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## Foreign Direct Investment and Employment Creation in Pacific Island Countries: An empirical study of Fiji

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## *Executive Summary*

Among the 14 Pacific island countries (PICs), Fiji, with its relatively better endowments in land and human resources as well as physical infrastructure, has been one of the ten favourite destinations of foreign direct investment (FDI) in Asia-Pacific. Past studies confirm that FDI contributed to economic growth of Fiji. Firstly, it added to domestic savings and reduced the resource gaps and cushioned them against possible adverse effects of current account deficits. Secondly, it enabled Fiji to step up its export-related activities by specifically focusing on resource development, employment creation and skills development. Soon after the two military coups of 1987, Fiji, which was isolated by bilateral donors in the region, was forced to explore and develop new areas of growth such as the export oriented garment industry with FDI from East Asia. The gains from FDI include not only creation of employment in those sectors, which attracted overseas investors, but also of additional employment opportunities in ancillary sectors, which are supportive to all production oriented activities in the economy.

This paper undertakes an econometric study of the impact of FDI in Fiji during a 30-year period. In the absence of data on Fiji's employment in FDI sectors either in aggregated form or by specific sectors, we are constrained to use data on formal sector employment as a proxy. This implies that employment in both formal and FDI related activities move in the same direction and proportion. The paper investigated the relationship between employment and foreign direct investment for Fiji through a multivariate modeling strategy by including GDP. We found unidirectional long run causality running from foreign direct investment to employment and a unidirectional causality running from foreign direct investment to GDP in the short-run.

The policy implications of the study are that Fiji should continue not only its current proactive policies to attract FDI inflows but also maintain appropriate environment including political stability for retaining the inflows. Past negative net inflows in the immediate years after the two coups of 1987 and in 2000 were clearly due to poor domestic investor confidence. Further, with a view to improve the employment database especially in regard to FDI related activities, we suggest that the Fiji Trade and Investment Bureau (FTIB), which is the screening and appraising authority, should stipulate while approving the FDI proposal that overseas investors should file returns on employment in their ventures in regard to employment by categories of skilled and unskilled; by levels such as plant, supervisory and managerial; by local and foreigners; and by gender. Further, FTIB should be entrusted with the responsibility for collecting the data. Enabling legislative amendments should be introduced in the FTIB Act towards these purposes. Improved data collection will go a long way to assess the impact of FDI.

## *Introduction*

A large body of empirical literature on foreign direct investment (FDI) in developing countries in various regions, including the Asia-Pacific region has shown that FDI's social and distributional impact on the host country has been generally favourable (Hill and Athukorala 1998, Sun 1998, Sun 1996, Jansen 1995, Athukorala and Menon, 1995, Schive 1990). Aside from bringing in a package of highly productive resources into the host economy, which include production know-how and process technology, managerial skills, improvements in accounting and auditing standards and information on international markets, there have been noticeable creation of jobs not only in those sectors attracting FDI inflows but also in the supportive domestic industries.

A recent study by Asian Development Bank (2004) emphasizes the need for appropriate policies for regional development, besides the importance of flexibility in labour markets, for exploiting the forward and backward linkages provided by FDI. Such policies have been found to ensure the spatial distribution of benefits in terms of additional job creation in hinterland. Malaysia and Thailand, which attracted FDI inflows into their export-oriented, labour intensive and natural resource based industries including palm and rubber plantations enjoyed periods of nation-wide prosperity triggered by frequent booms in world commodity prices (Hill and Athukorala 1998), in the process conferring benefits on the hinterlands as a consequence of balanced regional development policies.

Our paper focuses on the Pacific island countries (PICs)<sup>1</sup>. The objective of this paper is to undertake an empirical study on creation of employment opportunities by FDI in Fiji. The choice of Fiji, as case study, is dictated mainly by data constraints relating to availability of reliable time series of a longer period compared to other PICs. In the context of regional integration envisaged under the Pacific Plan<sup>2</sup>, which was endorsed in 2005 by the regional organisation known as Pacific Islands Forum<sup>3</sup>, FDI inflows have assumed great importance for future economic growth in the region. A single market economy (SME) of about 7.5 million population brought about by an economic union of

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<sup>1</sup> The 14 Pacific island countries are: Cook Islands, Fiji, Kiribati, Republic of Marshall Islands, Federated States of Micronesia, Nauru, Niue, Palau, Papua New Guinea (PNG), Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu.

<sup>2</sup> The Pacific Plan, endorsed by the 14 PIC leaders in October 2005 is based upon four pillars of (i) economic growth; (ii) sustainable development; (ii) good governance and (iv) security. One of the major initiatives undertaken by PICs was the signing of the Pacific Island Countries Trade Agreement (PICTA) signed in 2002 with the objective of ushering in a free trade area by 2010 (Jayaraman 2005).

<sup>3</sup> The Pacific Islands Forum comprises 14 Pacific island countries, namely Cook Islands, Fiji, Kiribati, Republic of Marshall Islands, Federated States of Micronesia, Nauru, Niue, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu and the region's two developed countries, namely Australia and New Zealand. Australia, the biggest aid giver to the PICs, bears nearly 80 percent of the operating costs of the Forum as well.

PICs, is expected to offer much greater incentives for overseas investors than at present. An SME is more likely to attract FDI inflows for investment in consumer goods industries for exports to the regional market since such a large economic space assures the investors of unhindered trade in their products between all PICs. The paper is organised on the following lines: in section 2, trends in FDI and employment in Fiji are reviewed; section 3 deals with the data and methodology adopted for the empirical study, while section 4 presents the results of the study; and the final section 6 lists some conclusions with policy implications.

### *Trends in FDI and Employment in Fiji*

Among PICs, Fiji, Solomon Islands and Vanuatu have been attractive countries for FDI for past two decades. All the three PICs were among the top 10 destinations for FDI in developing Asia-Pacific region (Table 1). The PICs have become increasingly appreciative of the fact that in the light of declining external aid, it would be prudent to place greater emphasis on FDI inflows, which have been acknowledged to be the most constructive of all capital inflows for the emerging markets. FDI inflows as non-debt creating flows, not only supplement domestic savings, but also contribute to fostering domestic managerial skills and transfer of technology (Jayaraman 1998). In terms of contribution to gross capital formation, FDI's share has been substantial (Table 2). Further, they are less volatile and less prone to sudden withdrawal due to shift in sentiment (Jayaraman and Choong 2006).

**Table 1: Top 10 Destinations for FDI in Developing Asia: 1991-1993 and 1998-2000  
( Average Inflows per capita in US\$)**

1991-1993			1998-2000		
Rank	Country	US\$	Rank	Country	US\$
1	Singapore	1,234	1	Hong Kong	5,006
2	Hong Kong	667	2	Singapore	2,826
3	Malaysia	264	3	Korea	172
4	Vanuatu	164	4	Malaysia	154
5	Fiji Islands	104	5	Taipei, China	121
6	Solomon Islands	51	6	Vanuatu	94
7	Taipei China	49	7	Thailand	94
8	Kazakhstan	42	8	Kazakhstan	87
9	Thailand	36	9	Azerbaijan	71
10	Maldives	29	10	Fiji Islands	63

Source: Asian Development Bank (2006)

**Table 2: FDI as % of Gross Capital Formation in Top 10 FDI Destinations in Asia-Pacific Region**

1991-1993			1998-2000		
Rank	Country	%	Rank	Country	%
1	Vanuatu	53.1	1	Hong Kong	75.7
2	Fiji Islands	38.7	2	Cambodia	45.3
3	Vietnam	32	3	Kazakhstan	42.7
4	Solomon Islands	26.5	4	Singapore	39.3
5	Singapore	23.1	5	Azerbaijan	38.9
6	Malaysia	22.8	6	PNG	36.5
7	Cambodia	17.9	7	Vanuatu	28.2
8	Kyrgyz Republic	15.2	8	Kyrgyz Rep.	24.4
9	Hong Kong	13.2	9	Thailand	22.1
10	PNG	12.1	10	Vietnam	19.7

Source: Asian Development Bank (2006)

### Past trends

The term FDI would normally refer to substantial equity stake and effective control of enterprises. However, in the context of growing services sector in developing countries, a broader definition seems to have been emerging. This now refers to non-equity participation by foreigners by way of licensing, franchising, joint ventures with limited equity participation and R&D cooperation (de Mello 1997). Historical ties with the United Kingdom, Australia and New Zealand have largely influenced FDI flows to PICs in some specific areas.

Most of the FDI inflows to PICs in the past were primarily of the natural resource exploiting type: the former Australian-owned Colonial Sugar Refinery (CSR), a plantation venture in the 19<sup>th</sup> century becoming a successful export oriented investment and resort hotels; palm oil and cocoa plantations in the Solomon islands in the 1960s owned by British interests, and tuna fisheries and canning by Japanese investors in the 1980s and the cattle ranches on Santo island of Vanuatu, supplying beef exports to Japan and Europe. These natural resource based FDI inflows were later on followed in the 1980s by FDI in export-oriented, labour intensive garments and other industries due to deliberate policies (Jayaraman and Choong 2005, Gani 1999). Aside from agriculture-based industries, the sun-sea-surf linked tourism activities induced in recent years substantial FDI inflows from well-known international resort-hotel chains.

The third type of investment, known as market seeking, was mainly limited to retail trade, as the populations of PICs were small. These included retailers including Burns Philp and Carpenters of Australia, which set up supermarket chains. In the early 1990s, Japanese investors showed interest in setting up export-oriented type of investments in light industries. The Yazaki automobile wiring harness plant in Samoa is a leading example, which exported its products to car assembling plants in Japan and Australia. The newly industrialised countries such as Korea, Malaysia and Singapore also entered the scene. Their interests were confined to the services sector.

Table 3 provides FDI flows to Fiji in US million dollars during the recent period (1985-2002) as well as in percent of GNP. The stock of FDI in 2002 is reported to be US\$1,211 million, which is around 66% of GNP (United Nations Conference Trade and Development 2006). The FDI flows were highly susceptible to political conditions as evidenced by their decline soon after the 1987 and 2000 coups.

**Table 3: FDI Inflows to Fiji : 1985-2002**  
(US\$ Million and % of GNP)

Year	Net FDI Flows (US\$ Million)	Net FDI Flows (% of GNP)	Year	Net FDI Flows (US\$ Million)	Net FDI Flows (% of GNP)
1985	21.8	2.0	1994	67.5	3.8
1986	8.0	0.6	1995	69.5	3.7
1987	-10.8	-1.0	1996	2.4	0.1
1988	23.5	2.2	1997	15.6	0.8
1989	13.1	1.0	1998	107.0	7.0
1990	92.0	6.8	1999	-33.2	-1.9
1991	5.2	0.4	2000	-69.3	-3.0
1992	103.6	6.6	2001	95.3	2.4
1993	91.2	5.7	2002	51.5	1.5

Source: World Bank (2006a)

Available studies show that FDI has contributed to economic growth of Fiji (Gani 1999, Jayaraman and Choong 2006). First and foremost, it has added to domestic savings in all countries and reduced the resource gaps and cushioned them against possible adverse effects of current account deficits (Jayaraman 1998). Secondly, it enabled PICs to step up its export-related activities by specifically focusing on resource development, employment creation and skills development (Parry 1988). With additional incentives soon after the two military coups of 1987, which led to a temporary period of political and economic isolation resulting in the suspension of bilateral support from the metropolitan governments in the region, Fiji was able to explore and develop new areas of growth such as the export oriented garment industry with FDI from East Asia (Eleck *et al.* 1993).

### Trends in employment

On the basis of definition relating to reference population (15 years and older), Fiji's labour force is estimated at 332,000 in 2005, which is about 39 percent of total population of 848, 000 (Asian Development Bank 2005, International Labour Organisation 2003). The labour force is expected to rise to 368,000 in 2015, and 395,000 in 2030. About 41,000 were reported to be unemployed, which constitutes 12 percent of the labour force.

**Table 4: Selected South Pacific Islands: Labor Force Estimates**

<b>Country</b>	<b>2003</b> <b>(‘000)</b>	<b>2015</b> <b>(‘000)</b>	<b>2030</b> <b>(‘000)</b>
Fiji Islands	332	368	395
Papua and New Guinea	2,641	3,476	4,562
Solomon Islands	237	318	448
Tonga	36	40	39

Source: Asian Development Bank (2004), International Labor Organization (2003)

**Table 5: Selected South Pacific Islands: Estimates of Unemployment in 2003**

<b>Country</b>	<b>Unemployment Rate</b> <b>(%)</b>	<b>Unemployed (‘000) (%)</b>
Fiji Islands	12.1	41
Kiribati	2	1
Republic of Marshall Islands	30	5
Federate States of Micronesia	2.6	1
Palau	2.3	224

Source: Asian Development Bank (2005)

Rapid rise in employment was recorded after 1989, when the interim government soon after the military coups took steps to deregulate the economy and introduced far-reaching liberalisation measures. In the years between 1989 and 1995, on average, the increase in employment was about 3.77 percent. Such huge increase in the employment was attributed to export promotion policies implemented by the government. Since 1989 the textile, clothing and footwear (TFC) industry, which was mainly geared to supplying garments to export markets, contributed to increases in the formal sector employment. In 1989, a 133 percent increase in the employment was experienced in TCF industry, which emerged as a major contributor to the Fiji economy, besides sugar and tourism. Fiji’s TCF industry rapid development over the 1990’s has been due to several favourable factors. The latter include preferential treatment for entry to various markets, the country’s relatively low labour cost, offer of an attractive package of fiscal incentives and the gradual contraction of the industry in neighboring countries namely, Australia and New Zealand.

It is also worth mentioning that TCF industry was a major employer of female workers, generally ones with low literacy levels. The high female employment share (around 80 %) is a significant feature of the TCF industry. This compares to some 33% of females in the manufacturing sector overall and 30% of total employment in Fiji. Indeed, it is the garment industry that has largely been responsible for the increasing share of female employment. The majority of the female workers were from the sugar cane growing families in the western parts of the country, where the once dominant sugar industry has been on a steady decline thereby causing distress to a large segment of the farming population. The TCF industry, thus, provided the much needed supplementary



income to family units. The other major increase was experienced in the wholesale and the retail sector, which was around 15% in 1989. Table 6 provides data on total employment.

**Table 6 : Formal Sector Employment in Fiji (1985-2002)**

Year	Manufacturing	Wholesale and retail	Total
1985	13,696	14,055	77,343
1986	13,973	14,100	79,854
1987	13,680	12,024	78,158
1988	14,040	11,864	77,529
1989	19,666	14,330	89,876
1990	21,051	14,849	92,107
1991	23,400	14,536	91,538
1992	21,181	13,622	92,480
1993	24,882	17,880	103,664
1994	24,500	17,900	103,500
1995	26,200	17,800	105,500
1996	24,635	20,719	110,070
1997	27,039	20,888	112,932
1998	29,200	21,025	112,519
1999	29,202	20,337	111,133
2000	29,100	20,200	110,500
2001	30,200	21,100	115,000
2002	31,000	21,600	118,000

Source : Fiji Islands Bureau of Statistics (2006)

## *Data, Modeling and Methodology*

The estimation procedure of the empirical study, which covers a 34-year period (1970-2003), is constrained by data inadequacies<sup>4</sup>. Since the employment data in industries receiving FDI inflows, such as garment manufacturing are available only for a

<sup>4</sup> The paucity of data in Pacific island countries has been posing considerable difficulties for researchers, both in academic and official agencies. Besides the general problem of data inadequacies, frequent revisions and *ad hoc* adjustments have also cast serious doubts about the quality of available data (Gosaraevski 2004, Hughes 2003, Morling and Williams 2000)

limited period, we do not have a longer time series needed for meaningful econometric analysis. The available employment data relate to the formal sector as a whole, covering the traditional formal sectors including central and local governments and public sector agencies as well as FDI-related industries. In the absence of data on Fiji's employment in FDI sectors either in aggregated form or by specific sectors, we are thus constrained to use data on formal sector employment as a proxy. This implies that employment in both formal and FDI related activities move in the same direction and proportion.

## Data

As noted by a recent study (Asian Development Bank 2004), accurate estimates of FDI stock are rarely available in the Asia-Pacific region. One has to depend upon the FDI net inflow data, despite the fact that they are poorly recorded. Investment agencies in developing countries typically report approved investments, which often significantly differ from actual flows, as realization rates vary and they might lag behind several years. Further, FDI net inflows data are mostly in aggregated form, without specifying the type of FDI. Disaggregated flow data, wherever available by sector and source, are mostly incomplete. Furthermore, attempts to match source and host FDI estimates typically reveal large discrepancies (Asian Development Bank 2004: 264). Fiji is no exception.

Our study uses the available data, which are in the form of aggregated FDI net inflows on a consistent basis. While time series data on GDP and formal sector employment covering a 34-year period (1970-2003) were obtained from the official publications *Current Economic Statistics* and *Annual Employment Survey* (Fiji Islands Bureau of Statistics Year), the source for the data on FDI net inflows is the annual publication, *World Development Indicators* (2006) of the World Bank (2006b).

## Modeling and methodology

We hypothesize that annual employment is positively associated with annual FDI inflows. Since annual employment is also dependent on economic growth, we also hypothesize that employment in FDI activities is also directly influenced by gross domestic product (GDP). The latter represents all round growth of the economy, which is dominated by investment activities funded domestic sources, both private and public sectors. Based on these premises, we now proceed to model the relationship. While employment is expressed in numbers, FDI net inflows and GDP are in constant Fiji dollars.

To search for possible long run relationships amongst real GDP ( $Y$ ), real foreign direct investment net inflows (FDI) and formal sector employment in numbers ( $L$ ), we employ the bounds testing approach to cointegration, which has become increasingly

popular in recent years<sup>5</sup>. This involves estimating the following unrestricted error correction model (UECM):

$$\begin{aligned} \Delta Y_t = & a_{oY} + \sum_{i=1}^n b_{iY} \Delta Y_{t-i} + \sum_{i=1}^n c_{iY} \Delta FDI_{t-i} + \sum_{i=1}^n d_{iY} \Delta L_{t-i} \\ & + \sigma_{1Y} Y_{t-1} + \sigma_{2Y} FDI_{t-1} + \sigma_{3Y} L_{t-1} + \varepsilon_{1t} \end{aligned} \quad (1)$$

$$\begin{aligned} \Delta FDI_t = & a_{oFDI} + \sum_{i=1}^n b_{iFDI} \Delta FDI_{t-i} + \sum_{i=1}^n c_{iFDI} \Delta Y_{t-i} + \sum_{i=1}^n d_{iFDI} \Delta L_{t-i} \\ & + \varpi_{1FDI} FDI_{t-1} + \varpi_{2FDI} Y_{t-1} + \varpi_{3FDI} L_{t-1} + \varepsilon_{1t} \end{aligned} \quad (2)$$

$$\begin{aligned} \Delta L_t = & a_{oL} + \sum_{i=1}^n b_{iL} \Delta L_{t-i} + \sum_{i=1}^n c_{iL} \Delta Y_{t-i} + \sum_{i=1}^n d_{iL} \Delta FDI_{t-i} \\ & + \theta_{1L} L_{t-1} + \theta_{2L} Y_{t-1} + \theta_{3L} FDI_{t-1} + \varepsilon_{1t} \end{aligned} \quad (3)$$

Here  $\Delta$  is the first difference operator. The  $F$  test is used to determine whether a long-run relationship exists between the variables through testing the significance of the lagged levels of the variables. When a long-run relationship exists between the variables, the  $F$  test indicates which variable should be normalised.

The null hypothesis of no cointegration amongst the variables in equation 1 is  $(H_0 : \sigma_{1Y} = \sigma_{2Y} = \sigma_{3Y} = 0)$  against the alternative hypothesis  $(H_1 : \sigma_{1Y} \neq \sigma_{2Y} \neq \sigma_{3Y} \neq 0)$ . This is denoted as  $F_Y(Y|FDI, L)$ . In equation 2, where FDI is the dependent variable, the null hypothesis for no cointegration is  $(H_0 : \varpi_{1FDI} = \varpi_{2FDI} = \varpi_{3FDI} = 0)$  against the alternative  $(H_1 = \varpi_{1FDI} \neq \varpi_{2FDI} \neq \varpi_{3FDI} \neq 0)$ . This is denoted as  $F_{FDI}(FDI|Y, L)$ . In equation 3, where formal sector employment is the dependent variable, the null hypothesis for no cointegration is  $(H_0 : \theta_{1L} = \theta_{2L} = \theta_{3L} = 0)$  against the alternative  $(H_1 : \theta_{1L} \neq \theta_{2L} \neq \theta_{3L} \neq 0)$ . This is denoted as  $F_L(L|Y, FDI)$ .

The  $F$  test has a non-standard distribution which depends upon; (i) whether variables included in the ARDL model are  $I(0)$  or  $I(1)$ ; (ii) the number of regressors; (iii) whether the ARDL model contains an intercept and/or a trend; and (iv) the sample size. Two sets of critical values (CVs) are reported in Narayan (2005) for sample sizes ranging from 30 observations to 80 observations. Given the relatively small sample size in the present study, we extract appropriate CVs from Narayan (2005).

<sup>5</sup> Some of the notable recent empirical studies, which utilized the bounds testing approach include (i) Atkins and Coe (2002), Bahmani-Oskooee and Ng (2002), Bahmani-Oskooee and Goswami (2003), Narayan and Smyth (2005a) and Vita and Abbott (2002).

## Granger Causality

If we do not find any evidence for cointegration among the variables, the specification of the Granger causality test will be a Vector Autoregression (VAR) in first difference form. However, if we find evidence for cointegration then we need to augment the Granger-type causality test model with a one period lagged error correction term. This is an important step because Engle and Granger (1987) caution that if the series are integrated of order one, VAR estimation in first differences will be misleading.

$$\begin{aligned} \Delta Y_t = & \nu + \sum_{i=1}^p \vartheta_i \Delta Y_{t-i} + \sum_{i=1}^p \kappa_i \Delta FDI_{t-i} + \sum_{i=1}^p \phi_i \Delta L_{t-i} \\ & + \pi_1 ECT_{t-1} + \varepsilon_{1t} \end{aligned} \quad (4)$$

$$\begin{aligned} \Delta FDI_t = & \nu + \sum_{i=1}^{p-1} \kappa_i \Delta FDI_{t-i} + \sum_{i=1}^{p-1} \vartheta_i \Delta L_{t-i} + \sum_{i=1}^p \phi_i \Delta Y_{t-i} \\ & + \pi_2 ECT_{t-1} + \varepsilon_{2t} \end{aligned} \quad (5)$$

$$\begin{aligned} \Delta L_t = & \nu + \sum_{i=1}^{p-1} \phi_i \Delta L_{t-i} + \sum_{i=1}^{p-1} \vartheta_i \Delta FDI_{t-i} + \sum_{i=1}^p \kappa_i \Delta Y_{t-i} \\ & + \pi_3 ECT_{t-1} + \varepsilon_{3t} \end{aligned} \quad (6)$$

In addition to the variables defined above,  $ECT_{t-1}$  is the lagged error-correction term derived from the long-run cointegrating relationship and  $\varepsilon_{1t}$ ,  $\varepsilon_{2t}$  and  $\varepsilon_{3t}$  are serially independent random errors with mean zero and finite covariance matrix. In each case the dependent variable is regressed against past values of itself and past values of other variables. The optimal lag length  $p$  in equations (4) to (6) are selected using the Schwarz Bayesian Criterion. Letting  $M_1 = (\kappa_1 + \dots + \kappa_p)$ ,  $M_2 = (\vartheta_1 + \dots + \vartheta_p)$  and  $M_3 = (\phi_1 + \dots + \phi_p)$ , the short-run causality test is carried out by generating  $\chi^2$  statistics to establish whether the null hypotheses can be accepted or rejected. For equation (4) this amounts to  $H_0 : M_1 = 0$  and  $M_3 = 0$ ; for equation (5) it is  $H_0 : M_2 = 0$  and  $M_3 = 0$ ; and for equation (6) it is  $H_0 : M_1 = 0$  and  $M_2 = 0$ .

## *Empirical results*

### Unit root test

Our first step was to investigate the unit root properties of the data series. Although it is recognised that the knowledge on the integrational properties is not required for the application of the bounds test, it is a crucial step in ensuring that we obtain an unbiased estimation from the Granger causality tests. To obtain the integration properties of the data series, we apply the ADF test, which tests the null hypothesis of nonstationarity. The computed ADF test statistics for Y, FDI and L are -0.59, 1.96 and -1.16, respectively, while the 5 per cent level critical value is -2.98, -3.6 and 2.95. The computed ADF test statistics for the first difference of Y, FDI and L are -3.37, -3.50 and -5.30, respectively, leading us to conclude that all the three variables are integrated of order one or I(1).

### Cointegration

Our next aim is to investigate whether Y, FDI and L share common long-run relationships. To achieve this, as explained earlier, we test for the presence of long-run relationships in Equations (1)-(3). Before we proceed to calculating the F-test statistic, an important step is to establish the optimal lag length to be used in the cointegration analysis. Using the Schwarz Bayesian Criterion, we find that 1 lag is optimal for this exercise. We find that there is a long run relationship amongst the variables in those equations, when Y and L are respectively the dependent variables, because the relevant F-statistic's, which turns out to be 5.59 and 4.36 respectively, is higher than the upper bound critical value of 3.62 at the 10 per cent level of significance<sup>6</sup> (Table 7). This implies that the null hypothesis of no cointegration among the variables in Equations (1 and 3) cannot be accepted, while for Equation (2), the null hypothesis is accepted.

**Table 7 : Tests for Cointegration**

<i>F</i> -statistics	10% critical value bounds
	I(1)
$F_Y(Y FDI, L) = 5.5916$	3.623
$F_{FDI}(FDI Y, L) = 3.5052$	
$F_L(L FDI, Y) = 4.3692$	

Source: Authors' calculations

<sup>6</sup> Considering the nature and quality of data, our choice of significance level has been constrained to be at 10 percent

## Long-run estimates

Having found the existence of a long run relationship in the Equation with  $L$  as dependent variable and  $FDI$  and  $GDP$ , as explanatory variables, we now proceed to estimate the long run marginal effect. In other words, we investigate the impact of foreign direct investment and  $GDP$  on formal sector employment for Fiji. Towards this purpose, we use the autoregressive distributed lag model (ARDL). The ARDL estimators reveal that  $FDI$  has a positive impact on formal sector employment for Fiji; this result is statistically significant at the 5 per cent level.

$$L = 67165.70 + 12.68Y_t + 1.006FDI_t + \varepsilon_t$$

(3304.20)\*\*\* (0.81)\*\*\* (1.006)\*\*\*

(The figures in the parentheses denote standard errors).

\*\*\* significant at 1 % level

Based on the results of estimated equations, elasticity estimates for employment with respect to  $FDI$  and  $Y$  were calculated at their means. An increase by 1 percent in  $FDI$  would give rise to additional employment by 0.017 percent. In regard to relationship between  $Y$  and  $L$ , one percent increase in  $Y$  would lead to an increase in labour formal sector employment by 0.26 percent (Table 8).

**Table 8. Long run Elasticities**

	$Y_t$	$FDI_t$
ARDL	0.26	0.017

Source: Authors' calculations

## Granger Causality

Existence of a cointegrating relationship among  $L$ ,  $FDI$  and  $Y$  suggests that there must be Granger causality in at least one direction, but it does not indicate the direction of temporal causality between the variables. We now proceed to examine both short-and long-run Granger causality linkages (Table 9). The short-run causal effects can be obtained by the F-statistics of the lagged explanatory variables, while the  $t$ -ratio of the coefficient of the lagged error-correction term would indicate the significance of the long-run causal effect.

**Table 9: Tests for Granger Causality**

F- tests $\chi^2(2)$				
Dependent variable	$\Delta FDI_t$	$\Delta Y_t$	$\Delta L_t$	ECT <sub>t-1</sub> [t-statistics]
$\Delta FDI_t$	-	4.2039 (+) [0.1222]	3.1712 (+) [0.2048]	-
$\Delta Y_t$	15.5656*** (+) [0.0004]	-	1.5811 (+) [0.4536]	-
$\Delta L_t$	0.5675 (+) [0.7529]	0.2777 (+) [0.8703]	-	-3.4*** (0.002)-

\*\*\* significant at 1% level

Source: Authors' calculations

Beginning with short-run effects, we find that both Y and FDI are not significant in the equation with L as dependent variable (Table 9). This implies that both FDI and Y do not Granger cause L in the short-run. In the Y equation, L is found statistically not significant, while FDI is found statistically significant at 1% level implying only FDI Granger causes Y in the short-run. In the FDI equation, while both L and Y turn out to be statistically not significant at the 5 per cent level. Turning to the long-run Granger causality results, we find that the coefficient of the lagged error correction term in the equation with L as the dependent variable is significant with the correct sign at the 1 per cent level, implying that the changes in L are a function of disequilibrium in the cointegrating relationship. This confirms the results from the bounds test for cointegration. Thus, in the long run both Y and FDI Granger cause L, meaning that the linkage runs interactively through the error correction term from foreign direct investment and GDP to employment.

## *Conclusions and Recommendations*

The paper investigated the relationship between employment and foreign direct investment for Fiji through a multivariate modeling strategy by including GDP. We proceeded in four steps. First, we subjected the data series –real GDP, real foreign direct investment net inflows and employment – to ADF tests in order to ascertain the nature of stationarity properties of the variables. The ADF tests revealed that all variables were integrated of order one. In the second step, we undertook a search for possible long run relationships among the variables by using the bounds testing approach to cointegration. We found that there were two cointegration relationships among the variables when formal sector employment and GDP were the endogenous variables. This finding paved the way for estimating marginal effect on the impact of foreign direct investment and GDP on employment, which we investigated in the third step. The ARDL estimator revealed that both GDP and foreign direct investment did have positive and statistically significant impacts on Fiji's employment. In the fourth step, we investigated the direction of causation among the variables using the Granger causality testing procedure. We found unidirectional long run causality running from foreign direct investment to employment and a unidirectional causality running from foreign direct investment to GDP in the short-run.

Based on the findings of the study, we recommend that Fiji should continue not only its current proactive policies to attract FDI inflows but also maintain appropriate environment including political stability for retaining the inflows. Past negative net inflows in the immediate years after the two coups of 1987 and in 2000 were clearly due to poor investor confidence. Further, with a view to improve the employment database especially in regard to FDI related activities, we suggest that the Fiji Trade and Investment Bureau (FTIB), which is the screening and appraising authority, should stipulate while approving the FDI proposal that overseas investors should file returns on employment in their ventures in regard to employment by categories of skilled and unskilled; by levels such as plant, supervisory and managerial; by local and foreigners; and by gender. Further, FTIB should be entrusted with the responsibility for collecting the data. Enabling legislative amendments should be introduced in the FTIB Act towards these purposes. Improved data collection will go a long way to assess the impact of FDI.



## *References*

- Asian Development Bank (ADB), 2005. “Special Chapter on Labour Markets in Asia: Promoting Full, Productive and Decent Full Employment”, *Key Indicators 2005*, Manila; ADB.
- ADB (2004). “Foreign Direct Investment in Developing Asia”, Part 1, *Asian Development Outlook, 2004*, , Manila; ADB.
- Athukorala, P. and J.Menon (1005). Developing with Foreign Investment in Malaysia”, *The Australian Economic Review*, Ist Quarter, 9-22.
- Atkins, F.J. and Coe, P.J. (2002). “An ARDL Bounds Test of the Long-Run Fisher Effect in the United States and Canada”, *Journal of Macroeconomics*, 24, 255-266.
- Bahmani-Oskooee, M. and Goswami, G.G., (2003). “A Disaggregated Approach to Test the J-Curve Phenomenon: Taiwan Versus Her Major Trading Partners”, *Journal of Economics and Finance*, 27, 102-113.
- Bahmani-Oskooee, M. and Ng, R. (2002). “Long-Run Demand for Money in Hong Kong: An Application of the ARDL Model”, *International Journal of Business and Economics*, 1, 147-155.
- De Mello, Jr., L.R., (1997) “Foreign Direct Investment in Developing Countries: A Selective Survey”, *The Journal of Development Studies*, 34 (1): 1-34.
- Elek, A., H. Hill, and Tabor, S., (1993). “Liberalization and Diversification in a Small Island Economy: Fiji since the 1987 Coups”, *World Development*, 21(5): 749-769.
- Engel, R.F. and Granger, C. W. J., (1987) Cointegration and Error Correction Representation, Estimation and Testing. *Econometrica*, 55, 251-276.
- Fiji Islands Bureau of Statistics (2006). *Current Economic Statistics*, Suva: Government of Fiji Press.
- Fiji Islands Bureau of Statistics (2006). *Annual Employment Survey*, Suva: Government of Fiji Press.
- Gani, A., (1999). “Foreign Direct Investment in Fiji”, *Pacific Economic Bulletin*, 14(1): 87-92.
- Gosaraevski, S., H. Hughes and S. Windybank, (2004). *The Pacific is Viable*, Issue Analysis No.43, Canberra: Centre for Independent Studies.
- Hill, H. and Athukorala, P. (1998). “Foreign Investment in East Asia”, *Asia-Pacific Economic Literature*, 12(2): 23-50.
- Hughes, H., (2003). *Aid has Failed the Pacific*, Issue Analysis No.33, Canberra: Centre for Independent Studies

- Jansen, K.(1995). “The Macroeconomic Effects of Direct Foreign Investment: The Case of Thailand”, *World Development*, 23(2): 183-210.
- Jayaraman, T.K. and Choong, C.K. (2006). “ Foreign Direct Investment in the South Pacific Island Countries: A Case Study of Fiji”. *World Review of Entrepreneurship, Management and Sustainable Development*, 2 (4), 309-322
- Jayaraman, T.K. (2005). *Regional Integration in the Pacific*, Working Paper 16/2005, USP Economics Department.
- Jayaraman T.K. (1998). “Foreign Direct Investment as an alternative to foreign aid to South Pacific Island Countries”, *Journal of the South Pacific Society*, 21(3-4): 29-44.
- International Labour Organisation, (2003). *Yearbook of Labour Statistics 2003*, Geneva.
- Morling, S and G. Williams, G. (2000). *Modeling Output Fluctuations in Fiji*, Reserve Bank of Fiji Working Paper No.01/2000, Suva: Reserve Bank of Fiji.
- Parry, T.G. (1988). “Foreign Investment and Industry in the Pacific Islands”, *The Journal of Developing Areas*, 22 (2): 381-400.
- Narayan, P.K. and Smyth, R. (2005a). “The Determinants of Aggregate Import Demand in Brunei Darussalam: An Empirical Assessment Using a Cointegration and Error Correction Approach”, *The Singapore Economic Review*, 50, 197-210.
- Narayan, P.K. (2005b). “The Saving and Investment Nexus for China: Evidence from Cointegration tests”, *Applied Economics*, 37, 1979-90.
- Schive, C.(1990). *The Foreign Factor: The Multinational Corporations’ Contribution to Economic Modernisation of the Republic of China*, Stanford: Hoover Institute Press.
- Sun, H.(1996). “Direct Foreign Investment and Linkage Effects: the Experience of China, *Asian Economies*, 25(1):5-28.
- Sun, H.(1998). “Macroeconomic Impact of Direct Foreign Investment in China: 1979-1996 ”, *The World Economy*, 21(5): 675-694.
- United Nations Conference on Trade and Development (2003). *World Investment Report*, Geneva: UNCTAD
- Vita, G. D. and Abbott, A. (2002), “Are Saving and Investment Cointegrated? An ARDL Bounds Testing Approach”, *Economics Letters*, 77, 293-299.
- World Bank (2006a). *Global Development Finance 2006* Volume 2: Country Tables, Washington, D.C: World Bank.
- World Bank (2006b). *World Development Indicators 2006*, CD-ROM, Washington, D.C. : World Bank.