Concluding Remarks

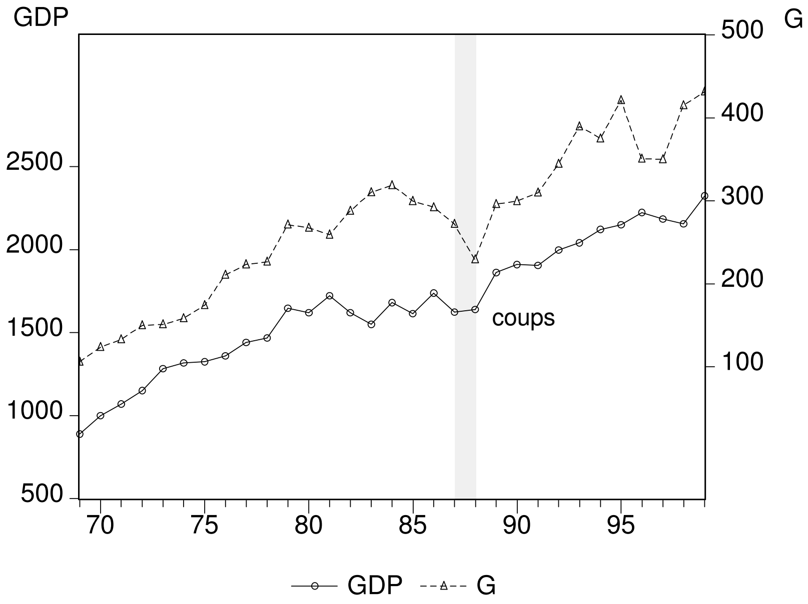
The existing literature of the demand for government goods and services is dominated by studies of western countries and services provided by state or local governments. This study is "a little bit different" in that it is one of the first such studies of a middle income country, with a (single) government sector providing services generally supplied by central and state governments in other countries. With respect to the first point it should not be automatically concluded that economic analysis of this kind is not applicable to a country such as Fiji: it should be recalled that Pryor (1968) succeeded in analysing government behaviour of countries with markedly different systems, and that Wagner and Weber (1975) successfully analysed governments with different organisational and behavioural (competition or monopoly) characteristics.

The central focus of this paper is to provide an answer to the question posed by Borcherding (1985) concerning the relative importance of long- and short-run economic/apolitical and institutional/political factors in determining government expenditure in Fiji. It is found that variables from both the institutional/political model and the economic/apolitical model of the determinants of the demand for government services are necessary. Thus, this study provides, not only further evidence that "institutions matter", but that the conventional economic variables are also necessary to explain current government expenditure in Fiji.

Table 1 **Economic/structural and institutional explanatory variables applied in the real demand for government expenditure in Fiji**

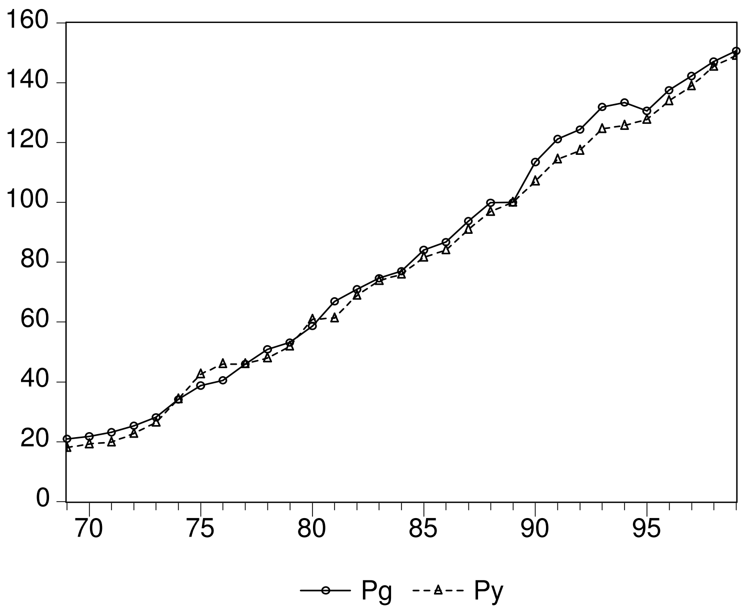
Variable name	Variable definition	Expected sign
Economic/Apolitical		
P_g	Government price deflator	–
P_y	GDP price deflator	+
P_g/P_y	Relative price ratio	–
Y/POP	Real per capita GDP	+
POP	Population	zero or +
AGEMR	Ratio of agricultural employment to total employment	–
Institutional/Political		
G_{t-1} or ΔG_{t-1}	Lagged real government expenditure (bureaucratic inertia or incrementalism)	+
SEREMR	Ratio of service employment to total employment	+
OPEN	Index of openness defined as total exports plus imports, divided by GDP	-
$\Delta \ln(P_{yt})$	Inflation rate using GDP price deflator	+
U	Unemployment rate	+
HHIT	Hirschman-Herfindahl index of tax complexity	–
DTAXR	Ratio of direct taxes to total taxes	–
EDV	Election dummy variable	+
DV(*Coup*)	*Coup* dummy variable (1987 and 1988)	-

Figure 1 **GDP and real government consumption expenditure (G), Fiji, 1969-1999, F$ million (1989 prices)**



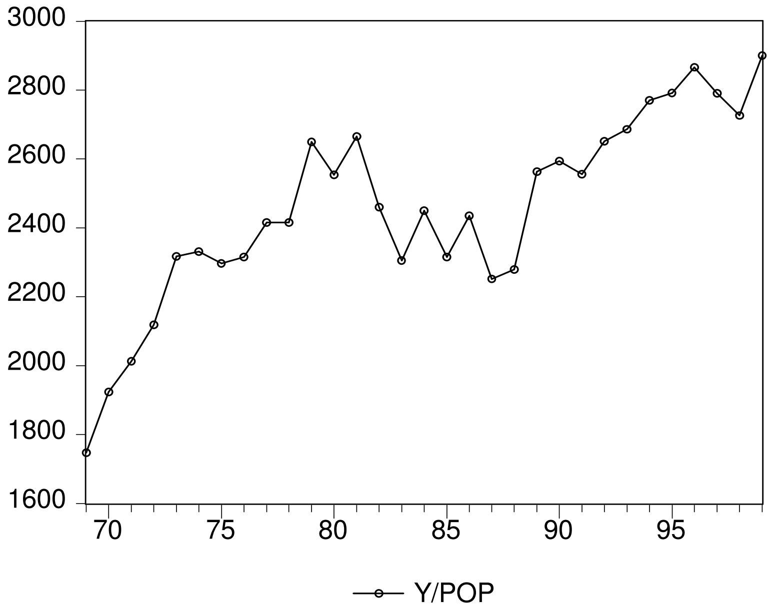
Source: World Bank (2001).
Note: The left-hand scale indicates GDP (F$ million) and the right-hand scale measures government current expenditure (F$ million), both in constant 1989 prices.

Figure 2 **Plot of government and GDP deflators, Fiji, 1969-1999, (1989=100)**



Source: World Bank (2001).

Figure 3 **Graph of real GDP per capita, Fiji, 1969-1999, (1989 F$)**



Source: World Bank (2001).

Table 2 **Summary statistics and description of the data employed, Fiji, 1969-1999**

Variables	Unit	Mean	Standard deviation	Minimum	Maximum
G	Fijian $ (1989 prices)	272000000	91083667	106000000	431000000
P_g/P_y	Ratio	1.03	0.08	0.83	1.17
(Y/POP)	Fijian $ (1989 prices)	2457	276	1747	2900
POP	Person	669627	91121	508000	801000
AGEMR	Ratio	3.5	1.5	1.77	7.4
U	Unemployment rate (%)	3.9	3.3	0.1	9.4
SEREMR	Ratio	64.0	5.0	52.2	72.0
OPEN	Ratio	1.04	0.15	0.80	1.30
HHIT[a]	1>HHIT>0	0.38	0.03	0.33	0.42
DTAXR[a]	Ratio	0.50	0.06	0.37	0.58
$\Delta \ln(P_{yt})$	inflation rate (%)	7.1	6.1	0	25.9

Sources: World Bank (2001), Asian Development Bank (1995), International Monetary Fund (various) and International Labour Office (various).

Note: [a] The HHIT and DTAXR variables are calculable only for the period 1974-1996 due to the lack of data.

Table 3 **ADF test results of the data employed in Tables 4 and 5, Fiji**

Variable	C (constant) and T (trend) in the equation	ADF test	
		ADF statistics	Optimum lag
$ln(G)_t$	C & T	-2.56	0
$\Delta ln(G)_t$	C	-5.87*	0
$ln(P_g/P_y)_t$	C & T	-2.25	1
$\Delta\ ln(P_g/P_y)_t$	C	-5.51*	0
$ln(Y/POP)_t$	C & T	-3.34	0
$\Delta\ ln(Y/POP)_t$	C	-6.21*	0
$ln(AGEMR)_t$	C & T	-3.09	0
$\Delta\ ln(AGEMR)_t$	C	-7.00*	0
$ln(U)_t$	C & T	-1.53	0
$\Delta\ ln(U)_t$	C	-5.15*	0
$ln(SEREMR)_t$	C & T	-2.81	0
$\Delta\ ln(SEREMR)_t$	C	-5.79*	0
ECM_t	C & T	-5.38*	0

* indicates that, based on the MacKinnon critical values, the corresponding null hypothesis is rejected at the 1% significance level.

Table 4 **Empirical results for the long-run, ln(G)$_t$, model, Fiji, 1969-1999**

Variable	Estimated elasticities	*t*-statistics*	Prob.	Expected signs
Intercept	7.575	2.7	[0.01]	
$ln(P_g/P_y)_t$	-0.668	-2.2	[0.04]	-
$ln(Y/POP)_t$	0.940	2.9	[0.01]	+
$ln(AGEMR)_t$	-0.345	-2.7	[0.01]	-
$ln(U)_t$	0.043	2.5	[0.02]	+
$ln(SEREMR)_t$	1.174	2.2	[0.03]	+
DV(coup)	-0.176	-2.9	[0.01]	-

Order of integration of the stochastic residuals: I(0)
Goodness-of-fit statistics:
Adjusted R^2=0.945
Overall F statistic $F(6,24)$ = 87

Diagnostic tests:		
DW	1.79	
AR 1-2	F (2, 22) = 1.27	[0.30]
ARCH 1	F (1, 22) = 0.55	[0.47]
Normality	χ^2 (2) = 0.09	[0.96]
White Xi^2	F (11, 12) = 0.99	[0.50]
RESET	F (1, 23) = 0.76	[0.39]

Notes: a) * indicates that the standard errors of the coefficients have been corrected by the White HAC method before calculating *t*-ratios; b) figures in square brackets show the corresponding probabilities; and c) the estimated method is OLS.

Table 5 **Empirical results for the short-run, $\Delta \ln(G)_t$, model, Fiji, 1971-1999**

Variable	Estimated elasticities	*t*-statistics*	Prob.	Expected signs
Intercept	-0.001	0.0	[0.96]	
$\Delta ln(P_g/P_y)_t$	-0.616	-3.3	[0.00]	-
$\Delta ln(Y/POP)_t$	0.914	2.3	[0.03]	+
$\Delta ln(AGEMR)_t$	-0.224	-2.9	[0.01]	-
$\Delta ln(SEREMR)_t$	0.811	2.3	[0.03]	+
$\Delta \ln(G)_{t-1}$,	0.271	1.6	[0.11]	+
ECM_{t-1}	-0.873	-2.9	[0.01]	-

Order of integration of the stochastic residuals: I(0)
Goodness-of-fit statistics:
Adjusted R^2=0.332
Overall F statistic $F(6,22) = 3.3$

Diagnostic tests:

Test	Statistic	Prob.
DW	1.82	
AR 1-2	F (2, 20) = 0.84	[0.45]
ARCH 1	F (1, 20) = 0.00	[0.97]
Normality	χ^2 (2) = 1.88	[0.39]
White Xi^2	F (12, 9) = 0.20	[0.99]
RESET	F (1, 21)=0.00	[0.98]

Notes: a) * indicates that the standard errors of the coefficients have been corrected by the White HAC method before calculating *t*-ratios; b) figures in square brackets show the corresponding probabilities; and c) the estimated method is OLS.

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