Why is the Fiji Dollar Under Pressure?

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Abstract

Under a fixed exchange rate system, exchange market pressures are exercised by various factors. Fiji’s currency, which is linked to a basket of currencies of its major trading partners under its fixed exchange rate system with occasional corrective adjustments, has been experiencing in recent months severe pressures. This paper estimates the exchange market pressures in Fiji over a 30-year period and seeks to study their determinants.

I. Introduction

Fiji’s rapid recovery, since the civilian coup of 2000 has been largely attributed to the countercyclical measures initiated by the interim government and later on continued by the elected government soon after the restoration of democracy with fresh elections in 2001. In the process, sizeable fiscal deficits were incurred in each year since 2001, all of which were financed through public borrowing (Jayaraman and Choong, 2006a). As the economy was marked by excess liquidity in the banking system mainly due to the then prevailing weak investor confidence and slow and sluggish response of the private sector, there were no upward pressures on interest rates.

With the gradual return of political stability over the next five years, there has been a revival of consumer confidence, with a steady rise in domestic credit, which began with modest increase in borrowings for consumer durables in 2002, soon spilling over into the real estate market (Jayaraman and Choong, 2006b). The consequences of domestic credit boom and continuous fiscal deficits manifested themselves in growing pressures on the country’s balance of payments and decline in foreign exchange reserves. In response to these developments, the Reserve Bank of Fiji (RBF), the country’s monetary authority raised its indicator interest rate in October 2005, as a measure towards controlling the growth in credit. Against the relentless growth in domestic credit in the next six months, RBF resorted to more drastic measures in May and June 2006 and further tightened its monetary stance, which included two rounds of increase in interest rate by one percentage point each time and a rise in the statutory minimum reserve ratio for commercial banks. The objective of this paper is to undertake an empirical study of exchange market pressure in Fiji over a 31-year period (1975-2005) with particular focus on its determinants.

Although there are a large number of studies on Fiji dealing with its fiscal policies (Narayan, et al., 2006b; Narayan and Narayan, 2004; Doessel and Valadkhani, 2003), monetary policies (Rao and Singh, 2006; Rao and Singh, 2005; Waqabaca and Morling, 1999), trade, balance of payments and exchange rate policies including effects of past devaluation on the economy (Singh, 2006; Narayan, 2006; Duleare 2005; Narayan and
Smyth, 2004, 2005; Reddy, 1997; Fontana, 1998; Jayaraman, 1993), there is no study so far, exclusively devoted to exchange market pressure in Fiji. Although a time series-cross sectional study covering a 31-year period (1970-2000) by Bird and Mandilaras (2006) studied Fiji along with 44 other countries in Latin America and the Caribbean and East Asia and the Pacific regions, its focus was understandably more diffused.

Our objective in this paper is, therefore to study Fiji’s case more specifically and to cover a more recent period as well. During the last five years (2001-2005), Fiji went through a phase of expansionary fiscal policies, which was also marked by a credit boom of unprecedented nature, leading to a rapid depletion of international reserves. Consequently, there were rumours of devaluation and reported speculative action by businessmen. The present paper, thus takes into account the gradual build up of pressures in its exchange market since 2000. The remainder of the paper is organized on the following lines: the second section reviews the trends in balance of payments and international reserves. The third section outlines the methodology adopted for the empirical analysis and reports results. The fourth and last section presents a summary, listing some conclusions of policy implications.

II. Fiji’s Exchange Rate Regime, Balance of Payments and International Reserves

Since April 1975, Fiji has been following the fixed exchange regime under which the exchange rate of the Fiji dollar is linked to a basket of currencies of its five major trading-partners: Australia, Japan, New Zealand, the United Kingdom and the United States. From the beginning of 2000, the British pound was replaced by euro. The weights in the basket are based on a three-year moving average of Fiji’s direction of trade, which are reassessed annually, but are not disclosed. On a daily basis, the exchange rate is determined in terms of buying and selling rates for U.S dollars and communicated to commercial banks.

Fixed rate regime

The fixed rate regime seems to have served the economy well in terms of providing an anchor for inflation and inflationary expectations. Price stability, which is one of the objectives of RBF’s monetary policy, for encouraging domestic private investment and foreign direct investment has been a notable achievement (Table 1) during recent years.
Table 1: Fiji: Selected Key Indicators

<table>
<thead>
<tr>
<th>Years</th>
<th>Annual Growth (percent)</th>
<th>Annual Inflation (percent)</th>
<th>Budget Deficits (% of GDP)</th>
<th>Domestic Credit (% of GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975-1984 (Average)</td>
<td>2.6</td>
<td>9.0</td>
<td>5.8</td>
<td>27.7</td>
</tr>
<tr>
<td>1985-1994 (Average)</td>
<td>1.9</td>
<td>6.1</td>
<td>5.3</td>
<td>45.4</td>
</tr>
<tr>
<td>1995-1999 (Average)</td>
<td>3.1</td>
<td>3.3</td>
<td>5.5</td>
<td>47.4</td>
</tr>
<tr>
<td>2000</td>
<td>-1.7</td>
<td>3.0</td>
<td>6.6</td>
<td>44.2</td>
</tr>
<tr>
<td>2001</td>
<td>2</td>
<td>2.3</td>
<td>9.4</td>
<td>40.8</td>
</tr>
<tr>
<td>2002</td>
<td>3.2</td>
<td>1.6</td>
<td>8.7</td>
<td>41.2</td>
</tr>
<tr>
<td>2003</td>
<td>1</td>
<td>4.2</td>
<td>9.2</td>
<td>46.7</td>
</tr>
<tr>
<td>2004</td>
<td>5.3</td>
<td>3.3</td>
<td>6.9</td>
<td>48.4</td>
</tr>
<tr>
<td>2005</td>
<td>0.7</td>
<td>2.7</td>
<td>4.3</td>
<td>59.0</td>
</tr>
</tbody>
</table>


Fiji’s monetary authority has been making periodical adjustments to the exchange rate. The Fiji dollar was devalued twice in 1988, by a total of 34 per cent with a view to stemming the capital outflows consequent to military coups, which demoralized the private sector confidence in the economy. Another devaluation by 20 per cent was resorted to in 1998 as a preventive step to meet the eventualities arising out of the Asian financial and currency crises of October 1997. These two devaluations were further defended on the grounds that they were resorted to as the required corrective measures for improving the competitiveness of the Fiji dollar.

Aside from these two major adjustments by way of substantial devaluation, RBF has not been effectively intervening in the market. It allows the exchange rate varying within the existing bound from +/- 0.07 percent of the central rate. The International Monetary Fund (2002) was reported to have advised RBF for widening the band to +/-2 percent. Exchange controls on capital movements, which came to be imposed during the post coup years of 1987-90 and 2000-01, have now been largely withdrawn, leaving the current account transactions in the balance of payments free. However, there still remain some quantitative restrictions in terms of Fiji dollars on offshore portfolio and direct investments by the Fiji National Provident Fund and other resident non-bank financial institutions, companies and individuals and in regard to payments for certain items. These are subject to case-by-case approval by RBF when in excess of specified threshold amounts in Fiji dollars. But, most of the transaction limits are rarely reached; and virtually all transactions are approved and processed within three-days. As IMF (2004) notes in their more recent consultations with RBF under Article IV of the IMF Charter, main restrictions appear to be on capital transactions by residents.
Balance of payments.

The overall balance in Fiji’s external accounts has been fairly comfortable until very recently. The two devaluations in 1988 and the one in 1998 not only helped Fiji to ward off expectations of speculative attack on the currency but also contributed towards restoring competitiveness of the country’s exports. Emergence of new exports in the efforts towards diversification, such as garments and spices, mineral water and other herbal based consumer goods also helped the country to record positive overall balance until 1999. However, in the years soon after 2000, expansionary fiscal policy measures and credit expansion resulted in bulging trade and current account deficits. The situation was exacerbated by a continuous decline in traditional exports such as sugar and gold, besides the discontinuance in 2005 by the US of its import quota of garments from Fiji. As against the annual growth rate of 3.5 percent in exports during 1990-2005, exports during the five year period of 2001-2005, increased only at a mere 0.9 percent per annum. The trade and current account deficits rose during the five-year period, simultaneously along with expanding fiscal deficits and increases in domestic credit to private sector. The trade and current deficits as percentages of GDP reached the historically high figures of 27 per cent and 17 per cent of GDP in 2005 (Table 2).

<table>
<thead>
<tr>
<th>Years</th>
<th>Trade Balance (% of GDP)</th>
<th>Current Account Balance (% of GDP)</th>
<th>BOP overall Balance (% of GDP)</th>
<th>International Reserves (F$ million)</th>
<th>International Reserves (months of imports)</th>
<th>Exchange Rate (US$/F$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975-1984 (Average)</td>
<td>-6.7</td>
<td>-3.80</td>
<td>-1.3</td>
<td>120.7</td>
<td>6.2</td>
<td>0.90</td>
</tr>
<tr>
<td>1985-1994 (Average)</td>
<td>-10.4</td>
<td>-6.64</td>
<td>2.1</td>
<td>325.1</td>
<td>6.1</td>
<td>1.39</td>
</tr>
<tr>
<td>1995-1999 (Average)</td>
<td>-11.6</td>
<td>-0.15</td>
<td>2.1</td>
<td>728.7</td>
<td>6.4</td>
<td>1.64</td>
</tr>
<tr>
<td>2000</td>
<td>-10.9</td>
<td>-2.87</td>
<td>-0.9</td>
<td>1039.0</td>
<td>7.1</td>
<td>2.13</td>
</tr>
<tr>
<td>2001</td>
<td>-10.8</td>
<td>-7.74</td>
<td>1.2</td>
<td>994.4</td>
<td>6.2</td>
<td>2.28</td>
</tr>
<tr>
<td>2002</td>
<td>-14.7</td>
<td>-0.14</td>
<td>2.3</td>
<td>902.1</td>
<td>6.1</td>
<td>2.19</td>
</tr>
<tr>
<td>2003</td>
<td>-23.4</td>
<td>-7.79</td>
<td>-1.0</td>
<td>943.6</td>
<td>5.7</td>
<td>1.90</td>
</tr>
<tr>
<td>2004</td>
<td>-18.5</td>
<td>-17.12</td>
<td>-2.2</td>
<td>1045.6</td>
<td>5.0</td>
<td>1.73</td>
</tr>
<tr>
<td>2005</td>
<td>-27.2</td>
<td>-16.65</td>
<td>4.7</td>
<td>822.4</td>
<td>4.0</td>
<td>1.69</td>
</tr>
</tbody>
</table>


The pressures on the international reserve position soon began to be felt. Since 2001, the decline in reserves in terms of months of import cover has been steady. From a
comfortable position of 7.1 months of import cover in 2000, the international reserves declined to 5.7 months in 2003, 5 months in 2004 and 4 months in 2005. The latest figures made available by the Quarterly Economic Review by RBF for June 2006 reveal that international reserves reached the lowest ever figure of F$ 649 million, sufficient to cover 2.8 months of imports. The declining export performance and growing import demand despite rise in short term interest rate by RBF have given rise to speculations of another devaluation (Narayan, 2006; Narayan and Narayan, 2006). The next section undertakes a quantitative analysis of exchange market pressure.

III. Exchange Market Pressure: Methodology and Modeling

Exchange market pressure is studied against the background of a fixed exchange rate regime, under which monetary authorities intervene to maintain the rate at some desired level. Weymark (1993) refers to such a regime, as an intermediate system, under which interventions generate simultaneous changes in the exchange rate and foreign exchange reserves. In the fixed exchange rate system, money supply has two components, domestic credit and net foreign assets. Under the assumption that policy authorities did not employ domestic credit changes to influence exchange rate levels, Girton and Roper (1977) used the term exchange market pressure for referring to the magnitude of money market disequilibria that must be removed either through reserve or exchange rate changes. In such circumstances, exchange market pressure is the simple sum of the percentage changes in exchange rate and in foreign exchange reserves. Using a different model, which allowed intervention in terms of changes in domestic credit as well as changes in reserves, Roper and Turnovsky (1980) found that excess demand for money was equal to a linear combination of changes in exchange rate and in the monetary base.

Measure of exchange market pressure

Weymark (1995) proposed a general definition of exchange market pressure as follows: Exchange market pressure measures the total excess demand for a currency in international markets as the exchange rate change that would have been required to remove the excess demand in the absence of exchange market intervention, given the expectations generated by the exchange rate policy actually implemented.

The exchange market pressure, so defined, measures the size of the exchange rate change that would have occurred if the authorities refrain from intervening in the foreign exchange market. Weymark (1995) then proceeded to construct an open economy model under certain assumptions. These are: (i) domestic price level is influenced by both the level of foreign prices and the exchange rate but purchasing power does not necessarily hold; (ii) domestic output and the foreign price level are exogenous; (iii) the domestic market is well developed and the domestic and foreign assets are perfect substitutes; (iv) domestic residents hold domestic currency for transaction purposes and speculative balances for foreign claims; and (v) foreign and domestic interest rates are linked through
an uncovered interest parity condition. Weymark (1995) derived a summary statistic for measuring exchange market pressure (EMP) in Canada, which fulfils the critical conditions, namely perfect capital mobility and substitutability of financial assets between Canada and USA and the industrialized world.

In the context of the undeveloped nature of financial market in Fiji together with the facts that domestic and foreign assets are not freely traded substitutes and capital is not so mobile, the model employed by Weymark (1995) is not appropriate for Fiji’s economy. Recognizing the need for a more realistic model, we utilize the EMP measure developed by Girton and Roper (1977) and then modified and applied by Eichengreen, et al. (1996) and Bird and Mandilaras (2006).

We calculate EMP as follows:

\[
EMP = \alpha(d \log NEER) + \beta(d \log IR) - \gamma(d \log INTRES) \tag{2}
\]

where,

\[
NEER = \text{nominal effective exchange rate};
\]

\[
IR = \text{short-run interest rate (measured as Treasury bill rate)}; \text{and}
\]

\[
INTRES = \text{international reserves}.
\]

According to Eichengreen, et al. (1996), this framework is appropriate for those countries with intermediate exchange rate regimes, prone to speculative attack on the currencies. Increase in the exchange rate (defined as units of domestic currency per unit of foreign currency), denoting depreciation of domestic currency, and increase in short-term interest rate and decrease in international reserves would lead to a rise in the value of EMP index.

\[
\Delta EMP_i = \Delta e_i + \eta \Delta r_i
\]

where, 

\[
EMP = \text{exchange market pressure};
\]

\[
e = \log \text{of exchange rate (units of domestic currency per one unit of foreign currency)};
\]

\[
\eta = -\left[(a_2 + b_2)\right]^{-1}, \text{ } a_2 \text{ being the coefficient of } e \text{ in the estimated regression equation for log of domestic price level as dependent variable, the other independent variable being the log of foreign price level and } b_2 \text{ being the coefficient of interest rate in the estimated regression equation with log of money demand as the dependent variable, the other independent variables being log of domestic price level and log of real output}; \text{and}
\]

\[
\Delta r_i = \left[h_i R_t - h_{t-1} R_{t-1}\right]/M_{t-1}, \text{ where } h_i \text{ is the money multiplier in period } t, M_{t-1} \text{ is the inherited money stock in period } t, \text{ and } R_t \text{ is the stock of foreign exchange reserves in period } t.
\]
In their study, Bird and Mandilaras (2006) suggested that the weights $\alpha$, $\beta$ and $\gamma$ be calculated by the corresponding ratios of one over the standard deviation of each variable divided by the sum of all three ratios. For example, the weight for nominal effective exchange rate can be obtained as follows:

$$
\alpha = \frac{1}{SD_{d \log \text{NEER}}} \left( \frac{1}{1 + \frac{1}{SD_{d \log \text{NEER}}} + \frac{1}{SD_{d \log \text{INTRES}}}} \right)
$$

where $SD$ is the standard deviation.

This weighting scheme was developed to avoid the dominance of volatile variable in EMP calculation by assigning the more volatile variable with low weight and vice versa (Bird and Mandilaras, 2006).

Data and Results

The data for the study are drawn from International Financial Statistics of International Monetary Fund (IMF) (2006) and RBF’s Quarterly Review (2006) and Global Development Finance 2006 published by the World Bank (2006), covering the 31-year period (1975-2005). They include foreign exchange reserves (in Fiji Dollars), real GDP (in Fiji dollars), inflation (in percent), nominal effective exchange rate (units of Fiji dollar per United States dollar), budget deficit (as percent of GDP), external debt (as percent of GDP) and domestic credit (as percent of GDP).

Table 3 presents the calculated EMP values from 1975 to 2005. As illustrated in Figure 1, EMP values exhibit a stable trend during 1975-1987, with pronounced volatility towards the end of 1980s and in the early 1990s. The substantial increases in EMP values are apparently due to speculative pressures exercised by political uncertainty caused by the two military coups in mid 1987. The upward pressure, which was introduced in the foreign exchange market in 1987, continued to linger on until 1992. After 1992, the EMP values again became relatively stable with minor fluctuations until 1998. The EMP fluctuated up and down significantly after 1998, reaching its peak in 2004.

Factors influencing EMP

The factors influencing EMP in the developing economies are primarily macroeconomic in nature. These include fiscal deficits, external debt and private sector domestic credit. Fiscal imbalances are financed through domestic borrowing as well as external borrowing. Disadvantages of domestic borrowing for deficit financing are obvious: it would crowd out private investment by raising interest rates. On the other hand, external borrowing has no such impact in the short run, as it adds to money supply as well as real resources from overseas. Though the choice is left to the governments, borrowing in overseas commercial markets depends upon the international rating status. Further, external debt servicing involves interest and installment payments in foreign exchange,
which requires the projects funded by external debt should not only generate sufficient revenues in local currency, but also adequate incremental foreign exchange for debt servicing in the future. Insufficient foreign exchange would contribute to build up of balance of payment difficulties eventually exercising pressures on exchange rate.

Table 3: Estimated Values of EMP

<table>
<thead>
<tr>
<th>Year</th>
<th>EMP</th>
<th>Year</th>
<th>EMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>-0.0388</td>
<td>1991</td>
<td>0.2018</td>
</tr>
<tr>
<td>1976</td>
<td>-0.0012</td>
<td>1992</td>
<td>-0.3026</td>
</tr>
<tr>
<td>1977</td>
<td>0.0003</td>
<td>1993</td>
<td>-0.2152</td>
</tr>
<tr>
<td>1978</td>
<td>0.0318</td>
<td>1994</td>
<td>-0.0871</td>
</tr>
<tr>
<td>1979</td>
<td>0.1354</td>
<td>1995</td>
<td>0.1931</td>
</tr>
<tr>
<td>1980</td>
<td>0.0049</td>
<td>1996</td>
<td>-0.0592</td>
</tr>
<tr>
<td>1981</td>
<td>0.0474</td>
<td>1997</td>
<td>-0.1520</td>
</tr>
<tr>
<td>1982</td>
<td>0.0295</td>
<td>1998</td>
<td>-0.3320</td>
</tr>
<tr>
<td>1983</td>
<td>0.0242</td>
<td>1999</td>
<td>-0.0009</td>
</tr>
<tr>
<td>1984</td>
<td>0.0941</td>
<td>2000</td>
<td>1.0513</td>
</tr>
<tr>
<td>1985</td>
<td>-0.0048</td>
<td>2001</td>
<td>-0.8316</td>
</tr>
<tr>
<td>1986</td>
<td>-0.0615</td>
<td>2002</td>
<td>0.2866</td>
</tr>
<tr>
<td>1987</td>
<td>0.2828</td>
<td>2003</td>
<td>-1.0763</td>
</tr>
<tr>
<td>1988</td>
<td>-0.9075</td>
<td>2004</td>
<td>7.9360</td>
</tr>
<tr>
<td>1989</td>
<td>0.9187</td>
<td>2005</td>
<td>0.5940</td>
</tr>
<tr>
<td>1990</td>
<td>0.5701</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fiji’s budget deficits in recent years were financed through public borrowing. This was in accordance with a deliberate policy decision taken in the late 1980s, as part of the 1987 post-coup economic action agenda, to reduce external debt. The government began to retire most of the outstanding debt payment due to both World Bank and Asian
Development Bank\textsuperscript{2} much before the due dates (Jayaraman and Ratnayake, 1996). Further, it decided to limit any further external borrowing to fund only revenue generating physical infrastructure projects. The result was that the outstanding total external debt stock, which consisted of both government and private sector, was reduced from 44 percent of GDP in 1988 to below 10 percent of GDP in the second half of the 1990s. Since 2004, the total external debt stock has been hovering around 8 percent of GDP (Table 4).

Table 4: Fiji's External Debt

<table>
<thead>
<tr>
<th>Year</th>
<th>Country's External Debt (as % of GDP)</th>
<th>Government External Debt (as % of GDP)</th>
<th>Government External Debt (as % of Total Government Debt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975-1984 (Average)</td>
<td>22.7</td>
<td>20.2</td>
<td>NA</td>
</tr>
<tr>
<td>1985-1994 (Average)</td>
<td>29.2</td>
<td>27.1</td>
<td>NA</td>
</tr>
<tr>
<td>1995</td>
<td>12.8</td>
<td>7.1</td>
<td>13.4</td>
</tr>
<tr>
<td>1996</td>
<td>10.4</td>
<td>6.4</td>
<td>12.1</td>
</tr>
<tr>
<td>1997</td>
<td>10.5</td>
<td>6.6</td>
<td>11.3</td>
</tr>
<tr>
<td>1998</td>
<td>12.1</td>
<td>7.5</td>
<td>18.8</td>
</tr>
<tr>
<td>1999</td>
<td>9.1</td>
<td>5.3</td>
<td>14.1</td>
</tr>
<tr>
<td>2000</td>
<td>8.4</td>
<td>5.8</td>
<td>14.1</td>
</tr>
<tr>
<td>2001</td>
<td>7.3</td>
<td>5.3</td>
<td>11.9</td>
</tr>
<tr>
<td>2002</td>
<td>8.1</td>
<td>5.0</td>
<td>10.3</td>
</tr>
<tr>
<td>2003</td>
<td>9.4</td>
<td>4.1</td>
<td>8.0</td>
</tr>
<tr>
<td>2004</td>
<td>8.1</td>
<td>5.7</td>
<td>7.3</td>
</tr>
<tr>
<td>2005</td>
<td>8.1</td>
<td>3.6</td>
<td>6.8</td>
</tr>
</tbody>
</table>


Consequently, deficit financing in subsequent years came to be accomplished mainly through domestic public borrowing until 2005. Due to the prevailing poor private investment climate in 2000-2004 and the resultant excess liquidity conditions, the government found domestic borrowing was easy and convenient without exercising any upward pressure on interest rates. The Fiji National Provident Fund, which is statutorily empowered to collect monthly contributions at stipulated percentages of wages and salaries from the employees and employers in the formal sector of the country’s economy, has been the major institution, funding the fiscal deficits to the extent of 70 per cent. In October 2006, the government decided to tap the overseas markets. Encouraged by the country international rating \textit{Ba2} by Moodys and \textit{BB} by Standard and Poors, the government floated a bond issue for US$150 million, which was oversubscribed within a few days. External borrowing by the government was defended on the grounds of further requirements of funds for investing in new capital projects and the need for diversifying

\textsuperscript{2} Fiji, with a per capita income higher than the stipulated threshold per capita income level, is not eligible to borrow on concessional terms (which generally comprise easy terms such as low rate of interest at one percent, known as service charge and a long period of maturity of about 30 to 40 years) from the international funding agencies. Such loans on concessional terms involve more than 25 percent grant element, falling under the description of overseas development assistance or foreign aid. Incidentally Fiji receives the least foreign aid among all Pacific Island countries, which is less than 4 per cent of GDP (Jayaraman and Choong, 2006c).
sources of financing, as it was feared that continuous tapping of the domestic market was likely to crowd out private investment.

In addition to budget deficits, credit expansion, and external debt, we have to consider one more factor while investigating the causes behind pressures on exchange rate. This is with regard to political stability. Episodes of high values in EMP, especially in 1987, which witnessed the first ever military coup and in the post coup years of 1987-1992, and again in 2000 were due to political conditions. Although the economic recovery has been brought about by expansionary fiscal policies to compensate the fall in private investment, the contemplated controversial measures, including the bill for amnesty to the perpetrators of the year 2000 coup and other related steps, continues to contribute to the lingering political uncertainty. It is, therefore, hypothesized that EMP is positively associated with domestic credit, budget deficits, external debt and political uncertainty. Accordingly, we write the relationship as follows:

\[ EMP = f(DCGDP, BUDDEF, UNCINDEX) \]  \hspace{1cm} (4)

where,

- \( DCGDP \) = domestic credit as percentage of GDP;
- \( BUDDEF \) = budget deficit as percentage of GDP
- \( EXTDEBT \) = external debt as percentage of GDP
- \( UNCINDEX \) = uncertainty index

For investigating any possible existence of long-term relationships amongst \( EMP, DCGP, BUDDEF \) and \( UNCINDEX \), we apply the autoregressive distributed lag (ARDL) bounds testing procedure proposed by Pesaran, et al. (2001). The bounds testing procedure has several advantages to its credit, as compared to the Johansen and Juselius multivariate cointegration test. These are: (i) 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); (ii) it is considered more appropriate than the

---

3 For uncertainty index (UNCINDEX), we employed the probit estimation procedure to calculate the estimated frequencies of the probability of a change in and of government. We formed a (0-1) dummy variable for political changes as a starting point for the estimation of a probit model that enabled the calculation of the probabilities. The variables that explained the variations in uncertainty index are real GDP and inflation.

Johansen-Juselius multivariate approach for testing the long run relationship amongst
variables when the data are of a small sample size (Pesaran, et al., 2001); and (iii) ARDL
covers both the long-run and short-run relationships of the variables tested. For these
reasons, the ARDL approach has become increasingly popular in recent years and we
begin the empirical analysis employing with this procedure.

To test the determinants of EMP, the following unrestricted error correction model
(UECM) of the ARDL model is estimated.

\[
\Delta EMP_t = \beta_1 EMP_{t-1} + \beta_2 DCGDP_{t-1} + \beta_3 BUDDEF_{t-1} + \beta_4 EXTDEBT_{t-1} + \beta_5 UNCINDEX_{t-1} + \\
+ \sum_{i=1}^{n_1} \beta_6 \Delta EMP_{t-i} + \sum_{i=0}^{n_2} \beta_7 \Delta DCGDP_{t-i} + \sum_{i=0}^{n_3} \beta_8 \Delta BUDDEF_{t-i} + \sum_{i=0}^{n_4} \beta_9 \Delta EXTDEBT_{t-i} \\
+ \sum_{i=0}^{n_4} \beta_{10} \Delta UNCINDEX_{t-i} + \varepsilon_t
\]

(5)

where \( \varepsilon_t \) is the disturbance term. The null hypothesis of testing the long-run relationship
of this model is \( \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0 \), and the alternative hypothesis is at least
one \( \beta_j \ (j = 1,2,3,4,5) \) does not equal to zero. If the computed \( F \)-statistic of ARDL bound
testing is higher than the upper bound value, we reject the null hypothesis and conclude
that there is a long-run equilibrium relationship among variables. In contrast, if the \( F \)-
statistic is lower than the lower bound value, we cannot reject the null of no long-run
equilibrium relationship among variables. However, if the \( F \)-statistic lies within the upper
bound value and lower bound value, then the results are inconclusive.

Table 5 indicates the estimated results of the ARDL-UECM model based on equation (5).
Since the calculated \( F \)-statistic (54.99) for the equation with EMP as dependent variable
is greater than the critical values provided by Pesaran, et al. (2001) and Narayan (2005)
at 1 per cent significance level, we conclude that there is a long run relationship between
EMP, and domestic credit, budget deficit, external debt and uncertainty index. Since the
\( F \)-statistic for each of the remaining equations is below the upper bound value, we
conclude that there is only one cointegrating equation.
Table 5: Bound Test for Cointegration Analysis

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Computed F-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMP</td>
<td>54.99***</td>
</tr>
<tr>
<td>DCGDP</td>
<td>2.49</td>
</tr>
<tr>
<td>BUDDEF</td>
<td>2.99</td>
</tr>
<tr>
<td>EXTDEBT</td>
<td>1.69</td>
</tr>
</tbody>
</table>

**Pesaran et al. (2001)a**  **Narayan (2005)b**

<table>
<thead>
<tr>
<th>Critical Value</th>
<th>Lower bound value</th>
<th>Upper bound value</th>
<th>Lower bound value</th>
<th>Upper bound value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 per cent</td>
<td>3.41</td>
<td>4.68</td>
<td>4.54</td>
<td>6.37</td>
</tr>
<tr>
<td>5 per cent</td>
<td>2.62</td>
<td>3.79</td>
<td>3.13</td>
<td>4.44</td>
</tr>
<tr>
<td>10 per cent</td>
<td>2.26</td>
<td>3.35</td>
<td>2.58</td>
<td>3.86</td>
</tr>
</tbody>
</table>

a Critical values are obtained from Pesaran et al. (2001), Table CI(iii) Case III: Unrestricted intercept and no trend, p. 300.
b Critical values are obtained from Narayan (2005), Table case III: unrestricted intercept and no trend, p. 1988.

*** indicates significance at 1% level.

The long run equation is given as follows:

\[
EMP = -12.98 + 1.96DCGDP^{***} + 9.37BUDDEF^{***} + 0.02EXTDEBT^{***} + 0.58UNCIINDEX^{*}
\]

\[(-6.47) \quad (4.88) \quad (2.74) \quad (3.20) \quad (2.26)
\]

Note: *, ** and *** indicate significance at 10, 5 and 1 per cent levels. Figures in parentheses are calculated “t” values.

In Equation (6), it is found that the signs of the explanatory variables are in accordance with theoretical expectations, confirming their hypothesized positive association with EMP. Further, the estimated coefficients are found statistically significant. The goodness of fit of the estimated model is reflected in the high adjusted R-squared (0.9794). Further, the diagnostic tests including Jarque-Bera normality test, Breusch-Godfrey Serial Correlation LM Test, ARCH Test and Ramsey’s misspecification Test show that the estimated Equation (6) is acceptable (Table 6). Tests on the stability of the model in terms of CUSUM test and CUSUM of square test (Figures 2 and 3) confirm that the model is stable over the sample period.
Table 6: Diagnostic Tests

<table>
<thead>
<tr>
<th>Diagnostic Test</th>
<th>Null Hypothesis</th>
<th>Equation (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jarque-Bera test</td>
<td>$H_0$: Normality of error term</td>
<td>$\chi^2 = 4.1364 \ [0.1264]$</td>
</tr>
<tr>
<td>Breusch-Godfrey Serial Correlation</td>
<td>$H_0$: No autocorrelation</td>
<td>$F(1) = 4.3331 \ [0.1058]$</td>
</tr>
<tr>
<td>LM Test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARCH Test</td>
<td>$H_0$: Homoskedasticity</td>
<td>$F(1) = 1.0514 \ [0.3158]$</td>
</tr>
<tr>
<td>Ramsey RESET Test</td>
<td>$H_0$: The model is correctly specified</td>
<td>$F(1) = 2.1232 \ [0.2188]$</td>
</tr>
</tbody>
</table>

Note: Figures in square brackets are probability values of the test statistics. Figures in parentheses are the lag lengths used for the appropriate diagnostic tests.

Figure 2: Plot of CUSUM Test

![CUSUM Test Plot](image-url)
In the estimated Equation (6) we observe that budget deficit has the greatest impact (9.37) on EMP, followed by domestic credit, political instability and external with magnitudes of 1.96, 0.58 and 0.02, respectively.

Long-run and short-run causality linkages

The confirmation of existence of a long run relationship between EMP with its macroeconomic determinants in Equation (6) indicates that there must be Granger causality at least in one direction. In order to examine the short-run causality relationship between these variables, Granger causality tests are conducted and reported in Table 7. The results indicate that the error correction term with the required negative sign is significant in EMP equation at 5 percent in Table 7. The ECT term is not significant in any other equation. Adjustment towards the long run equilibrium is 94.68 percent suggesting that any deviation from the long run equilibrium is corrected substantially in the following year. These findings establish the presence of a long-run relationship between EMP, domestic credit, budget deficit, external debt and uncertainty index. The results also show the existence of bi-directional causality between EMP and external debt.
Table 7: Granger Causality Tests

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>F-statistic</th>
<th>ECT (t-statistics)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ΔEMP</td>
<td>ΔDCGDP</td>
</tr>
<tr>
<td>ΔEMP</td>
<td>-</td>
<td>1.48</td>
</tr>
<tr>
<td>ΔDCGDP</td>
<td>0.81</td>
<td>-</td>
</tr>
<tr>
<td>ΔBUDDEF</td>
<td>1.10</td>
<td>1.29</td>
</tr>
<tr>
<td>ΔEXTDEBT</td>
<td>3.57*</td>
<td>3.36*</td>
</tr>
</tbody>
</table>

Note: *, ** and *** indicate significance at 10%, 5% and 1% levels, respectively. Figures in parentheses are calculated t-statistics.

IV. Conclusions

This paper undertook an empirical investigation of the causes behind exchange market pressures experienced by Fiji during a 31-year period (1975-2005). Utilizing the calculation procedure appropriate for a fixed exchange rate regime, the pressures on exchange rate were estimated. An autoregressive distributed lag (ARDL) bounds testing procedure, which was employed for the econometric analysis, established that exchange market pressures were directly influenced by budget deficits, credit expansion and external debt as well uncertain political conditions.

The policy implications are straightforward. Mounting pressures on exchange rate, if left uncontrolled in a fixed exchange rate regime, would only fan fears of devaluation, which will give rise to speculative attacks on currency. Devaluation of the currency would then be a self-fulfilling prophecy. The government should, therefore, do well to take appropriate timely steps to rein in public sector expenditures and control growth in domestic credit. Above all, conditions of any political uncertainty need urgent attention. Fiji has been fortunate in keeping inflation under check by linking its exchange rate to the basket of currencies of its major trading partners, whose central banks have been targeting inflation. Fiji cannot afford to lose the gains of a fixed regime enjoyed over the past decade, all of a sudden, by unwise policies amounting to fiscal indiscipline and lack of attention to maintenance of political stability.
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