

**SCHOOL OF ECONOMICS**

WORKING PAPER

**How did External and Internal Shocks Affect Fiji?  
An Empirical Study: 1970-2008**

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**Abstract**

Pacific island countries have been affected by the ongoing global economic downturn. The impact of recessionary effects has not been uniform as the degree of global interdependence varies amongst Pacific island countries. By employing a vector autoregression (VAR) model, this paper investigates the impact of shocks, both domestic and external, on Fiji's output during a 39-year period. The study findings suggest that domestic shocks are more important than regional and global shocks in affecting the economic performance of Fiji.

*Keywords: Global shock, regional shock, real output, financial crisis*

## 1. Introduction

Fiji's economy since its independence in 1970 has been subjected to various shocks from time to time. These shocks originate both from within and outside. The domestic shocks, which comprise natural disasters, such as earthquakes, cyclones and flooding or droughts, and man-made disasters, including military coups, adversely affect both supply and demand sides. Positive supply shocks which boost supply mostly stem from policy reforms and institutional improvements aimed at better governance, thereby increasing productivity. Positive demand shock ones are those directed towards stepping up aggregate demand, including rise in private sector activities or fiscal stimulus in times of depressed domestic demand.

On the other hand, the external shocks, which affect domestic supply and demand either in positive or a negative way, are beyond the control of Fiji. While positive shocks which boost supply are introduction of new technology and transfer of skills, negative supply shocks which dent domestic production, include rise in oil price and fall in terms of trade. Negative demand shocks stem from slowing down of the economies overseas, decreasing the demand for Fiji's exports and services, including tourism.

During the past four decades, Fiji was exposed to three major recessions which afflicted the world economies. They were the global recession of 1975, preceded and worsened by sharp rise in oil prices following the Arab oil embargo in 1973; recession of 1982, which was due to tight monetary policies by central banks in rich countries for controlling inflation following a second oil price shock and debt crisis experienced by Latin American countries; the recession of 1991, which was caused by crisis in the US saving and loan institutions, banking crisis in Scandinavian countries, exchange rate crisis in European economies, Gulf war and subsequent rise in oil price. Fiji was largely spared of the ill-effects of the past three recessions, since the globalization process had not yet become deep rooted.

The first round effects of the ongoing global economic recession<sup>1</sup> since the third quarter of 2008, which is the severest of all since the Great Depression of 1930s were not severe. The recession followed the financial crisis, which was initially by ignited by the sub-prime mortgage loans in the US, resulting in loan defaults and the burst of property and other asset price bubbles. As Fiji's financial sector institutions were not exposed to the US debt, Fiji was initially spared. Once the financial crisis soon deteriorated into to a credit crunch, leading to declining production and consumption, thus initiating a downward spiral in worldwide real sector economic activities, Fiji like all other developing countries, including Pacific island countries, were all affected. These impacts are all well documented: declines in many areas, including export revenues, tourism earnings, foreign direct investment and aid inflows and remittances, which have been main drivers of growth (AusAID 2009).

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<sup>1</sup> Labeled by United Nations as the Great Recession to distinguish it from the Great Depression of the last century, the current worldwide recession is the product of three crises (UNESCAP 2009). These three crises are: (i) volatility and surge in food and fuel prices in early 2008; (ii) the financial crisis in the advanced countries since mid 2007; and (iii) the climate change calamities since 2006.

It is also recognized that before the full impact of the global recession, there was an unprecedented surge and volatility in food and fuel prices in the first half of 2008. Fiji experienced a rapid depletion in foreign exchange reserves, due to high dependency on imports of food and fuel together with limited export earning capacity. Economic interdependence of an economy is signified by transmission of shocks from one economy to another.

An empirical investigation of macroeconomic interdependence of Fiji, as to how shocks of different originating from outside, global or regional, or within Fiji itself, will be of interest to policy makers. The paper is organized on the following lines: the second section presents a brief background of Fiji's growth performance and its economic interdependence with the rest of the world in comparison to others; the second section outlines the modeling methodology employed for the study; the third section reports the results; and the fourth and final section presents some policy conclusions.

## 2. Fiji's Economy: a Review

Fiji (population 853,000), whose selected key indicators are given in Table 1, is the leading economy in the South Pacific region. A comparative macroeconomic performance is presented in Table 2. Fiji shares many commonalities with the rest of the PICs besides communal land tenure. These include proneness to natural disasters, including droughts, cyclones and floods affecting one part or another of the country every year (Jayaraman and Choong 2006a). Fiji has a significant manufacturing base, a relatively large endowment of skilled labour and trained professionals and a thriving services sector, including tourism and commercial activities, both retail and wholesale. Manufacturing activities consist of sugar, traditionally meant for exports under preferential trading arrangements with European Union, and consumer goods such as biscuits, detergents and cooking oil both for domestic consumption as well as exports to other island countries.

**Table 1: Selected key indicators in Fiji**

Land Area (Sq.km.'000)	18.3
Population (2006: '000)	853
Per Capita GDP (US\$) Current prices: 2006	3,306
Aid Per Capita in US\$ (2006)	65
Aid as percentage of GDP (2006)	1.8
Human Development Ranking (2006)	106
Annual Average Growth Rate: 2001-08 (percent))	0.9
Annual Average Inflation: 2001-08 (percent)	3.0
Annual Ave. Fiscal Balance: 2001-08(% of GDP)	-3.8
Ann. Ave. Current Account Balance:2001-07(% of GDP)	-11.4

Source: ADB (2008), UNESCAP (2008, 2009), AUSAid (2009)

**Table 2: Pacific Island Countries: Macroeconomic Statistics: 1996-2008**

<b>Real GDP Growth Rate (%)</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Fiji	2.1	4.8	-2.2	1.3	8.8	-1.6	1.9	3.2	0.9	5.5	0.6	3.4	-6.6	-1.2
Papua New Guinea	-3.3	6.6	-6.3	4.7	1.9	-2.5	-0.1	-0.2	2.2	2.7	3.7	2.6	6.7	7.3
Samoa	6.6	7.3	0.8	2.4	3.1	7.1	8.1	1.8	3.1	3.4	5.2	2.6	6.1	3.3
Solomon Islands	5.4	1.9	-1.7	3.2	-1.6	-14.2	-8.2	-2.8	6.5	8.0	5.0	6.1	10.3	7.0
Tonga	2.9	-0.5	-3.2	3.5	2.3	5.4	7.2	1.4	3.4	1.1	-3.3	4.4	-0.3	1.0
Vanuatu	4.7	7.2	8.6	4.3	-3.2	2.7	-2.6	-7.4	3.2	5.5	6.5	7.2	6.6	5.7

Source: ADB (2009), UNESCAP (2009)

Fiji has a fixed exchange rate regime, which has served the country well. Since most of the imports have been sourced from Australia and New Zealand, domestic inflation has remained low. With no mineral resources, Fiji is heavily dependent on imports ranging from wheat flour, rice and other items of food and beverages, to fuel and capital and transportation machinery and equipment. Fiji's exports have been sugar, garments, *kava*, a non-narcotic beverage root crop, spices and gold. Export earnings have been far less than imports with the result that trade balance always remained negative. However, tourism earnings and in recent years, remittances have provided substantial support to country's current account balance, minimising pressures on the fixed exchange rate regime.

Fiji's economic growth since its political independence in 1970 until 1986 was steady despite the adverse effects of annual natural disasters. In the first decade of its independence (1970-1979), the annual average growth rate was a close 6 percent. Following the two military coups in 1987, economic growth was on the decline, as tourism was adversely affected since the country remained isolated by the world community for a while and the investment environment became unattractive to overseas investors. In order to prevent capital outflows following the deterioration in political climate, the interim government imposed severe exchange controls on various transactions. The government took another major step: it devalued the Fiji dollar in two steps, totaling about 33 percent. Further, there was a shift in emphasis on economic strategy. It deregulated the economy for bringing domestic prices in line with world prices, by abolishing subsidies with a view to encouraging Fiji's external competitiveness.

Although democracy returned with elections in 1990, the atmosphere was one of uncertainties all around until 1997, when a new constitution was adopted paving the way for recovery. However, much damage had been done by then, as out-migration of skilled workers had reduced Fiji's human capital (D'Hoore 2006). The continued state of weak investment climate and political sanctions against Fiji affected capital inflows. In 1998, in the wake of the Asian financial crisis, the authorities resorted to devaluation of the currency by about 10 percent, adversely affecting export earnings.

Following the adoption a new constitution in 1997, fresh elections were held in 1999. Before the newly elected government could settle down, investor confidence was given yet another jolt in 2000, this time by a civilian coup. Once again, the international community applied sanctions against Fiji. As a result, tourism earnings decreased and FDI inflows became scarce. Economic growth declined by 3 percent in 2000.

Order was restored when another round of fresh elections were held in 2001. With the assumption of a coalition government, the next five years witnessed steady recovery. Tourism boomed again and the newly emerged garment industry flourished as exports to USA and EU under quota arrangements grew. Despite the decline in the pre-eminence of sugar as a major export earner, the economy grew thanks to expansionary fiscal policies. The latter gave rise to annual budget deficits during each of the five years until 2006.

Fiscal deficits were financed by public borrowing (Jayaraman and Choong 2006b). In addition, As government felt that domestic borrowing sources were getting dried up and that it would be preferable to take advantage of good credit standing, it floated in July 2006 the very first international bond for a total of US\$ 150 million. Overseas private borrowing helped the country's international reserve position by adding equivalent foreign exchange, further reinforcing exchange rate stability. As it helped to add to the real resources of the country, inflation was kept low as well.

Private sector confidence also returned, accompanied by an unprecedented credit boom (Jayaraman and Choong 2007a). As fiscal deficits and growth in bank credit stepped up aggregate demand, which spilled over into demand for imports, annual trade and current account deficits (Jayaraman and Choong 2007b) began to widen each year during this period rising from 1.2 percent of GDP in 2002 to 22.6 percent of GDP in 2006 (UN ESCAP 2008). With the sugar industry already on the decline and with the expiry of garment export quota arrangements with USA effective January 1, 1995, and as there were no new sources of exports, pressures were soon felt on exchange rate (Jayaraman and Choong 2008).

An uninterrupted growth for a five year period, which no doubt resulted in the overheating of the economy by fiscal deficits and private sector credit boom, was however, halted by a military coup in December 2006 before the completion of the full five-year term of the elected government. Since January 2007, the economy has been in a downward spiral. Tourism was the major victim, though it made a slight recovery in later months. The economy, which grew at annual rate of 3.4 percent in 2006, plunged in 2007 to a record negative growth rate (-6.6 percent). The estimated growth rate in 2008 was -0.2 percent (AusAID 2009).

The interim government since 2007 followed a cautious fiscal policy. The fiscal deficit was reduced to 1.5 percent of GDP. However, as world economic conditions deteriorated in mid 2008, Fiji's economy came under fresh stress, this time induced by factors beyond its control. With exports declining and tourism sector stagnating, the predominant concern has been with protecting foreign reserves, which were at F\$ 832 million in December 2008, adequate to cover just about three months' imports. Oil price was at its highest, US\$145 per barrel in mid 2008 and domestic inflation for the month of September 2008 alone was 20 percent (annualized). As the global oil price plummeted from its historical peak of to below US\$50 per barrel in subsequent

months of 2008, there was some relief on the inflation front. The annual inflation for 2008 was 7.5 percent in December 2008.

In 2009, with the officially declared recession in Australia, New Zealand and the USA, prospects of any economic recovery through exports of goods and tourism services were becoming less promising. One of the first decisions immediately after the abrogation of the Constitution in April 2009 was the devaluation of the Fiji dollar by 20 percent. One immediate result was the foreign reserves were upvalued at the new exchange rate and at the end of April 2009, they rose to F\$ 631 million, as against F\$ 429 million in March 2009 (RBF 2009). The latest figures show that Fiji's international reserves in September 2009 reached F\$ 1 billion.

### 3. Modeling Methodology, Data and Results

Our study, which covers a 39-year period (1970-2008) employs the vector autoregression (VAR) modeling methodology to investigate how shocks from one country to another are transmitted. We choose three variables: real gross domestic product (RGDP) of USA, RGDP of Australia representing regional output, and RGDP of Fiji. All real outputs are expressed in index numbers in order to remove the influence of exchange rate changes.

#### *The Model*

For investigating the nature of macroeconomic interdependence of Fiji, all the variables are transformed into logs and then entered into analysis. There are three equations in the VAR model:

$$\Delta LUSA_t = \beta_{10} + \sum_{i=1}^j \beta_{2i} \Delta LUSA_{t-j} + \sum_{i=1}^j \beta_{3i} \Delta LAUS_{t-j} + \sum_{i=1}^j \beta_{4i} \Delta LFIJI_{t-j} + \varepsilon_{1t} \quad (1)$$

$$\Delta LAUS_t = \alpha_{10} + \sum_{i=1}^j \alpha_{2i} \Delta LUSA_{t-j} + \sum_{i=1}^j \alpha_{3i} \Delta LAUS_{t-j} + \sum_{i=1}^j \alpha_{4i} \Delta LFIJI_{t-j} + \varepsilon_{2t} \quad (2)$$

$$\Delta LFIJI_t = \gamma_{10} + \sum_{i=1}^j \gamma_{2i} \Delta LUSA_{t-j} + \sum_{i=1}^j \gamma_{3i} \Delta LAUS_{t-j} + \sum_{i=1}^j \gamma_{4i} \Delta LFIJI_{t-j} + \varepsilon_{3t} \quad (3)$$

Where

*USA* = RGDP of USA, representing global RGDP;

*AUS* = RGDP of Australia representing regional RGDP;

*FIJI* = RGDP of Fiji;

$\Delta$  = the first difference operator; and

*L* = natural logs

$\varepsilon_t$  = is the white noise error term

We assume that a shock to output of USA initially affects the regional output (RGDP of Australia), and output of Fiji; a shock to Australia's GDP affects RGDP of Fiji; and Fiji's output

affects neither RGDP of USA nor that of AUS. Accordingly, we enter the variables: *LUSA*, *LAUS*, and *LFIJI*. We employ the Akaike information criterion for determining the lag length.

#### *Variance Decomposition*

We employ variance decomposition analysis to determine how each endogenous variable responds over time to a shock in that variable and in every other endogenous variable. It helps us to determine how much of the total variance of Fiji's output is explained by the variances of USA output and Australia output. Thus, it enables us to make conclusion about the proportion of changes in a variable resulting from its own shocks as well as shocks to other variables in the system (Enders, 1995, p. 311). For instance, if USA and Australia output shocks explain none of the forecast error variance of Fiji's RGDP at all time horizons, it would mean economic growth of Fiji evolves independently of the global and regional shocks.

### 4. Results and Interpretations

#### *Unit root test*

Before undertaking the analysis, we transformed the three variables into natural logarithms and tested their order of integration by using ADF and Ng-Perron (Ng and Perron, 2001) unit root tests. The results of the unit root test are reported in Table 3. As shown in the table, it is found that all variables are non-stationary at level. However, these variables are stationary after first differencing. It is confirmed that all variables are integrated of order one. Therefore, we entered the logs of the three variables in their first differences for further econometric analyses. We conducted the cointegration tests, which revealed that all the three variables are cointegrated. Therefore, we proceed to next stage, namely variance decomposition analysis..

**Table 3: Results of Unit Root Tests**

Country / Variable	ADF		Ng-Perron	
	Level	First Difference	Level	First Difference
<i>LUSA</i>	-2.8728 (2)	-3.2036** (0)	-6.2967 (0)	-7.8073* (2)
<i>LAUS</i>	-3.2117 (1)	-5.2281** (3)	-7.4718 (0)	-7.7052* (0)
<i>LFIJI</i>	-1.4291 (1)	-4.6431** (0)	-3.5773 (0)	-7.0188* (0)

Notes: The ADF critical values are based on Mckinnon. The optimal lag is chosen on the basis of Akaike Information Criterion (AIC). The null hypothesis for both ADF and Ng-Perron tests is a series has a unit root (non-stationary). The asterisks \* and \*\* denote the rejection of the null hypothesis at the 10% and 5% level of significance, respectively.

#### *Variance decomposition analysis*



Variance decomposition analysis is based on Choleski factorization with the following ordering<sup>2</sup>, namely: *LUSA*, *LAUS* and *LFIJI*. The analysis is done up to a 10-year horizon for 39-year period (1970-2008).

The results of variance decomposition procedure are presented in Table 4. Test results show that the variability in Fiji's output is influenced to the largest extent by its own shock, which ranges from 76% to 52% in the first five years, The influence of domestic shocks on own output, however decreases in the next long run, hovering around 50% anyway. The proportion of variability in Fiji's output is explained more by Australia's output, representing regional output than by USA output, representing global output in the immediate short term. Shock to global output, represented by USA, plays a minor role in the first year. However, its impact assumes a larger proportion (43%) of variability in Fiji's output in the medium term, decreasing to 35% in the long run. Thus, in the medium- and long- terms, global output has relatively larger impact than regional impact on Fiji's output.

**Table 4: Results of Variance Decomposition Analysis in Fiji, 1970-2008**

Period	S.E.	LUSA	LAUS	LFIJI
1	0.0413	0.9503	22.5431	76.5066
2	0.0496	16.9593	15.7778	67.2630
3	0.0550	21.3235	15.0998	63.5767
4	0.0628	34.9498	11.6051	53.4451
5	0.0635	34.8432	12.3148	52.8420
6	0.0665	40.0229	11.6512	48.3259
7	0.0695	42.9908	11.6270	45.3822
8	0.0740	39.5681	13.2135	47.2184
9	0.0789	37.2966	15.7584	46.9450
10	0.0822	34.5225	15.7418	49.7358

Note: Cholesky Ordering: LUSA LAUS LFIJI

## 5. Conclusion

Employing variance decomposition analysis, we investigated the effects of global and regional and own shocks on Fiji's output during the past the 39-year (1970-2008) period. It is found that Fiji's output is more influenced by domestic shocks than global and regional output shocks. The domestic shocks include not only those arising out of natural disasters, which are beyond the human control but also stemming from man-made disasters such as coups. It is apparent that some of them could be avoided and some dealt with more effective and deliberate measures, which are more focused on better governance, and policy reform measures.

The recommendations are:

- Identify areas for reforms at micro and macro levels, which are supportive of generating positive shocks

<sup>2</sup> We used different orderings of the variables. However, the findings are robust to changes.

- Avoid actions generating negative demand shocks
- Minimize impact of negative shocks arising out of volatility in imported food & fuel prices, by deliberate measures, such as devoting unused land and human resources, aimed at promoting local food production: root crops, vegetables & fruits
- Aim at self-reliance and self-sufficiency in areas

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