

## **SCHOOL OF ECONOMICS**

### WORKING PAPER

#### **Contribution of Foreign Direct Investment and Financial Development to Growth in Pacific island Countries: Evidence from Vanuatu**

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### **Abstract**

This paper examines the roles of foreign direct investment (FDI) and financial development (FD) in Pacific island countries (PICs), with a case study on Vanuatu. It has been documented in various empirical studies on other regions that well developed financial systems enable countries to take advantage of FDI far more efficiently. Among the 14 PICs, ever since its independence in 1980, Vanuatu has been the leading recipient of FDI inflows. Utilizing the bounds testing procedure within the auto-regressive distributed lag framework, the paper seeks to test whether there is any nexus between FDI and FD in Vanuatu's economic growth. The findings are that (i) both FDI and FD have had a positive impact on output both in the short- and long-runs; and (ii) interaction between FD and FDI have positively contributed to output expansion, implying that the impact of FDI on output growth can be stepped up through FD.

Keywords: Foreign direct investment, financial development, real output, Vanuatu, bounds testing approach.

## 1. Introduction

It has been well established by various empirical studies that foreign direct investment (FDI) inflows, which are ably supported by a high degree of absorptive capacity in terms of human capital and supportive trade regime in the recipient country, promote economic development through the transfer of new technology and spillover efficiency (Balasubramanyam *et al.* 1996; Borensztein *et al.* 1998; Xu 2000; Kohpaiboon 2003). However, the role of financial development in combination with FDI inflows in the host country has been studied only in recent years and only in a few cases. Cross-country studies have shown that countries with well-developed financial systems tend to benefit more from FDI (Hermes and Lensink 2003; Alfaro *et al.* 2004). A few country case studies such as Choong, *et al.* (2005) and Ang (2008) on Malaysia have confirmed the hypothesis that better financial environment would facilitate greater absorption of likely benefits of FDI inflows.

Available studies (Gani 1999) on the impact of FDI on economic development in Pacific island countries<sup>1</sup> (PICs) focused on FDI's contribution to growth. The objective of this paper is to examine how financial development affects the FDI–output relationship in PICs, by a case study of Vanuatu over the period 1983-2007. The rest of the paper is organised as follows. Section 2 reviews the trends in FDI inflows and financial development in PICs; section 3 gives a brief background of Vanuatu economy, which is the focus of our study; section 4 provides the analytical framework; and Section 5 concludes describes the empirical model and data sources; Section 6 discusses the results; and Section 7 concludes with some policy recommendation.

## 2. FDI inflows in the Pacific

The PICs, since their independence in the second half of the last century, have been assisted by official development assistance (ODA) in terms of bilateral grants from international donors, especially from their past colonial rulers. These grants provided substantial budgetary support. The annual aid flows were used for both financing recurrent expenditures of running the government machinery as well as for enabling the governments to undertake capacity enhancing public investments in infrastructure. Since the early 1990s, there has been a downward trend in ODA for budgetary support. Increasingly, PICs have been forced to pay attention to capital inflows as an alternative to foreign aid (Jayaraman 1998). Since PICs' financial and capital markets are undeveloped and domestic investment activities are small, capital inflows have not been remarkable. Further, there are considerable institutional and structural rigidities in factor markets as well, which have been attributed to customary land tenure, restricting availability of land, which have been a deterrent to land based investment projects.

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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, and Vanuatu.

Consequently, no financial assets have emerged to be substitutable and attractive enough from overseas investors' point of view. Furthermore, interest rates in PICs are found to be non-responsive in the short run to shifts in supply and demand. Prices do not adjust to equilibrate the demand for and supply of the limited financial assets, and most of the adjustment falls on quantities rather than on prices. In these circumstances, interest rate settings do not play any role in either attracting or deterring short term flows and hence monetary policy has limited scope for influencing short term capital inflows (Morling and Singh, 1998). The PICs are increasingly appreciative of the fact that in the light of the declining aid inflows, it would be more prudent to place emphasis on FDI inflows, which have been acknowledged to be the most constructive of all flows for the emerging markets. Further, they are less volatile and less prone to sudden withdrawal due to shifts in sentiment.

Table 1 presents net FDI inflows to seven major PICs. While portfolio investment has been absent in all PICs, net FDI flows to Vanuatu have been high both in absolute figures and in terms of percentages of GNP. Further, net flows of FDI to Vanuatu remained steady, unlike in the case of Fiji, where they were negative during some years. The apparent reason behind Vanuatu being the leading recipient of FDI flows has been the very high degree of openness of its economy, associated with its pure tax haven status, since there is no direct taxation of any kind on local residents, citizens or expatriates.

**Table 1: PICs: Net FDI Inflows (US\$ millions): 1970-2007<sup>a</sup>**

	<b>Fiji</b>	<b>Kiribati</b>	<b>PNG</b>	<b>Samoa</b>	<b>Solomon Islands</b>	<b>Tonga</b>	<b>Vanuatu</b>
1970-1974 (average)	10.28 (2.89)	n.d.	89.52 (10.05)	0.04 (n.d.)	0.12 (0.21)	n.d.	1.16 (n.d.)
1975-1979 (average)	12.18 (1.59)	n.d.	24.30 (1.27)	0.15 (n.d.)	5.04 (5.52)	0.05 (0.12)	5.57 (4.10)
1980-1984 (average)	32.93 (2.77)	-0.18 (-0.61)	100.43 (4.00)	0.10 (0.02)	1.21 (0.62)	0.02 (0.03)	6.07 (4.88)
1985-1989 (average)	17.25 (1.50)	0.20 (0.78)	124.84 (3.96)	0.21 (0.21)	5.51 (2.04)	0.11 (0.15)	8.72 (5.78)
1990-1994 (average)	71.88 (4.66)	0.16 (0.49)	99.07 (2.51)	4.56 (3.74)	12.92 (3.57)	0.98 (0.70)	26.92 (12.53)
1995-1999 (average)	32.27 (1.83)	n.d.	200.11 (4.79)	5.92 (2.52)	12.36 (2.32)	2.20 (1.30)	24.19 (10.36)
2000-2004 (average)	58.88 (2.51)	n.d.	66.63 (1.93)	0.48 (0.11)	1.50 (0.31)	2.63 (1.52)	17.50 (6.92)
2005	159.96 (5.40)	n.d.	33.59 (0.68)	-2.98 (-0.68)	18.58 (4.49)	12.26 (5.69)	13.25 (3.58)
2006	373.66 (11.80)	n.d.	-6.87 (-0.12)	20.67 (4.60)	18.62 (4.08)	11.60 (4.91)	43.45 (10.52)
2007	268.94 (8.03)	n.d.	95.77 (1.53)	2.49 (0.46)	42.42 (7.99)	27.35 (10.82)	34.16 (6.73)

<sup>a</sup> Figures in parentheses denote percentages to GDP.

Source: World Development Indicators Database 2009, World Bank.

### *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 times 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 are confined to the services sector.

### **3. Vanuatu's Economy**

Vanuatu (population 215,000), whose selected key indicators are given in Table 2, share many commonalities with rest of the PICs. Its economy is heavily subsistence oriented, dominated by root crops; and commercial ranch and fishery activities to a small extent, which provide livelihood to 80 percent of the population. The country's manufacturing base is small, which is confined to processing coconut oil based soaps and detergents, and biscuits and breads. However, Vanuatu has been historically an open economy with OFC institutions inherited from the days of the joint Anglo-French condominium rule. The country also provides flag-of-convenience registration of ships. Additionally, absence of all forms of direct taxation, including personal and corporate income taxes, estate taxes, death duties and gift taxes, have made Vanuatu a popular tax free haven in the South Pacific. Thus, services sector of Vanuatu comprising financial and tourism activities, has been a major support to Vanuatu's economy, which has also been attracting FDI inflows.

**Table 2: Vanuatu: Selected Key Indicators**

Land Area (Sq.km.'000)	12.2
Population (2006: '000)	215
Per Capita GDP (US\$) Current prices: 2006	1,799
Aid Per Capita in US\$ (2006)	227
Aid as percentage of GDP (2006)	13.4
Human Development Ranking (2006)	118
Annual Average Growth Rate in percent (2001-2007)	2.7
Annual Average Inflation in percent (2001-2007)	2.5
Overall Budget Balance as percent of GDP (2001-2007)	-0.5
Current Account Balance as percent of GDP (2001-2007)	-5.4

Source: ADB (2006), UNESCAP (2008)

### *Structure of the financial system and market*

Vanuatu's financial sector includes Reserve Bank of Vanuatu, four commercial banks (a government-owned bank, a locally owned bank and two foreign banks namely Westpac and ANZ.), a number of trust and insurance companies, the Vanuatu National Provident Fund (VNPF), and several smaller financial institutions (Table 3). In 2001, following a merger, the number of commercial banks dropped to four. At present, the largest bank has almost 70 percent of total assets of the banks.

**Table 3: Vanuatu: Financial system structure**

	Assets (Billions of vatu)	Percent in Total Assets	Number of Institutions	Percent of GDP
Commercial Banks (total)	43.1	11.2	5	147.2
Commercial Banks of which: State controlled	2.7	0.7	1	8.5
Offshore banks	337.5	87.9	36	1061.3
Insurance companies	0.5	0.1	3	1.6
Pension funds	3.1	0.8	1	9.7
Total	384.2	100.0	45	1219.8

Source: RBV (2008)

Vanuatu's OFC, includes 24 offshore banks with offshore banking licenses, and 16 insurance companies. Offshore banks are regulated by the International Bank Act (2002) and are supervised by the RBV, as are domestic banks. Offshore banks are not allowed to accept local deposits from, or make loans to, residents in Vanuatu. Prior to 2003 when the new act came into effect, offshore banks were supervised by the Financial Service Commission.

As of end-December 2008, the total assets of the financial system were about 387.9 billion vatu, equivalent to 1,219.8 percent of GDP. If offshore banks are excluded, however, the total assets drop to 50.4 billion vatu, equivalent to 158.5 percent of GDP (Table 1). Given the restrictions which apply to the ability of the offshore banks to deal in domestic currency and to do business with the domestic banks, the commercial banks play a dominant role in the domestic financial system and the offshore banks have no direct impact on the conduct of monetary policy.

Banking activities are largely confined to two urban centres in the country, Port Vila and Santo, in which formal sector activities are concentrated. The financial deepening process, as reflected in the ratios of narrow and broad money, has been slow. As Vanuatu has no vibrant primary and secondary markets in bond and equity and other financial securities, there are no attractive financial assets other than saving and time deposits for savers to invest in. Table 4 presents monetary statistics of Vanuatu. Narrow money consists of currency (the vatu) and demand deposits in vatu, while broad money comprises narrow money plus demand deposits in foreign currency and savings and time deposits in both vatu and foreign currency. Following liberalisation of the economy in general and financial sectors, with discontinuance of controls on lending and deposit rates in mid 1990s, the ratio of broad money to GDP has been on the rise

**Table 4: Vanuatu: Selected Output and Monetary Statistics**

	<b>Output Growth (%)</b>	<b>Inflation (%)</b>	<b>Interest Rate (%)</b>	<b>ER (US\$/Dom Currency)</b>	<b>M1 (% of GDP)</b>	<b>M2 (% of GDP)</b>
1980-89 (Ave)	8.8	8.8	16.7	0.010272	39.9	219.0
1990-99 (Ave)	5.1	3.2	13.6	0.008522	31.1	218.0
2000-04 (Ave)	0.6	2.5	7.9	0.007692	30.2	191.6
2005	6.5	1.2	7.5	0.009154	34.5	197.6
2006	7.2	2.0	8.3	0.009038	38.7	196.6
2007	6.6	3.9	8.2	0.009762	39.2	198.0

Source: International Monetary Fund (2008)

#### **4. Development of the Financial Sector in Vanuatu**

The FDI inflows to PICs, including Vanuatu to natural resource sectors have proved beneficial. Hotel and tourist resort development has been mainly due to substantial FDI in tourism sector, providing scope for local employment (Jayaraman and Singh 2007), besides emerging as one of the major sources of foreign exchange. Other traditional areas, including sugar and logging, which have been the prime movers in the past, attracting inflows of FDI, are now on the wane due to increased competition from more inexpensive exporting countries in Asia.

Impact of FDI on economic development depends on the absorptive capacities of the recipient PICs, such as human capital and infrastructure development. One another aspect, which is increasingly being focused upon, is the development of local financial markets (Hermes and Lensink 2003; Omran and Bolbol 2003; Alfaro *et al.* 2004; Durham 2004). There are two indicators of financial sector development. They are (i) broad money (M2), consisting of currency, demand deposits as well as quasi money, namely time and saving deposits (also referred to as financial savings), which is expressed as percentage of gross domestic product (GDP); and (ii) credit to private sector by financial institutions, expressed as percentage of GDP.

Among the two indicators, credit to private sector has been recognized as more important than the other. It was Schumpeter (1911), who was the first to highlight the importance of credit to entrepreneurs for financing the adoption of new production techniques. Financial institutions in have played the financial intermediation role by transferring funds from savers to prospective borrowers for investing in productive activities. Other leading contributions in this regard include Gurley and Shaw (1955), Goldsmith (1969), Hicks (1969), McKinnon (1973) and Shaw (1973). They put forward a cogent case for raising the level of financial development by implementing financial sector reforms for liberalizing the economy from government controls in regard to interest rates for mobilizing deposits and lending activities as well as from all quantitative restrictions<sup>2</sup>.

Besides the direct impact of financial systems on growth, interaction between FDI and FD enables the host country to take advantage of benefits from spillovers associated with FDI. The interaction between FDI and FD would be working through (i) provision of more credit facilities, enabling entrepreneurs who lack internal funds to purchase new machines, adopt new technology, and hire better skilled managers and labours (Omran and Bolbol 2003, Alfaro *et al.* 2004), (ii) development of domestic financial markets, which relaxes credit constraints faced by foreign firms, allowing them to extend their innovative activities to the domestic economy (Hermes and Lensink 2003); and (iii) operation of an efficient financial system, which facilitates FDI towards creation of backward linkages, which are beneficial to the local suppliers in the form of improved production efficiency (Alfaro *et al.* 2004; Ang 2008). Accordingly, we proceed to undertake the empirical analysis, which is described in the next section.

## 5. Data, Modeling and Methodology

Our empirical model is constrained by general data deficiencies, which mark PICs. National income accounts are available only from early 1980s. Further, as there are no disaggregated data available on FDI inflows into various activities as well as credit to private sector activities, our model remains simple. The period for which reliable and consistent time series are available covers 25 years (1983-2007). The data sources for FDI are *Global Development Finance* (World Bank 2009); for GDP the World Development Indicators (World Bank 2009); for financial

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<sup>2</sup> Endogenous growth models since 1990s, which have incorporated financial institutions as a variable, support the finance-led growth argument by demonstrating that financial development reduces informational frictions and improves resource allocation efficiency (Greenwood and Jovanovic 1990; King and Levine 1993b; Pagano 1993).



development indicators, the International Financial Statistics (International Monetary Fund 2009).

The model is written as follows:

$$RGDP_t = f(FDI_t, FD_t, XGS_t, FDI_t * FD_t) \quad (1)$$

where  $RGDP_t$  is real gross domestic product (GDP, in vatu constant prices);  $FDI_t$  indicates foreign direct investment inflows as a share of GDP;  $PCR_t$  is a measure for financial development, that is, represented by domestic credit to private sector as a share of GDP (PCR);  $XGS_t$  is the exports of goods and services as a percentage of GDP;  $FDI_t * PCR_t$  is the interaction term between financial development ( $PCR_t$ ) and foreign direct investment ( $FDI_t$ ). All variables are transformed into their natural logarithms.

In view of the limited data availability, we adopt the bounds testing procedure proposed by Pesaran, *et al.* (2001) to examine the long-run equilibrium relationship among the variables. The ARDL model is a general dynamic specification, which uses lags of the endogenous variable and the lagged and contemporaneous values of the explanatory variables, via which short-run effects can be directly examined and long-run relationship estimated indirectly<sup>3</sup>.

An ARDL model of Equation 1 is constructed as follows:

$$\begin{aligned} \Delta LRGDP_t = & \beta_0 + \beta_1 LRGDP_{t-1} + \beta_2 LFDI_{t-1} + \beta_3 LPCR_{t-1} + \beta_4 LXGS_{t-1} \\ & + \beta_5 (FDI * PCR)_{t-1} + \beta_6 TREND_t + \sum_{i=1}^p \alpha_{1i} \Delta LRGDP_{t-i} + \sum_{i=0}^p \alpha_{2i} \Delta LFDI_{t-i} \quad (2) \\ & + \sum_{i=0}^p \alpha_{3i} \Delta LPCR_{t-i} + \sum_{i=0}^p \alpha_{4i} \Delta LXGS_{t-i} + \sum_{i=0}^p \alpha_{5i} \Delta (LFDI * LPCR)_{t-i} + \varepsilon_t \end{aligned}$$

We also introduce trend or time variable ( $TREND$ ), which captures the effect of other relevant variables which otherwise are omitted for the reason that data for relevant time series are not available on a consistent basis. Moreover, we found a clear positive-linear trend in the levels of  $LRGDP$  and  $LPCR$  over the sample period, therefore including a trend variable in the estimation process further improved the level of significance of other core variables.

There are two steps in investigating the relationship between real output, FDI, private credit, exports and the interaction term. First, we estimate Equation (2) by ordinary least squares (OLS) techniques. Second, we impose a restriction on all estimated coefficients of lagged level

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<sup>3</sup> The use of this technique is also based on its advantages over the conventional cointegration procedure. See, for example, Pesaran *et al.* (2001), Chang *et al.* (2001), Narayan and Smyth (2006), among others for the advantages and applications of ARDL.

variables equal to zero to examine the presence of a long-run relationship between the variables. This can be performed by using F-statistics (or Wald statistics) with the null hypothesis of no cointegration ( $H_0 : \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$ ) against its alternative hypothesis of a long-run cointegration relationship ( $H_1 : \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0$ ).

If the calculated F-statistic is higher than the upper critical bounds value, then the null hypothesis is rejected. In contrast, if the calculated F-statistic is less than lower critical bounds value, it suggests that no long-run relationship between variables. If the calculated F-statistic falls between lower and upper bounds values, then the result becomes inconclusive.

### *Granger causality test*

After examining the long-run relationship between the variables, we proceed to the Granger causality test in the parsimonious vector error correction model (PVECM) framework to find a short-run causal relationship between real output, FDI, private credit, exports and the interaction term. In PVECM framework, we estimate the change in both endogenous and exogenous variables on lagged deviations and it can be expressed as follows<sup>4</sup>:

$$\Delta Z_t = \Pi Z_{t-1} + \Gamma_1 \Delta Z_{t-1} + \Gamma_2 \Delta Z_{t-2} + \dots + \Gamma_{p-1} \Delta Z_{t-p+1} + u_t \quad (3)$$

where  $\Delta Z_t = [\Delta LR GDP, \Delta LFDI, \Delta LPCR, \Delta LXGS, \Delta LFDI * LPCR]'$ ,  $\Pi = -\left(1_m - \sum_{i=1}^p A_i\right)$  and

$$\Gamma_i = -\left(1 - \sum_{j=1}^i A_j\right). \text{ For } i = 1, \dots, p-1.$$

$\Gamma$  represents the short run impact of the changes in  $Z_t$ .

Meanwhile, the  $(5 \times 5)$  matrix of  $\Pi = (\alpha\beta)'$  incorporates the speed of adjustment to long-run equilibrium ( $\alpha$ ) and the long-run information ( $\beta$ ) such that the term  $\beta' Z_{t-p}$  measures the  $(n-1)$  cointegrating vector on the model.

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<sup>4</sup> Engle and Granger (1987) and Irandoust and Ericsson (2004) provide a comprehensive discussion of this technique.

The short-run causal relationship between variables can be examined by computing the Wald test (F-statistics) with the null hypothesis that the set of coefficients ( $\Gamma_i$ ) on the lagged values of exogenous variables are insignificantly different from zero. If the null hypothesis is rejected, then it is found that the explanatory variables Granger cause the dependent variables. If  $\Pi$  is found insignificant based on the t-statistics, then both the exogenous and endogenous variables do not have a steady-state long-run relationship.

## 6. Results and Interpretations

### *Unit root test and bounds testing approach*

Although bounds testing approach does not require the same order of the integration of each variable under study, we use two unit root tests, the augmented Dickey and Fuller (ADF) (1979) and Ng and Perron (2001) to examine the stationarity properties of the series. These two unit root tests suggest that all series are integrated of order one (Table 5).

**Table 5: Results of unit root tests**

Variable	ADF		Ng and Perron	
	Level	First Difference	Level	First Difference
<b>LRGDP</b>	-1.903	-3.808**	-5.859	-9.148**
<b>LFDI</b>	-2.667	-6.017**	-8.799	-9.767**
<b>LPCR</b>	-3.111	-6.533**	-8.770	-9.409**
<b>LXGS</b>	-2.776	-4.373**	-6.900	-10.859**
<b>LFDIPCR</b>	-2.569	-5.770**	-8.600	-9.711**

Notes: The ADF critical values are based on Mckinnon. The optimal lag is chosen on the basis of Akaike Information Criterion (AIC). The null hypotheses for both ADF and Ng-Perron tests are a series has a unit root (non-stationary) while the null hypothesis of the KPSS test is does not contain unit root (stationary).

The asterisk \*\* denotes the rejection of the null hypothesis at the 5% level of significance.

The results of bound tests are shown in Table 6. The calculated F-statistic is greater than the upper bound value in the equation with LRGDP as the dependent variable, which rejecting the null hypothesis of no long-run relationship between real output, FDI, private credit, exports and the interaction term between FDI and private credit at 1% significance level. Nevertheless, the respective F-statistics in the equations with other variables as dependent variables are found insignificant even at 10% significance level.

The estimated coefficient of all variables is statistically significant at the 10% level or better, as follows5:

<sup>5</sup> We have deleted the trend variable (TREND) as it is not significant. The deletion of this variable does not change the estimated coefficient of the variables and the expected sign substantially. The results are available upon request.

$$LRGDP = -2.749 + 4.955LFDI *** + 3.101LPCR *** + 0.387XGS * + 1.397(LFDI * LPCR) ***$$

$$t = \quad (-1.551) \quad (4.998) \quad (5.393) \quad (2.376) \quad (4.957)$$

(4)

\* and \*\*\* indicate significance at 10% and 1% levels, respectively. Figures in parentheses are t-statistics.

**Table 6: Results of Bound Tests**

Dependent Variable		Computed F-statistic		
LRGDP		23.471***		
LFDI		1.245		
LPCR		0.453		
LXGS		2.559		
LFDIPCR		1.015		
		Pesaran, et al. (2001) <sup>a</sup>		Narayan (2005) <sup>b</sup>
Critical Value	Lower bound value	Upper bound value	Lower bound value	Upper bound value
1 per cent	3.41	4.68	4.134	5.761
5 per cent	2.62	3.79	2.910	4.193
10 per cent	2.26	3.35	2.407	3.517

<sup>a</sup> Critical values are obtained from Pesaran et al. (2001), Table CI(iii) Case III: Unrestricted intercept and no trend, p. 300.

<sup>b</sup> Critical values are obtained from Narayan (2005), Table case III: unrestricted intercept and no trend, p. 10. \*, \*\* and \*\*\* indicate significance at 10%, 5% and 1% levels, respectively.

All the explanatory variables have the theoretically expected signs. There is a positive and significant relationship between real output and FDI, suggesting that a well-developed financial development leads to a higher output. This finding is generally consistent with the studies on finance and development (for example, King and Levine 1993a; Levine et al. 2000; Akinlo (2004), Ang and McKibbin 2007; Ang 2009). A one percent increase in PCR leads to a close 5 percent in real output. We also find a strong evidence of export-led growth hypothesis in Vanuatu. The estimated coefficient suggests a one percent increase in XGS promotes about 0.387-0.535 percent increase in real output. The interaction term between FDI and financial development is statistically significant and positively correlated to real output. Hence, it is concluded that the effect of FDI on Vanuatu economy is enhanced by the level of sophistication of the domestic financial system. Our finding is in line with the results of Hermes and Lensink (2003) and Alfaro *et al.* (2004), Choong, *et al.* (2005), and Ang (2009).

Further, diagnostic tests such as Jacque-Bera normality test, Breusch-Godfrey Serial Correlation LM test, Heteroskedasticity test (ARCH), Ramsey RESET Mis-specification test suggest that Equation 4 performs reasonably well. These tests reveal that the residuals are normally distributed, serially uncorrelated with homoscedasticity of residuals, and confirming the equation

has a correct functional form. In addition, the CUSUM and CUSUM of Squares plots indicate that the parameters of the equation are stable over time<sup>6</sup>.

### *Granger causality test*

Table 7 shows the results of long- and short-run Granger causality tests. Among the five equations, error correction term (ECT) is statistically significant with the negative sign only in the equation with LRGDP, as dependent variable. This finding is consistent with the bound test, confirming that there is only one cointegrating equation, which is the one with LRGDP as dependent variable.

Looking at the short-run causality relationship, we find that there is a bi-directional causality between (i) real output and FDI; (ii) real output and private credit; (iii) FDI and private credit; and (iv) private credit and exports. The finding of bi-directional causality between FDI and growth is consistent with Choe (2003) and Basu, *et al.* (2003). However, there is a unidirectional causality running only from exports to real output, which establishes the hypothesis of export-led growth in Vanuatu. The results confirm that both FDI and financial sector development have a positive impact on output both in the short- and long-run and the effect of FDI on real output can be enhanced via the efficiency of domestic financial system.

**Table 7: Granger causality test for Tonga**

Dependent Variable	F-statistics					ECT (t-statistics)
	$\Delta$ LRGDP	$\Delta$ FDI	$\Delta$ LPCR	$\Delta$ LXGS	$\Delta$ LFDIPCR	
$\Delta$ LRGDP	-	5.889**	8.008**	9.438***	7.434**	-0.0213** (-3.204)
$\Delta$ FDI	3.119*	-	22.640***	2.402	35.687***	-0.0003 (-0.126)
$\Delta$ LPCR	2.821*	20.119***	-	3.326*	9.978***	-0.0053 (-0.977)
$\Delta$ LXGS	0.845	1.134	2.859*	-	1.842	-0.0056 (-0.611)
$\Delta$ LFDIPCR	0.243	13.891***	14.041***	0.091	-	-0.0184 (-1.600)

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

## 7. Summary and Conclusions

This paper undertook an empirical examination of impact of FDI as well as interaction between financial sector development and FDI on output in Vanuatu, an island country as a case study. The study results show that there is strong empirical evidence of positive direct relationship

<sup>6</sup> The CUSUM and CUSUM of Squares plots are not reported in order to conserve space. However, the results are available upon request.

between FDI and real output, and financial development exhibits a significant positive effect on output not only in the short-run and also in the long-run. Moreover, the results also reveal that there is an indirect relationship between FDI and output via the development of domestic financial system, as evident by the significance of interaction term. Hence, the implication of the findings is clear: the efficiency of the domestic financial system in Vanuatu is a crucial precondition in order to benefit more from the advantages embodied in the FDI inflows.

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