Monetary and fiscal policies in Fiji: a test of effectiveness

Jauhari Dahalan and T.K. Jayaraman

Granger causality tests confirm the results from the bounds-testing approach of the long-run relationships between Fiji's economic growth and fiscal and monetary policies and exports. Government expenditure, representing fiscal policy, is assessed to have a greater impact than monetary policy and exports on Fiji's gross domestic product. In the short run, only fiscal policy and exports influenced growth.

Jauhari Dahalan, Faculty of Economics, Universiti Utara Malaysia.

T.K. Jayaraman, School of Economics, Faculty of Business and Economics, University of the South Pacific.

Following political independence in the second half of the last century, some of the Pacific island countries preferred to pursue monetary independence by introducing national currencies. Subsequently, they have been using monetary policy along with fiscal policy to promote growth and development. Monetary independence has enabled them to manipulate their exchange rates to insulate their economies from imported inflation or to enhance the competitiveness of the limited range of exports.

With the introduction of public sector reforms and deregulation in the 1990s, central bank independence gained respectability and assumed more importance. Simultaneously, the use of direct instruments of monetary policy was replaced by market-based, indirect instruments. These indirect instruments included the issuing of short-term paper aimed at influencing short-term interest rates and as a key indicator of the monetary stance, as in the case of Fiji. Those Pacific island countries with their own currencies have now accumulated over two decades of experience in the pursuit of independent monetary policies. The objective of this article is to assess the effectiveness of monetary and fiscal policies on economic growth. Since the span of data for all Pacific island countries with their own central bank is not long enough to make reliable inferences across the region, Fiji has been selected as the country under study.

Background

Fiji, and other Pacific island countries, inherited a relatively large public sector from their former colonial rulers. The private sectors have remained relatively weak, and thus governments have remained major providers of employment. As a result, budgets are dominated by wages and salaries, with limited allocations for essential maintenance expenditure for physical infrastructure such as roads, bridges and public buildings. Moreover, very little budget surplus has been generated to provide for expenditure on income-creating assets.

The ratio of current expenditure to capital expenditure in Pacific island countries, including Fiji, has been around four to one. As external aid inflows have declined and their effectiveness closely monitored by donors, governments in Pacific island countries have resorted to public borrowing to finance annual fiscal deficits. In small states with excess liquidity in the banking system, domestic borrowing is not difficult. Fiji, in particular, stepped up public borrowing to finance its deficits, with the dominant lender being the Fiji National Provident Fund—a public institution that collects monthly deductions from the salaries and wages of those employed in the public and private sectors (and their employers). With investor confidence low after the 2000 coup and little expectation of rapid private sector recovery, it seems that it was felt appropriate to boost investment by incurring fiscal deficits. Fiji's fiscal deficits for the last four years appear to be part of countercyclical measures to compensate for the fall in private demand.

Fiji has not had central bank financing of its budget deficits for more than two decades. Whether public expenditure is undertaken purely as countercyclical measure to meet the projected fall in demand or simply as a political commitment to increase the rate of growth, the resultant fiscal expansion has been causing concern in one area: the increase in public debt. Public debt in Fiji is currently at 58 per cent of GDP. This high level of debt raises concerns about the growing annual interest burden on government. Interest payments must be made out of the government's primary balance, defined as the surplus of current revenues over current expenditure, excluding interest payments. If economies fail to generate primary surpluses, the result will be a further deterioration in their fiscal balance, leading to increases in debt levels when interest payments have to be financed by additional public borrowing.

The role of monetary policy in Fiji (as a small, open economy under a fixed exchange rate regime) is limited. Moreover, financial markets are shallow with few securities traded, and these are dominated by government bonds and treasury bills. Further, the participants are very few: five commercial banks, a small number of government-owned enterprises, and the Fiji National Provident Fund (Asian Development Bank 2001). Although since 1988 interest rates in Fiji have been free from government controls, and other restrictions on financial sector institutions (such as government-directed lending for priority sectors) have been discontinued, interest rates have not fallen. Since the financial sector is not fully developed, monetary policy has been found to have a weak effect as a transmission mechanism that is evident only through credit channels. In these circumstances, it is no surprise that Fiji has come to rely on fiscal policy as a tool for stimulating growth.

Aware that monetary policy has a limited role under a fixed exchange rate regime, the Reserve Bank of Fiji (RBF) has been promoting fiscal and monetary policy coordination (Ali and Jayaraman 2001). Further, the RBF has been pursuing an independent monetary policy through open-market type operations

in RBF Notes to absorb excess liquidity following the 2000 coup. The economic circumstances have been favourable: as liquidity was high and private sector sentiments were pessimistic, the increase in government investment did not crowd out private investment and there was no upward pressure on interest rates.

Literature survey and motivation for study

Fijian data for several macroeconomic variables covers a longer period than for other countries in the region, forming time series of 30-plus years. Consequently, the data has received considerable attention from researchers. Occasional revisions of the series have prompted researchers in the RBF (Morling and Williams 2000) and in overseas institutions, including the Centre for Independent Studies in Australia (Hughes 2003; Gosarevski et al. 2004), to raise concerns about data quality.

Aside from the traditional topics of sugar (for example Narayan and Prasad 2004) and tourism (for example, Narayan 2002), the studies available on Fiji range across topics such as the nexus between defence spending and growth (Narayan and Singh 2005), demand for money (Rao and Singh 2005, Jayaraman and Ward 2000), money multiplier (Jayaraman and Ward 2004), trade liberalisation (Narayan and Smyth 2005), migration (Narayan and Smyth 2003), the relationship between aid and growth (Gounder 2001), balance of payments (Fontana 1998), and Fiji's furniture industry (Luzius 2004). Narayan and Narayan (2003) and Doessel and Valadkhani (2003) have published work on Fiji's budgets and fiscal policies. These two studies dealt with the sustainability of Fiji's budget deficits and the demand for public expenditures, respectively. To date, there has been no research on the efficacy of fiscal and monetary policy in promoting growth, which is the objective of both policies. This article seeks to fill the gap.

Data and estimation techniques

Since the objective is to examine the impact of monetary and fiscal policies on growth, real gross domestic product (RGDP) was chosen as the dependent variable while real government expenditure (RGE) was chosen as the proxy for fiscal policy. Since Fiji, like the other countries in the region with their own currency, has a fixed exchange rate regime that is linked to a basket of currencies of major trading partners, the real net foreign assets (RNFA) variable is chosen to represent monetary policy. Following the monetarist approach (Johnson 1972), it is hypothesised that expansionary monetary policy would result in increased money supply that would increase the demand for domestic goods and assets, which would spill over to foreign goods and assets. The result would be a fall in real net foreign assets (Fontana 1998; Jayaraman 1993).

Fiji has a high level of dependence on exports and tourism. Periods of expansion and contraction in the world economy result in fluctuations in the demand for goods and services of small, open island economies and in the export prices they receive (Deere 1990). Monetary and fiscal adjustment policies can be employed to achieve a balance between growth and foreign exchange reserves. Therefore, real net exports (RNEX) is included in the analysis to represent the foreign trade variable. To investigate the linkage between economic growth and fundamental macroeconomic variables, annual data from 1970 to 2002 is used. The length of this time period is considered to be adequate for a robust econometric analysis.

Studies of this kind have employed various econometric specifications (Bynoe

1994; Osmond 1992; Chowdhury 1986; and Darrat 1984) including the standard St Louis single equation model (Andersen and Jordan 1968) and its modified version with exports included as a measure of openness. This study used a modified St Louis cointegrating four-equation vector autoregressive system (VAR). The approach is along the lines of Jordan, Craigwell and Carter (2000), which allows estimation of long-run relationships that are theoretically consistent and have a clear economic interpretation. Further, the short-run dynamics are fully estimated within the framework of the error-correction model (VECM) and the directions of the Granger causality of the cointegrated variables are examined.

The long-run economic growth model for estimation purposes is specified as follows

$$LRGDP_t = \acute{a} + \hat{a}_1 LRGE_t + \hat{a}_2 LRNFA_t + \hat{a}_3 LREXP_t + \grave{\imath}_t \quad (1)$$

where LRGDP is real GDP, LRGE is real government spending, LRNFA is real net foreign assets, and LREXP is real exports, all in logarithms.

The objective of the estimation is to detect the presence of any long-run relationship between economic growth and the monetary and fiscal policy variables as well as exports. In applying any cointegration technique, we must first determine the degree of integration of each variable in the equation.

The main approach to cointegration analysis, the Johansen (1988, 1991) maximum likelihood, reduced-rank approach, requires a certain degree of pre-testing to ascertain that all the explanatory variables are integrated of order one, I(1). This is necessary because in the presence of a mixture of I(0) and I(1) regressors, standard statistical inference based on conventional cointegration tests is no longer valid. To avoid this difficulty and pre-testing for unit roots, Pesaran and Shin (1998) and Pesaran et al. (2001) introduced a cointegration test known as the auto-regressive distributed lag (ARDL) approach. The advantage of the ARDL bounds-testing approach is that it allows testing for the existence of a cointegrating relationship between variables in levels irrespective of whether the underlying regressors are I(0) or I(1).

Empirical results

To implement the bounds-testing approach, we start by estimating Equation 1 as an unrestricted error-correction model, or a conditional ARDL-ECM, as follows

$$\begin{aligned}\Delta LRGDP_t = {} & \alpha_0 + \sum_{k=1}^{n} \alpha_{1k} \Delta LRGDP_{t-k} + \sum_{k=1}^{n} \alpha_{2k} \Delta LRGE_{t-k} \\ & + \sum_{k=1}^{n} \alpha_{3k} \Delta LRNFA_{t-k} + \sum_{k=1}^{n} \alpha_{4k} \Delta LREXP_{t-k} \\ & + \delta_1 LRGDP_{t-1} + \delta_2 LRGE_{t-1} + \delta_3 LRNFA_{t-1} \\ & + \delta_4 LREXP_{t-1} + \mu_t \end{aligned} \quad (2)$$

The first step in the ARDL bounds-testing approach is to estimate Equation 2 by ordinary least squares. Next, to test the null hypothesis that there is a long-run relationship among the variables conduct an *F*-test on the lagged levels of the variables, that is, H_0: $\ddot{a}_1 = \ddot{a}_2 = \ddot{a}_3 = \ddot{a}_4 = 0$. As noted by Pesaran et al. (2001), the *F*-statistic follows a non-standard distribution irrespective of whether the variables are I(0) or I(1). Pesaran et al. provide two asymptotic critical values for the bounds-testing procedure**.** However, Narayan (2005) argues that the critical values generated by Pesaran et al. cannot be used for small samples because they were generated from large sample sizes. In this study we use the critical values generated by Narayan (2005). If the estimated *F*-statistic is higher than the upper bound of the critical values, the null

Table 1 **Bound tests, *F*-statistics for cointegration, 1970–2002**

Dependent variable	*F*-statistics	10 per cent CV		5 per cent CV		1 per cent CV	
LRGDP	4.046***	2.69	3.89	3.27	4.63	4.59	6.36
LRGE	2.105	2.69	3.89	3.27	4.63	4.59	6.36
LRNFA	2.088	2.69	3.89	3.27	4.63	4.59	6.36
LREXP	3.796	2.69	3.89	3.27	4.63	4.59	6.36

Note: Asymptotic critical values were obtained from critical values for the bounds test: case III: unrestricted intercept and no trend (Narayan 2005:1,988). **** denotes significance at 10 per cent level.
Source: Authors' calculations.

hypothesis of no long-run relationship is rejected. If the estimated *F*-statistic is less than the lower bound of critical values, the null hypothesis of no cointegration cannot be rejected. Table 1 reports the *F*-statistic associated with the null hypothesis of no cointegration, along with the asymptotic critical values of the bounds testing procedure.

The results in Table 1 show that only in regard to the equation with DLRGDP as the dependent variable do we find the calculated *F*-statistic exceeds the upper critical value at the 10 per cent level of significance. Given the criticisms of the quality of these data (for example, Morling and Williams 2000), we decided to accept the result at the 10 per cent level of significance. Accordingly, it is concluded that there exists a unique and stable long-run relationship with LRGDP as a dependent variable and LRGE, LRNFA and LRGE as explanatory variables. Bounds test equations were also estimated for each regressor as a dependent variable against short-run dynamics of economic growth. Inspection of the *F*-statistics shows no long-run relationships when LRGE, LRNFA and LREXP are the dependent variables (Table 1). Thus, the variables LRGE, LRNFA and LREXP can be treated as the long-run forcing variables for explaining the variations in LRGDP.

Given the existence of cointegration with LRGDP as an endogenous variable, the second stage is to estimate the ARDL model to derive the long-run and short-run coefficient estimates. We determined the order of the ARDL model by means of the model selection procedure of the Akaike information criterion. Equation 3 below presents the coefficients obtained from estimating the selected ARDL (1,0,1,1) model using the Akaike Information Criterion (AIC), allowing a maximum of one lag for each variable. *T*-values are in parentheses below the coefficients.

$$\begin{aligned} LRGDP = {} & \underset{(0.894)}{-1.064} + \underset{(4.271)}{0.509}LRGDP_{t-1}^{*} + \underset{(3.103)}{0.802}LRGE_{t}^{*} \\ & - \underset{(-0.049)}{0.01}LRNFA_{t} - \underset{(-2.138)}{0.521}LRNFA_{t-1}^{**} \\ & + \underset{(2.510)}{0.842}LREXP_{t}^{**} - \underset{(-1.318)}{0.458}LREXP_{t-1} \end{aligned} \quad (3)$$

where * and ** represent the 1 per cent and 5 per cent levels of significance, respectively. We also carried out tests on the stability of the model. Both the CUSUM and CUSUMSQ tests suggest that the model is stable over the sample period (the results are available on request).

The long-run model of the corresponding ARDL model is derived in Equation 4, displaying the long-run coefficient estimates with *t*-values.

$$LRGDP = \underset{(-0.905)}{-2.167} + \underset{(3.616)}{1.631}LRGE^{*} - \underset{(-3.364)}{1.081}LRNFA^{*} + \underset{(1.101)}{0.782}LREXP \quad (4)$$

Our estimated log-run model (Equation 4) reveals that the coefficient of government expenditure (LRGE) is positive and statistically significant, indicating that government expenditure has a strong influence on economic growth. The coefficient of net foreign assets (LRNFA) is negative and significant. Although the estimated coefficient of exports (LEXP) has the expected positive sign, it is found to be statistically not significant. Our estimated long-run elasticity coefficient of LRGE implies that a one per cent rise in government spending would lead to an increase in real output by 1.6 per cent. On the other hand, the elasticity coefficient of LRNFA, which represents monetary policy, indicates that an expansionary monetary policy, signified by a fall in RNFA by 1 per cent, would result in the country's real output increasing by 1.1 per cent. The results thus confirm the hypothesis advanced here that for a small open economy such as Fiji, with an under-developed financial sector, fiscal policy (defined here as government expenditure) is a more important explanator of economic growth than monetary policy.

Granger causality

Engle and Granger (1987) demonstrate that once variables are found to be cointegrated, there always exists a corresponding error-correction representation in which the short-run dynamics of the variables in the system are influenced by the deviation from equilibrium. Accordingly, it is implied that changes in the dependent variables are a function of the level of disequilibrium in the cointegrated relationship (captured by the error-correction term), as well as changes in other explanatory variable(s).

Given that economic growth in Fiji and the specified macroeconomic variables are cointegrated, the Granger representation theorem suggests that the dynamic relation between these variables should be examined within the framework of the vector error-correction model (VECM). The short-run dynamics of the economic growth series for Fiji is represented by

$$\Delta RGDP_t = \mu + \gamma_1 ECT_{t-1} + \sum_{i=1}^{K1} \delta_{1i} \Delta RGDP_{t-i} + \sum_{i=1}^{K2} \kappa_{1i} \Delta RGE_{t-i} + \sum_{i=1}^{K3} \tau_{1i} \Delta RNFA_{t-i} + \sum_{i=1}^{K4} \phi_{1i} \Delta REXP_{t-i} + \varepsilon_t \quad (5)$$

where ECT_{t-1} is the error correction term obtained from the cointegration equation, γ, δ, τ, ξ, and ρ are estimated parameters, and ε_t is stationary random processes with zero mean and constant variance. Granger (1988) notes that the ECM provides two channels through which Granger causality can be detected. In the cointegrated system above (Equation 5), RGE does not Granger-cause RGDP if all the κ1is are jointly insignificant or γ1 is statistically insignificant. This hypothesis of no causality from RGE to RGDP can be formulated as H_0: $\kappa_{1i} = 0$ and $\gamma_1 = 0$, for all i. Conversely, the hypothesis of no causality from RGDP to RGE can be expressed as H_0: $\kappa_{2i} = 0$ and $\gamma_2 = 0$, for all i.

The estimated error correction representation of the model is

$$DLRGDP = \underset{(-0.894)}{-1.064} + \underset{(3.103)}{0.801}DLRGE_t^{*} - \underset{(-0.049)}{0.01}DLRNFA_t + \underset{(2.510)}{0.842}DLREXP_t^{**} - \underset{(-4.121)}{0.491}\,ECT_{t-1}^{*}$$

$\bar{R}^2 = 0.4$, DW statistic=2.328, SE of regression=0.175, F(4,26)=6.366[0.001], SD of dependent variable=0.224 and residual sum of squares = 0.736.

Table 2 **Granger causality tests based on a vector error correction model, Wald tests χ^2**

Dependent variable	Excluded variable				t-statistic
	ΔLRGDP	ΔLRGE	ΔLRNFA	ΔLREXP	ECT_{t-1}
ΔLRGDP		9.627*	0.002	6.301**	–4.121*
ΔLRGE	0.79		2.231	1.111	-
ΔLRNFA	0.04	2.231		0.328	-
ΔLREXP	6.558**	.069	4.632***		-

Note: All variables except for the lagged error term ECT_{t-1} are in first differences. The asterisks *,** and *** indicate the null hypothesis of no causality is rejected at the 1 per cent, 5 per cent and 10 per cent significance levels, respectively.
Source: Authors' calculations.

ECT, the error correction term, has the expected negative sign and is also found to be statistically significant, confirming the results from the bounds test of cointegration. Indeed, as Kremers et al. (1992) argued, testing the significance of $ECT_{(t-1)}$, which is supposed to carry a negative coefficient, is a relatively more efficient way of establishing cointegration. Thus, changes in real output in Fiji are a function of disequilibrium in the contegrating relationship, with the size of the ECT coefficient measuring the speed of adjustment to the disequilibrium within one year. The *F*-statistic is significant at the 1 per cent level and the Durbin-Watson statistic does not indicate any sign of serial correlation.

Turning to short-run causal effects, which are obtained by the Wald $\chi 2$ test, we find exports and government expenditures are significant in the GDP equation, whereas net foreign assets, representing monetary policy, is not (Table 2). The interpretation is that in the short run, exports and fiscal policy Granger-cause GDP, while monetary policy in the short run does not Granger-cause GDP. In the government expenditure and net foreign assets equations, none of the variables is significant. The interpretation is that neither GDP nor exports Granger-cause government expenditures and neither GDP nor exports Granger-cause net foreign assets. In the exports equation, we find GDP and net foreign assets are significant, indicating each of them individually Granger-cause exports.

Summing up, in the long run the government expenditure and net foreign assets variables, representing fiscal policy and monetary policy, respectively, as well as exports affect Fiji's economic growth. In the short run, Fiji's economic growth is influenced by government expenditure and exports; net foreign assets, the proxy for monetary policy, has no impact on growth. This suggests that, there is a strong link flowing from fiscal policy to growth.

Conclusions

This study estimated the impact of fiscal and monetary policies and exports on Fiji's economic growth. It used real government expenditure and real net foreign assets respectively to represent fiscal policy and monetary policy. The study covered a 33-year period from 1970 to 2002. Employing the

bounds-testing procedure advanced by Pesaran et al. (2001), it was found that a long-term relationship exists between economic growth and the three variables. However, in the short run, the economic growth of Fiji is positively influenced only by fiscal policy and exports; monetary policy has no impact. Causality tests indicate that in the long run the line of causation runs from fiscal policy, monetary policy and exports to growth and not in the other direction.

References

Ali, A. and Jayaraman, T.K., 2001. *Monetary and fiscal policy coordination in Fiji*, Working Paper 2001/01, Reserve Bank of Fiji, Suva.

Asian Development Bank, 2001. *Financial Sector Development in Pacific Island Economies*, Asian Development Bank, Manila.

——, 2005. *Key Indicators of Asian and Pacific Developing Countries*, Asian Development Bank, Manila.

——, 2006. *Asian Development Outlook 2006*, Asian Development Bank, Manila.

Andersen, L.C. and Jordan, J.L., 1968. 'Monetary and fiscal actions: a test of their relative importance in economic stabilization', *Federal Reserve Bank of St Louis Review*, 50(10):11–24.

Bynoe, A., 1994. 'Money and fiscal influences on economic activity in African countries', *African Review of Money, Finance and Banking*, 12(1):63–71.

Chowdhury, A., 1986. 'Monetary policy, fiscal policy and aggregate economic activity: some further evidence', *Applied Economics*, 20(1):63–71.

Darrat, C., 1984. 'The dominant influence of fiscal action in the developing countries', *Eastern Economic Journal*, X(3):271–84.

Deere, C., 1990. *In the Shadow of the Caribbean Sun*, Westview Press, Denver.

Doessell, G. and Valadkhani, A., 2003. 'The demand for public expenditures in Fiji', *Pacific Economic Bulletin*, 18(1):55–68.

Engle, R.F. and Granger, C.W.J., 1987. 'Cointegration and error correction: representation, estimation and testing', *Econometrica*, 55(2):251–76.

Fontana, M., 1998. 'The effects of monetary policy on balance of payments in Fiji', *Pacific Economic Bulletin*, 13(1):57–71.

Gounder, R., 2001. 'Aid–growth nexus: empirical evidence from Fiji', *Applied Economics*, 33(8):1,008–19.

Gosarevski, S., Hughes, H. and Windybank, S., 2004. *The Pacific is viable*, Issue Analysis No. 43, Centre for Independent Studies, Sydney.

Granger, C.W.J. and Newbold, P., 1974. 'Spurious regressions in econometrics', *Journal of Econometrics*, 2:111–20.

Hughes, H., 2003 *Aid has failed the Pacific*, Issue Analysis No. 33, Centre for Independent Studies, Sydney.

International Monetary Fund (IMF), 2003. *International Financial Statistics Yearbook 2003*, International Monetary Fund, Washington, DC.

——, 2005. *International Financial Statistics, CD ROM, Dec 2005,* International Monetary Fund, Washington, DC.

Jayaraman, T.K., 1993. *Monetary approach to Fiji's balance of payments*, Economics Division Working Paper South Pacific 93/2, Research School of Pacific and Asian Studies, The Australian National University, Canberra.

Jayaraman, T.K. and Ward, B., 2000. 'Demand for money in Fiji: an econometric analysis', *Pacific Economic Bulletin,* 15(1):81–93.

——, 2004. 'Is a money multiplier relevant in a small, open economy: empirical evidence from Fiji', *Pacific Economic Bulletin*, 19(2):48–53.

Johansen, S., 1988. 'Statistical analysis of cointegrated vectors', *Journal of Economic Dynamics and Control*, 12:231–54.

——, 1991. 'Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models', *Econometrica*, 59(6):1,551–80.

——, 2000. 'Modelling of cointegration in the vector autoregressive model', *Economic Modelling*, 17(3):359–73.

Johnson, H.J., 1972. 'The monetary approach to balance of payments theory, *Journal of Financial and Quantitative Anlaysis*, 7(4):1,555–72.

Jordan, A., Craigwell, R. and Carter, A., 2000. 'The potency of monetary and fiscal policies in Caribbean countries : a cointegrating VAR approach', *Savings and Development*, XXIV(3):325–42.

Kremers, J.J., Ericson, N.R. and Dolado J.J., 1992. 'The power of cointegration tests', *Oxford Bulletin of Economics and Statistics*, 54(3):325–47.

Luzius, M., 2004. 'Fiji's furniture industry', *Pacific Economic Bulletin*, 19(2):33–47.

Morling, S. and Williams, G., 2000. *Modeling output fluctuations in Fiji*, Working Paper No. 01/2000, Reserve Bank of Fiji, Suva.

Narayan, P.K., 2002. 'A tourism model for Fiji', *Pacific Economic Bulletin*, 18(1):103–16.

——, 2005. 'The saving and investment nexus for China: evidence from cointegration tests', *Applied Economics*, 37(17):1,979–90.

Narayan, P.K. and Narayan, S., 2003. 'The sustainability of Fiji's budget deficit: an econometric analysis', *Pacific Economic Bulletin*, 18(2):77–91.

Narayan, S. and Narayan, P.K., 2004. 'An export demand model for Fiji', *Developing Economies*, XLII(1):95–112.

Narayan, P.K. and Singh, B., 2005. *Modeling the relationship between defence spending and economic growth for the Fiji islands*, Working Paper No. 21/2005, Department of Economics, University of the South Pacific, Suva.

Narayan, P.K. and Prasad, B., 2004. 'Relationship between Fiji sugar corporation's profitability and sugar cane production', *Pacific Economic Bulletin*, 19(2):20–32.

Narayan, P.K. and Smyth, R., 2003. 'The determinants of immigration from Fiji to New Zealand: an empirical re-assessment using the bounds testing approach', *International Migration*, 41(1):6–33.

——, 2005. 'Trade liberalisation and economic growth in Fiji: an empirical assessment using the ARDL approach', *Journal of Asia Pacific Economy*, 10(1):96–115.

Osmond, D., 1992. 'The potency of monetary and fiscal policies in Sub-Saharan countries: St Louis Model estimate', *African Review of Money, Finance and Banking*, 1(1):17–27.

Pesaran, M.H. and Shin, Y., 1998. 'An autoregressive distributed lag modeling approach to cointegration analysis', in S. Strom (ed.), *Econometrics and Economic Theory in the Twentieth Century: the Ragnar Frisch Centennial Symposium*, Cambridge University Press, Cambridge.

Pesaran, M.H., Shin, Y. and Smith R., 2001. 'Bounds testing approaches to the analysis of level relationships', *Journal of Applied Econometrics*, 16(3):289–326.

Rao, B. and Singh, R, 2005. 'A cointegration and error-correction approach to demand for money in Fiji: 1971–2002', *Pacific Economic Bulletin*, 20(2):72–86.

United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), 2004. *Economic and Social Survey 2004*, UNESCAP, Bangkok.

United Nations Development Programme, 2004. *Human Development Report*, United Nations, New York.

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