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Impact of Trade Openness, Remittances, Capital Inflows & Financial Development on income in Vanuatu

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Abstract

In this study, using bounds approach and annual data for the period 1981-2008, the short and long-run effects of remittances and trade openness on income in Vanuatu are estimated. The results show trade openness and remittances having positive and significant effects, with no significant effects from financial development (*FIN*), foreign direct investment (*FDI*), and official development aid (*ODA*). *FDI* and *ODA* in this sense behave somewhat differently than remittances. Therefore a greater liberalization of goods and services market in general and short-term temporary movements of people in particular to boost remittances inflows and improving the overall institutional infrastructure is put forward as priority policy measures.

Keywords*: Remittances, trade, economic growth, FDI, financial sector development, ODA, bounds test, Vanuatu*

JEL Classifications: F21, F24, N27

I. Introduction

Vanuatu, one of the developing Pacific Island Countries (PICs), has a population size of some 240,000 which is growing at a rate of 2.5 percent per year. However, despite the world wide adverse impact of global financial crisis, the economy has been relatively less affected. Over the last three decades, inward remittances in absolute terms and trade as a share of GDP have been high with growth rate parking around 3 percent in 2009.

Agriculture is the main driver of the economy. The sector employs more than 70 percent of the working population and representing about 19 percent of the GDP. However, in terms of revenue inflows, tourism sector stands out. The principal tradable commodities in terms of exports of goods and services include fisheries, kava, cocoa, beef, timber, copra, fruits and other crops and vegetables, tourism, financial services, and the recently established short-term circular migration schemes (ADB, 2009b, c; Economic Intelligence Unit, 2009).

The economy is characterized with poor and costly infrastructure, weak governance, complex and outdated legal framework, limited access to finance particularly in rural and remote areas, and difficulties in mobilizing land for economic and productive uses. Currently, only about 13 percent of the rural adults have bank accounts and an estimated 92,000 (38 percent) of the population need access to secure and convenient financial services without which many of the rural households remain dependent on subsistence farming (ADB, 2009c).

In this paper, a macro level investigation is carried out using the augmented Solow approach to determine the long run nexus of remittances, trade openness (Rose, 2004), financial development, foreign direct investment and foreign aid, with per capita income. The rest of the paper is outlined as follows. Firstly, a brief literature survey is provided on various recent studies on the topic. Second, trends relating to the variables used in the study are provided. Thirdly, the data, method and model are discussed following with the analysis. Finally, we conclude with some policy suggestions.

II. A brief literature survey

Remittance inflows are defined as private income transfers from one or more family members living and working abroad back to the remaining family unit in the home country (Chami, Cosimano and Gapen, 2006). Over the last four decades, remittances have surpassed official development assistance of developing countries (Figure 1), and have been growing substantially increasing from US$22 billion in 1985-1989 to US$307 billion in 2009 (US$338 billion in 2008) despite the world economic crisis affecting most of the remittance the sending countries (World Bank, 2009b).

When poor families use remittances to increase consumption and in capital investment, it has the poverty reducing effect on the households (Buch and Kuckulenz, 2010; Maclellan and Mares, 2005; and Ratha, 2007). Further, besides providing 'buffer cash' during economic crisis and natural disasters (UN ESCAP, 2010; Browne and Leeves, 2007), when remittances are spent *inter alia*, on housing, sanitation, health care, food and schooling, results in improvement in welfare and human capital, which in turn have the possibility to increase productivity, freedom of choice and capacity to participate in public debate (De Haas, 2005) thereby reflecting the notion of development-as-freedom posited by Sen (1999).

Migration has become an outlet for many Pacific Island countries (PICs) including small islands states, such as Niue, Kiribati, Tuvalu, and Wallis and Futuna (Maclellan and Mares, 2005). However, in the past, Pacific access to Australia and New Zealand has been confined to the elites with very little chances of migration and work for those who were unskilled. This was largely signified by the introduction of the Pacific Access Category (PAC) (Bedford, 2010).

Common means of sending remittances in the Pacific region are through postal mails, and visiting migrant's or migrant's relatives or friends. Brown and Ahlburg (1999) in their study on PICs confirm that remittances sent or contributed are largely through informal channels. The formal channels used by the remitters in the region include Western Union money transfers, bank drafts and automated teller machines (ATM). The transaction costs involved in sending remittances to PICs through legal, banking channels have been high (Irving, Mohapatra and Ratha, 2010; Ratha and Riedberg, 2005).

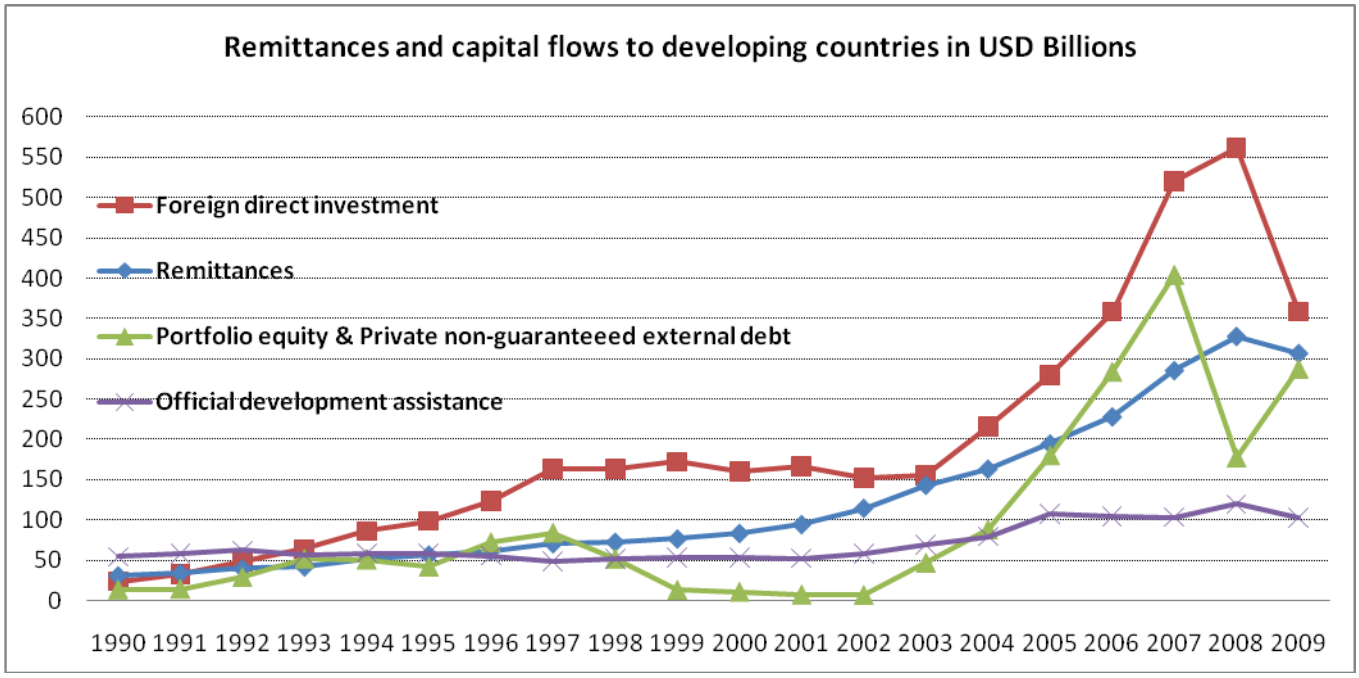
In regards to trade openness, a study by Wacziarg and Welch (2008) show that trade liberalization has resulted in higher growth for many countries, and those which experienced negative or no effect were mainly due to political instability, unfavourable macroeconomic policies, or high protection barriers. Winters, McCulloch and McKay (2004) argue that trade liberalization, if managed properly, can be an important component of a pro-poor development strategy. There is substantial body of literature on the subject on how the financial sector development plays a critical role in reallocating resources to the most productive investments, which in turn lead to higher economic growth (King and Levine, 1993; Beck, Levine and Loyaza, 2000; and Levine, Loayza and Beck, 2000). Kar, Peker, and Kaplan (2008) using Turkey as a case study finds that trade liberalization, financial development and the interaction between the two have positively contributed to economic growth in the long term. Similar conclusions have been made in case of Fiji, Samoa, and Tonga when remittance inflows are considered (Jayaraman, Choong and Kumar, 2010a*;* 2010b; 2009). Further, financial markets and financially developed economy are vital for foreign direct investment to have any positive effect on the economic growth (Alfaro et al., 2010). Shleifer (2009) and Rao (2007) however are

sceptical of aid having any significant effect on growth. Similarly, Bowman and Chand (2007) argue that in countries with relatively small population size and poor economic institutions, aid is likely to have a large negative outcomes..

III. Recent trends in remittance inflows

In the Pacific region, Vanuatu, whose key indicator is given in Table 2, has a relatively high inflow of remittances in absolute terms particularly in the early period of 1980-2004, however experienced a decline after that and then levelled-off to about US$7 million towards 2009 (Table 1). On average, prior to 2005, remittances capped to about US$14 million. The trend in remittance is also supported by the high number of out-migration which seems to compensate in the later periods (Table 3). Nevertheless, Fiji, Samoa and Tonga have been receiving substantial remittance inflows in absolute terms as compared to other PICs, while Tonga, Samoa, and Kiribati account for the largest number as a percent of GDP.

Figure 1



Sources: World Bank, Migration and Remittance data, July 2009, available: econ.worldbank.org; World Development Indicators online database; Global Development Finance online database; and Organization for Economic Co-operation and Development, Official and Private Flows data

Table 1: PICs: Remittances (US$ millions): 1970-2008[a]

	Fiji	Kiribati	PNG	Samoa	Solomon Islands	Tonga	Vanuatu
1970-1974	n.d.	n.a.	n.a.	n.a.	n.a.	2 (7.5)	n.a.
1975-1979	4 (0.5)	2 (4.5)	10 (0.6)	10 (13.2)	n.n.	6 (16.4)	n.a.
1980-1984	8 (0.7)	2 (6.9)	5 (0.2)	19 (19)	n.a.	10 (16.5)	8 (7.0)
1985-1989	26 (2.2)	4 (15.8)	9 (0.3)	34 (33.8)	n.a.	19 (22.5)	8 (6.0)
1990-1994	24 (1.6)	6 (19.3)	17 (0.4)	37 (28.1)	n.a.	21 (15.4)	12.2 (6.4)
1995-1999	30 (1.5)	7 (15.2)	13 (0.3)	44 (19.6)	2 (0.6)	61 (37.7)	22 (8.3)
2000-2004	73 (3.6)	7 (13.3)	11 (0.3)	54 (18.9)	4 (1.6)	61 (37.7)	22 (8.3)
2005	184 (6.2)	7 (11.4)	13 (0.3)	110 (25.9)	7 (2.4)	66 (30.6)	5.1 (1.4)
2006	165 (5.2)	7 (11.3)	13 (0.2)	108 (24.0)	20 (6.0)	72 (30.5)	5.0 (1.2)
2007	165 (4.8)	7 (9.0)	13 (0.2)	120 (22.9)	20 (5.1)	100 (39.6)	5.5 (1.1)
2008	175 (4.7)	9 (10.7)	13 (0.2)	135 (24.0)	20 (4.8)	100 (36.9)	7.0 (1.2)
2009	119 (3.9)	9 (6.7)	13 (0.2)	131 (26.5)	2.4 (0.4)	91 (29.1)	6.9 (1.1)

[a] Figures in parentheses denote percentages to GDP; the fiver-year interval are averages calculated by the author.
Source: World Bank (2008, 2009a)

Table 2: Vanuatu: Selected key indicators*

Land Area (Sq.km.'000)	12.2
Population ('000) (2010)	239.8
Population Growth as percent (2008)	2.5
Per Capita GDP (US$) Current Prices (2007)	2712.6
Aid Per Capita in US$ (2008)	396.1
Aid as percentage of GNI (2001-2008)	11.5
Annual Average Growth Rate in percent (2001-2009)	3.3
Annual Average Inflation in percent (CPI) (2001-2008)	2.8
Fiscal Balance of Central Government as percent of GDP (2001-2007)	-0.4
Current Account Balance as percent of GDP (2001-2007)	-5.7
Rural population as percent of total population (2008)	75.2

* interval periods are averages calculated by the author.
Source: World Bank (2009b), ADB (2009a), UNESCAP (2007)

Table 3: Vanuatu's Demographic Profile

Year	Net migration (-)	Population growth rate (%)	Population (10 year average in '000)	Remittances (millions USD)
1961-1970	3182	3.0	73.5	-
1971-1980	3540	3.1	99.6	-
1981-1990	2455	2.4	130.8	8.2
1991-2000	1508	2.4	169.9	20.0
2001-2005	1038	2.5	199.8	14.2
2006	-	2.6	216.4	5.0
2007	-	2.6	222.2	5.5
2008	-	2.5	228.0	7.0
2009	-	2.5	233.9	6.9
2010	814*	2.5	239.9	-

* indicates five-year average from 2006 to 2010; interval periods are averages calculated by the author.
Source: World Development Indicators (WDI), World Bank (2009b); United Nations, Department of Economic and Social Affairs, Population Division (2009). Trends in International Migrant Stock: The 2008 Revision (United Nations database, POP/DB/MIG/Stock/Rev.2008).

Financial Sector

Vanuatu's financial sector includes the Reserve Bank of Vanuatu (RBV), and four main commercial banking institutions (Table 4). The government owns one of the banks, and one is locally owned. Two banks, (ANZ and Westpac) are foreign owned banks. Among a number of smaller financial institutions, and one provident fund, namely the Vanuatu National Provident Fund (VNPF), a number of trust and insurance companies form the financial sector of the economy.

Table 4: Commercial financial institutions in Vanuatu

Commercial financial institutions	Assets (Billions of vatu)	Percent in Total Assets	Number of Institutions	Percent of GDP
Commercial Banks (total)	43.1	11.2	5	147.2
State Controlled commercial banks	2.7	0.7	1	8.5
Offshore banks	337.5	87.8	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: Jayaraman and Choong (2010, pp. 8)

The banking activities are mainly restricted in the urban centers of Port Vila and Santo. A branch of the government owned commercial bank, the Vanuatu National Bank (VNB) also operates in

the outer islands, however with limited functions such as deposit and withdrawals, and facilitating payment of salaries to the government workers who work in the islands. Other functions such as money transfer through Western Union are available in the islands.

The New Zealand's Recognized Seasonal Employer Scheme and the upcoming Australian Seasonal Pilot Worker Scheme are contributing to remittances growth in Vanuatu (Bedford, 2010as is becoming evident in places like Epi (Lamen Bay and Lamen Island), Tanna (ADB, 2005), Ambrym, and Mele village (Port Vila) in Vanuatu.

IV. Data, Method and Results

The study looks into the nexus between remittances, trade openness, capital flows and economic activities over a 28-year period (1981-2008). Table 5 presents the data used in the study. The objective is to investigate the plausible linkages between expenditures out of remittances facilitated by financial sector development, trade openness, foreign direct investment, foreign aid and GDP during this period.

Table 5: Vanuatu - GDP, Remittances, Trade and Financial Indicators[a]

Year/ Variables	Real GDP	Remittances	Exports of goods and services	Trade	Money & quasi money	Private sector credit	Net Foreign Direct Investment	Net ODA
	Growth Rate (percent)	REM (as percent of GDP)	XGS (as percent of GDP)	TR (as percent of GDP)	M2 (as percent of GDP)	FIN (as percent of GDP)	FDI (as a percent of GDP)	ODA (as a percent of GNI)
1981-1985	7.9	7.3	48.4	105.2	74.8	32.3	5.1	26.8
1986-1990	1.7	5.8	38.1	103.1	112.5	33.2	6.7	30.1
1991-1995	3.3	6.5	44.8	99.9	105.3	35.9	13.5	23.1
1996-2000	3.6	10.1	42.6	93.2	98.0	33.2	8.9	14.4
2001	-3.3	19.7	36.7	84.8	89.3	32.3	6.7	12.1
2002	-4.3	1.5	38.2	89.6	93.4	35.9	5.2	10.6
2003	3.7	1.2	42.1	88.9	87.8	37.3	5.6	10.6
2004	4.4	1.3	42.6	90.0	86.6	38.6	5.3	10.8
2005	5.1	1.3	43.6	94.0	90.0	42.4	3.3	10.4
2006	7.2	1.1	40.7	87.7	88.3	41.4	9.7	11.4
2007	6.7	1.0	39.4	85.5	88.2	41.5	6.3	11.0
2008	6.3	1.1	42.6	98.0	89.8	52.5	5.1	15.0
2009	4.0	1.1	-	-	-	-	4.2	-

[a.] the fiver-year interval figures are as average calculated by the author.
Source: data from World Development Indicators, World Bank (2009b) and Statistical Database System Online, ADB (2009b).

It is hypothesized that the variables used in the study will have a positive effect on income. Therefore, (i) remittances, (percent of GDP) (*REM*); (ii) financial sector development, proxied private sector credit (percent of GDP) (*FIN*); and (iii) trade openness (proxied by total of imports plus exports as a percentage of GDP) (*TR*), (Dollar and Kraay, 2004), are used in the first set of analysis. In the next two sets of analyses, foreign direct investment (*FDI*) and foreign aid (*ODA*) are included accordingly instead of *FIN*. All variables are transformed into log-form for estimation.

Using the conventional Cobb-Douglas production function, with the Hicks–neutral technical progress, the per worker output (y_t) is defined as:

$$y_t = A_t k_t^{\alpha}, \qquad 0 < \alpha < 1 \tag{1}$$

where A = stock of technology and k = capital per worker, and α is the profit share.
The Solow model assumes that the evolution of technology is given by

$$A_t = A_o e^{gT} \tag{2}$$

where A_0 is the initial stock of knowledge and T is time.

It is also plausible to assume for our purpose that

$$A_t = f(T, REM, TR, FIN) \tag{3}$$

The effect of *REM* and *FIN* on total factor productivity (*TFP)* can be captured with *TR*, *REM* and *FIN* entering as shift variables into the production function:

$$A_t = A_o e^{gT} REM_t^{\beta} FIN^{\lambda} TR^{\delta} \tag{4}$$

$$y_t = (A_o e^{gT} REM^{\beta}_t FIN_t^{\lambda} TR_t^{\delta}) k_t^{\alpha} \tag{5}$$

The above can be formulated as:

$$\Delta Ly^* = g + \beta \Delta LREM + \lambda \Delta LFIN + \delta \Delta LTR, \tag{6}$$

where, *L* denotes logs of respective variables, and the intercept term *g* is the *TFP* referring to other likely factors not included in the analysis.

The capital stock utilized for the study has been built up by a perpetual inventory method.[i] Labour is proxied by annual population data since there is no consistent time series data on employment. All data used in the analyses are sourced from *World Development Indicators* issued by the World Bank (2009b).

Since the number of observations is small, the bounds testing approach under autoregressive distributed lag (ARDL) procedure developed by Pesaran (Pesaran, Shin and Smith, 2001) is deployed. In bounds testing approach, pre-testing of unit roots is not required and it is possible to investigate cointegration of the levels of the variables, irrespective of their order. With a view to meeting the criticism that it is difficult to accept that variables of different orders are cointegrated, the unit root tests are conducted to ensure they are of the same order before including them into the analyses. In computing unit root tests to examine the time series properties of the variables, the ADF and Phillips-Perron (PP) test statistics are used. From the test results, all variables are nonstationary in their levels however stationary in their first differences (Table 6).

Table 6: Results of Unit Root Tests

Variable	ADF		Phillips and Perron	
	Level	First Difference**	Level	First Difference**
Ly_t	-1.808926	-4.14784	-2.096782	-4.16789
Lk_t	-1.677520	-3.10293	-1.677606	3.10628
$LTRD_t$	-2.946697	-4.745147	-3.081737	-4.73033
$LREM_t$	-2.164385	-6.05765	-2.130873	-6.05765
$LFIN_t$	-0.221470	-5.77416	-0.413833	-5.89235
$LFDI_t$	-2.903197	-7.28848	-2.839709	-7.98591
$LODA_t$	-2.846532	-5.548097	-2.917480	-6.331745

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

The next step is to examine the existence of a long run relationship between per worker output,(*y*) capital per worker (*k*), trade (*TR*), remittances (*REM*) and financial development measure (*FIN*) by using bounds test, as the first estimation.[ii]

The ARDL equations are given as follows:

$$\Delta Ly_t = \beta_{10} + \beta_{11}Ly_{t-1} + \beta_{12}Lk_{t-1} + \beta_{13}LREM_{t-1} + \beta_{14}LFIN_{t-1} + \beta_{15}LTR_{t-1} + \beta_{16}TREND + \sum_{i=1}^{p}\alpha_{11i}\Delta Ly_{t-i} + \sum_{i=0}^{p}\alpha_{12i}\Delta Lk_{t-i} + \sum_{i=0}^{p}\alpha_{13i}\Delta LREM_{t-i} + \sum_{i=0}^{p}\alpha_{14i}\Delta LFIN_{t-i} + \sum_{i=0}^{p}\alpha_{15i}\Delta LTR_{t-i} + \varepsilon_{1t} \quad (7)$$

$$\Delta Lk_t = \beta_{20} + \beta_{21}Ly_{t-1} + \beta_{22}Lk_{t-1} + \beta_{23}LREM_{t-1} + \beta_{24}LFIN_{t-1} + \beta_{25}LTR_{t-1} + \beta_{26}TREND + \sum_{i=0}^{p}\alpha_{21i}\Delta Ly_{t-i} + \sum_{i=1}^{p}\alpha_{22i}\Delta Lk_{t-i} + \sum_{i=0}^{p}\alpha_{23i}\Delta LREM_{t-i} + \sum_{i=0}^{p}\alpha_{24i}\Delta LFIN_{t-i} + \sum_{i=0}^{p}\alpha_{25i}\Delta LTR_{t-i} + \varepsilon_{2t} \quad (8)$$

$$\Delta LREM_t = \beta_{30} + \beta_{31}Ly_{t-1} + \beta_{32}Lk_{t-1} + \beta_{33}LREM_{t-1} + \beta_{34}LFIN_{t-1} + \beta_{35}LTR_{t-1} + \beta_{36}TREND + \sum_{i=0}^{p}\alpha_{31i}\Delta Ly_{t-i} + \sum_{i=0}^{p}\alpha_{32i}\Delta Lk_{t-i} + \sum_{i=1}^{p}\alpha_{33i}\Delta LREM_{t-i} + \sum_{i=0}^{p}\alpha_{34i}\Delta LFIN_{t-i} + \sum_{i=0}^{p}\alpha_{35i}\Delta LTR_{t-i} + \varepsilon_{3t} \quad (9)$$

$$\Delta LFD_t = \beta_{40} + \beta_{41}Ly_{t-1} + \beta_{42}Lk_{t-1} + \beta_{43}LREM_{t-1} + \beta_{44}LFIN_{t-1} + \beta_{45}LTR_{t-1} + \beta_{46}TREND + \sum_{i=0}^{p}\alpha_{41i}\Delta Ly_{t-i} + \sum_{i=0}^{p}\alpha_{42i}\Delta Lk_{t-i} + \sum_{i=0}^{p}\alpha_{43i}\Delta LREM_{t-i} + \sum_{i=1}^{p}\alpha_{44i}\Delta LFIN_{t-i} + \sum_{i=0}^{p}\alpha_{45i}\Delta LTR_{t-i} + \varepsilon_{4t} \quad (10)$$

$$\Delta LTR_t = \beta_{50} + \beta_{51}Ly_{t-1} + \beta_{52}Lk_{t-1} + \beta_{53}LREM_{t-1} + \beta_{54}LFIN_{t-1} + \beta_{55}LTR_{t-1} + \beta_{56}TREND + \sum_{i=0}^{p}\alpha_{51i}\Delta Ly_{t-i} + \sum_{i=0}^{p}\alpha_{52i}\Delta Lk_{t-i} + \sum_{i=0}^{p}\alpha_{53i}\Delta LREM_{t-i} + \sum_{i=1}^{p}\alpha_{54i}\Delta LFIN_{t-i} + \sum_{i=0}^{p}\alpha_{55i}\Delta LTR_{t-i} + \varepsilon_{5t} \quad (11)$$

There are two steps in examining the relationship between *Ly*, *Lk*, *LTR*, *LREM* and *LFIN*. First, Equations (7) to (11) are estimated by ordinary least squares techniques. Second, the existence of a long-run relationship can be traced by imposing a restriction on all estimated coefficients of lagged level variables equating to zero. Hence, bounds test is based on the F-statistics (or Wald statistics) with the null hypothesis of no cointegration ($H_0 : \beta_{i1} = \beta_{i2} = \beta_{i3} = \beta_{i4} = \beta_{i5} = 0$) against its alternative hypothesis of a long-run cointegration relationship ($H_1 : \beta_{i1} \neq \beta_{i2} \neq \beta_{i3} \neq \beta_{i4} \neq \beta_{i5} \neq 0$). The results of the bounds test are reported in Table 7, confirming the presence of a long run relationship amongst the variables when only real output per worker (*Ly*) is set as the dependent variable. Similar process is followed from (7) to (11) when *FDI* and *ODA* are analyzed. The computed F-statistics for *Ly* are given in respective columns: (a) 6.0288; (b) 4.7838; and (c) 7.2534 – all these values are significant at 5 percent or higher critical value upper bounds.[iii]

Table 7: Results of Bound Tests

(a)		(b)		(c)	
Dependent Variable	**Computed F-statistic**	**Dependent Variable**	**Computed F-statistic**	**Dependent Variable**	**Computed F-statistic**
Ly	6.0288**	*Ly*	4.7838**	*Ly*	7.2534**
Lk	1.6965	*Lk*	2.1623	*Lk*	2.0691
L REM	3.5616	*L REM*	0.7158	*LREM*	1.3667
LTR	1.6704	*LTR*	1.5971	*LTR*	2.4055
L FIN	1.7661	*LFDI*	1.2647	*LODA*	2.5335

	Pesaran, Shin and Smith (2001)[a]		**Narayan (2005)[b]**	
Critical Value	Lower bound value	Upper bound value	Lower bound Value	Upper bound value
1 per cent	3.41	4.68	4.537	6.370
5 per cent	2.62	3.79	3.125	4.608

[a] Critical values are obtained from Pesaran, Shin and Smith (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. 10. ** indicate significance at 5%.

Having confirmed the existence of a long-run relationship between per capita output and per capita capital stock with *TR*, *REM* and *FIN*; with *TR*, *REM* and *FDI*; and with *TR*, *REM*, and *ODA*, the estimation of the long and short run equations are carried out. The results are presented in Table 8(a-c) respectively. A number of diagnostic test results such as: (a) Lagrange multiplier test of residual serial correlation; (b) Ramsey's RESET test using the square of the fitted values for correct functional form; (c) normality test based on a test of skewness and kurtosis of residuals; and (d) heteroscedasticity test based on the regression of squared residuals on squared fitted values indicates all the equations performed well as the disturbance terms are normally distributed and serially uncorrelated with homoscedasticity of residuals thus confirming the models have correct functional forms. Besides, the CUSUM and CUSUM of Squares plot showed that the parameters of the models are relatively stable over time.[iv]

Table 8a: Dependent variable: *RGDP/Labour* (*Ly*) ARDL(1,1,1,0,1)

Long-run coefficients				Short-run coefficients			
Regressor	Coefficient	t-ratio		Regressor	Coefficient	t-ratio	
Lk	0.28	3.006	***	*ΔLk*	-0.12	-0.8142	
LTR	0.80	3.021	***	*ΔLTR*	0.27	2.7422	**
LREM	0.07	3.996	***	*ΔLREM*	0.04	3.1983	***
LFIN	0.19	1.148		*ΔLFIN*	-0.02	-0.2926	
C	4.04	2.018	*	*C*	2.53	1.3568	
T	0.02	4.001	***	*T*	0.01	3.8326	***

ECT(-1)	-0.63	-3.3649	***
$\bar{R}^2$	0.62		
DW-statistics	2.538		

Diagnostic Tests

	LM Version	p-value	F Version	p-value
Serial Correlation	$\chi^2(1) = 2.8214$	0.093†	F(1,14) = 1.7810	0.203†
Functional Form	$\chi^2(1) = 0.6892$	0.406†	F(1,14) = 0.3969	0.539†
Normality	$\chi^2(2) = 0.2898$	0.865†	Not applicable	
Heteroscedasticity	$\chi^2(1) = 1.4937$	0.222†	F(1,23) = 1.4616	0.239†

*** - Significant at 1% level, ** - significant at 5% level and * - significant at 10% level.
† Rejection of null hypothesis at 1% level of significance.

Table 8b: Dependent variable: *RGDP/Labour* (*Ly*), ARDL(1,0,1,1,0)

Long-run coefficients				Short-run coefficients			
Regressor	Coefficient	t-ratio		Regressor	Coefficient	t-ratio	
Lk	0.25	2.454	**	*ΔLk*	-0.13	-0.8443	
LTR	0.84	3.460	***	*ΔLTR*	0.29	3.1454	***
LREM	0.06	4.411	***	*ΔLREM*	0.04	3.3054	***
LFDI	0.01	0.382		*ΔLFDI*	0.01	0.3879	
C	4.90	2.858	**	*C*	3.44	1.8424	*
T	0.02	4.885	***	*T*	0.01	5.2822	***
				ECT(-1)	-0.70	-3.9360	***
				$\bar{R}^2$	0.59		
				DW-statistics	2.218		

Diagnostic Tests

	LM Version	p-value	F Version	p-value
Serial Correlation	$\chi^2(1) = 0.54244$	0.461†	F(1,15) = 0.33268	0.573†
Functional Form	$\chi^2(1) = 0.45949$	0.498†	F(1,15) = 0.28086	0.604†
Normality	$\chi^2(2) = 0.68973$	0.708†	Not applicable	
Heteroscedasticity	$\chi^2(1) = 1.49360$	0.222†	F(1,23) = 1.4614	0.239†

*** - Significant at 1% level, ** - significant at 5% level and * - significant at 10% level.
† Rejection of null hypothesis at 1% level of significance.

Table 8c: Dependent variable: *RGDP/Labour* (*Ly*), ARDL(1,1,1,0,0)

Long-run coefficients				Short-run coefficients			
Regressor	Coefficient	t-ratio		Regressor	Coefficient	t-ratio	
Lk	0.26	3.503	***	*ΔLk*	-0.05	-0.356	
LTR	0.88	3.787	***	*ΔLTR*	0.29	3.446	***
LREM	0.06	4.904	***	*ΔLREM*	0.04	3.768	***
LODA	0.05	1.438		*ΔLODA*	0.03	1.525	
C	4.41	2.797	**	*C*	3.13	1.857	*
T	0.02	4.952	***	*T*	0.01	5.871	***
				ECT(-1)	-0.71	-4.265	***

		$\bar{R}^2$	0.63	
		DW-statistics	2.335	
Diagnostic Tests				
	LM Version	p-value	F Version	p-value
Serial Correlation	$\chi^2(1) = 1.5799$	0.209 †	F(1,15) = 1.0119	0.330 †
Functional Form	$\chi^2(1) = 1.0066$	0.316 †	F(1,15) = 0.6293	0.440 †
Normality	$\chi^2(2) = 0.2420$	0.886 †	Not applicable	
Heteroscedasticity	$\chi^2(1) = 1.8140$	0.178 †	F(1,23) = 1.7994	0.193 †

*** - Significant at 1% level, ** - significant at 5% level and * - significant at 10% level.
† Rejection of null hypothesis at 1% level of significance.

From the above Tables (8a-c), a 1 percent change in trade openness (*TR*) contributes to about 0.8 percent change in per capita income in the long run and about 0.3 percent in the short run. Remittance inflows (*REM*) are positive and significant at 1 percent level, contributing to about 0.07 percent in the long run and 0.04 percent in the short run, however, no significant effect from financial development (*FIN*), foreign direct investment (*FDI*) and aid (*ODA*). Further, the coefficient of the per capita capital stock, which denotes the profit share, is about 0.26 and is close to the stylized value of one-third. The error correction term (ECT_{t-1}), an indicator of the speed of convergence to long run equilibrium have the correct sign (negative), is significant at one percent level and on average is about -0.68, indicating a reasonably fast convergence to equilibrium.

V. Conclusions and policy implications

Inward remittance inflows have been a great support to most of the PICs. Remittances supplement the real resources and augment foreign exchange reserves. Remittances despite small as a ratio of GDP, remains significant contributor to economic growth in Vanuatu. The contribution from trade openness on growth is relatively high and significant as well.

Remittances inflows, which seems to behave differently that other capital flows in Vanuatu, therefore if further grows in size mat likely to have a greater positive impact on income relative to other capital flows. Foreign aid does not have the pro-growth effect (Shleifer 2009; Bowman and Chand, 2007) in the economy of Vanuatu. Similarly, foreign direct investments and financial development independently is not significant (Alfaro et al., 2010) contributor to growth. On the other hand, trade liberalization is momentous to growth.

In re-emphasizing the importance of remittances and trade liberalization in a small and developing economy like Vanuatu,[v] further points for policy purpose with emphasis on the holistic look at capital flows vis-à-vis growth and development are in order:

a) It is clear that remittance inflows need to be encouraged. Vanuatu government has signed a bi-lateral trade agreement with New Zealand government to participate in the Recognized Seasonal Employer Scheme. However, maximizing benefits from these schemes requires that remittances transfer back home is cost-effective, and appropriate socio-cultural policies and trainings are in place for villages and communities to make the best use of the remittances, particularly in housing development and small business initiatives.

b) In regards to trade liberalization, barriers to trade need to be minimized and proper strategies deployed to gain from trade, with greater emphasis on effective negotiation along sectoral lines under the mode 4 of General Agreement on Trade in Services (GATS), which covers services provided through temporary movement of natural persons to another country. Other opportunities in trade in services and labour mobility need to be explored.

c) The financial sector seems to be relatively ineffective in contributing to the income growth of the economy. However, financial institutions are key sectors in development (Alfaro et al., 2010) and therefore particularly, the commercial banks may need to consider: (i) opening up small branches in the islands similar to what the Vanuatu National Bank is doing at the moment; (ii) providing competitive interest rates; (iii) facilitating in small loans; and (iv) investing in micro-finance/savings related projects.

d) Resources need to be committed to improving the economy's infrastructure and options to minimize unnecessary overheads can be explored. Further, tax incentives need to be reviewed in view of retaining benefits from *FDI* inflows within Vanuatu as well as ensuring financial institutions are closely linked with capital investment initiatives.

e) Better management and channelling of foreign aid into productive projects need to be perused. Donor initiatives in Vanuatu need to be assessed critically whilst deploying aid vigilantly. Further, institutional framework may need to be strengthened for long term economic sustainability of the key drivers of the economy.

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[i] Capital stock is computed using perpetual inventory method, with investment proxied by gross fixed capital formation at constant 1983 prices, initial capital stock 2 times the 1983 real GDP and depreciation rate of 5 percent.

[ii] In the second and third estimation, *FIN* is replaced by *FDI* and *ODA* respectively.

[iii] The interaction between *FIN* and shift variables (*ODA*, *REM* and *TR*) could not be explored in the study due to small sample size and multi-collinearity problems.

[iv] The CUSUM and CUSUM of Squares plots are not reported in order to conserve space. However, the results are available upon request

[v] The results however cannot be generalized for all PICs.