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DO FOREIGN AID AND REMITTANCE INFLOWS HURT COMPETITIVENESS OF EXPORTS OF PACIFIC ISLAND COUNTRIES? AN EMPIRICAL STUDY OF FIJI

T.K. JAYARAMAN[a], CHEE-KEONG CHOONG[b] AND PRAVINESH CHAND[c*]

[a]*Fiji National University, Fiji Islands*
[b]*Universiti Tunku Abdul Rahman, Malaysia*
[c]*University of the South Pacific, Fiji Islands*

Foreign aid and remittance inflows have been playing major roles in the economic growth and development of Pacific island countries (PICs). However, the relationship between these international capital inflows and export competitiveness of PICs has not been adequately studied. It is generally held that such capital transfers tend to hurt exports, a phenomenon known as Dutch disease. The objective of this paper is to examine the validity of the Dutch disease hypothesis in PICs with a case study of Fiji. Employing the bounds testing procedure, this empirical study reveals that inflows of both foreign aid and remittances have been contributing to the appreciation of Fiji's currency. The study establishes the validity of the Dutch disease hypothesis as far as Fiji is concerned.

Keywords: Foreign Aids, Remittances, Export Competitiveness, Cointegration, Granger Causality Test
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1. INTRODUCTION

Since their independence in the second half of the last century, the Pacific island countries (PICs)[1] have been receiving generous foreign aid. Besides supplementing

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[1] The 14 Pacific island countries (PICs) are: Cook Islands, Fiji, Kiribati, Republic of Marshall Islands, Federated States of Micronesia, Nauru, Niue, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu. In addition, there are eight territories, being either possessions of, or enjoying a free association status with major powers, including the United Kingdom and France. All the 22 entities form part of the Pacific Community with its Secretariat located in New Caledonia. Only six PICs have independent currencies.

domestic savings, they have been adding to real resources of PICs, as they are in foreign exchange. In recent years, steadily rising inward remittances sent by migrant islanders residing and working in Australia, New Zealand, United States and Europe, have exceeded aid inflows. Aid and remittance flows into PICs have been observed to be relatively more stable and larger in terms of percentages of gross domestic product (GDP) when compared to those of other developing countries.

Expectedly, they have been raising concerns whether these inflows are hurting the export competitiveness of the island nations, a phenomenon known as Dutch disease,[2] which seems to be responsible for continuing stagnation in export earnings as reflected in their ratios to respective GDPs of the concerned PICs, and generally decreasing trend in export growth rates. Decline in export competiveness is associated with appreciation of currencies, which is identified as one of the side effects of capital inflows.

There are a number of publications on PICs, beginning from the path breaking six-volume study conducted by Hilarian Codipilly of World Bank (1993), which pointed out to the Pacific paradox of "plentiful aid with no growth," by attributing to the ineffective use of aid, studies by IMF including Browne (2006) and Avalos (2013) of UN ESCAP (2013). These studies hinted at the possibility of Dutch Disease. However, there has been no definitive empirical study. Most of the empirical studies undertaken so far have been cross-sectional studies employing panel data. They came invariably to an identical conclusion that the results obtained were of ambiguous nature and that occurrence of a Dutch disease was conjectural. These empirical studies include Fielding (2007a, 2007b, 2010), Brown (2008).

The reason behind the ambiguous nature of results appears to be due to inadequacies. In the first place, the period studied for countries included in the panel was short; the number of variables chosen for study did not go beyond exchange rate, aid and remittances and inflation, since data on other contingent factors influencing growth process were not available for the same period for all countries concerned. To the best of knowledge of the authors, there is no study undertaken so far of any specific PIC in this regard. This paper seeks to fill the gap by taking up Fiji, which among all PICs, has a fairly longer database offering sufficient scope for an intensive study by focusing on contingent factors as well.

The paper is organized on the following lines: whilst the next section presents a brief summary of the literature on the Dutch disease; the third section reviews the trends in aid and remittance inflows received by PICs in general and Fiji in particular; the fourth

They are Papua New Guinea (PNG), Fiji, Samoa, Solomon Islands, Tonga, and Vanuatu. We exclude PNG as an outlier because of its relatively larger population of about 7 million as well as large endowments of mineral resources including natural gas and oil and huge export potential together with a very well diversified export base of both tree crops and mineral exports. The remaining five PICs with independent currencies share commonalities of small land area and population and very narrow range of exports.

[2] The term refers to the consequences of a natural resource discovery in the Netherlands.

section outlines the methodology adopted for the empirical investigation; the fifth section reports the results; and the last section presents conclusions with policy implications.

2. A BRIEF REVIEW OF LITERATURE ON DUTCH DISEASE

One of the earliest contributions to the literature on the impact of steady inflows of aid was that of Professor Corden (1984). Focusing attention on the effect of capital inflows on domestic relative prices and output, Corden (1984) called the small states as price takers, since prices of all traded goods are fixed in world markets. Therefore, increase in domestic expenditure would result only in the rise of the prices of goods that are not internationally traded. The resultant relative price change would lead to a change in the composition of output, with the traded goods sector contracting. The aggregate output falls, justifying the description of the relative price effect as 'Dutch disease'.

Fielding (2007a) explains that in the basic Dutch disease model, the nature of the exchange rate regime makes little difference to the effects of an increase in foreign exchange income. If we assume that two goods (traded and non-traded) are produced by a single factor of production (labour), there would be two domestic market equilibrium conditions (for nontraded goods and for labour), and a balance-of-payments equilibrium condition, with only two endogenous relative prices: price index of nontraded goods relative to that of traded goods; and price index of labour relative to that of traded goods. It is argued that general equilibrium can only be attained through adjustment of real money balances, and in a basic model it does not matter whether this is achieved by nominal exchange rate adjustment or by an adjustment of foreign exchange reserves under a fixed nominal exchange rate.

Various channels of conveyances of the Dutch-disease effect of aid and remittance inflows have been identified. As income transfers, inflows of aid and remittances are expected to result in a *spending effect* causing an increasing in the consumption of tradable and non-tradable goods. Since prices of tradable goods are determined outside small economies, the relative prices of the domestic, non-tradable goods increase and contribute to boost the overall domestic price level. This leads to higher real exchange rate, both fueling and fueled by a *resource movement effect*: Rising non-tradable prices shift resources away from production of tradables to production of nontradables, exerting upward pressures on wages and other production costs, eventually resulting in higher overall price level. The real exchange rate would increase hurting the export competiveness, manifesting itself into the Dutch Disease (Ratha, 2013; Acosta, Lartey and Mandelman, 2009).

Aside from spending effect consequent to rise in inward remittances, there is also the effect flowing out of consumption-leisure tradeoff, relating to reduction in the overall supply of labor in the economy. Reduction in labor supply will only exacerbate price increases, especially in the non-tradable sector. The overall rise in price level would then

push the domestic currency to appreciate even further.

In labour surplus economies, the applicability of the above channels would be subject to some modifications. It is likely at least part of the excess demand for labor in the non-traded sector would be met by the surplus labor and the resource movement effect may not be as pronounced. However, various constraints including labor market imperfections and specific-skills shortages experienced in the non-traded sectors would still contribute to rise in the relative price of non-tradable goods, thereby exercising upward pressure on real exchange rate.

There are a number of empirical studies testing the validity of the Dutch disease hypothesis. Due to data constraints mainly imposed by inadequate number of years covered by time series, most of the studies happen to be panel studies. One of the earlier studies by Adenauer and Vagassky (1998) dealt with the countries of the West African Economic and Monetary Union, found convincing evidence that capital inflows led to substantial real exchange rate appreciation.

Rajan and Subramaniam (2005) conducted a larger cross-country study, covering Asian and Latin American countries and concluded that foreign aid inflows lead to the Dutch disease. A smaller panel study focusing on 13 Latin American countries, Ameudo-Dorantes and Pozo (2004) confirmed that remittances lowered export competitiveness. Lopez, Molina, and Bussolo (2008) reconfirmed this finding for a larger sample of countries, followed by Lartey, Mandelman, and Acosta (2012) who also segregated the resource movement and the spending effects and found remittances to shrink the tradable sector (relative to the non-tradable sector) - a finding consistent with the foregoing discussion.

However, there are a few notable country studies. An earlier study by White and Wignaraja (1992) on Sri Lanka established that aid inflows contributed to exchange rate appreciation. Similar finding was reached by Vergas-Silva (2009) for Mexico, Bayangos and Jansen (2009) for Philippines, and Bourdet and Falck (2006) for Cape Verde.

3. PICS: A BRIEF OVERVIEW OF AID AND REMITTANCE INFLOWS

PICs among the world's developing counties are as a group one of the largest recipients of aid. Most of them became politically independent in the second half of the last century. Recognizing the challenges faced by PICs, which include limited resource base, narrow range of exports and inadequate tax revenue to meet recurrent expenditure in the annual budgets, the former rulers in their geopolitical interests continued their assistance in terms of budgetary grants and capital expenditure support. Aid flows were a great support until the early 1990s.

Following end of the Cold War, priorities of the donors changed. In the emerging uni-polar world, attention was turned on reconstruction of the Eastern European states. As a result, donors scaled down aid flows to the rest of the world and began focusing only on capital projects in PICs, moving away from supporting recurrent expenditures.

Almost coinciding with their decision was the release of a World Bank Study (1993) on PICs, which observed that PICs, despite high per capita aid, performed dismally in comparison to similarly placed island countries in the Caribbean and Indian Ocean regions.

During 1970-1993, while per capita gross domestic product (GDP) in the Caribbean island countries grew at 2.8 percent per annum, the corresponding rate in ten PICs, for which comparable data are available, was only 1 percent. Poor growth in PICs marked by stagnation in per capita incomes in the midst of plentiful aid over two decades came to be looked upon as a "Pacific Paradox" (World Bank, 1993). Following the findings of the World Bank study, donors began to phase out bilateral aid for recurrent expenditures such as wages and salaries and laid emphasis on project and sector programmes loans, and technical assistances.

Fiji amongst the 14 PICs is the only country which is classified as an upper middle income country with per capita income of US$4430, while the rest of the PICs are classified as low income countries, with per capita incomes below the threshold level at US$1025. That explains the relatively less aid received per capita by Fiji as compared to other PICs.

Table 1 shows that among PICs, Solomon Islands and Vanuatu received large foreign aid as percent of their GDPs. However there have been wide fluctuations in aid flows.

Table 1. Six Major PICs: Aid as Percentage of GDP

Year	Fiji	Samoa	Tonga	Solomon Is.	Vanuatu	PNG
1980-1989 (ave.)	5.4	21.9	23.5	24.4	30.0	33.3
1990-1999 (ave.)	3.6	22.3	16.6	14.6	20.2	18.0
2000-2004 (ave.)	2.4	12.7	11.1	17.6	12.7	11.7
2005-2009 (ave.)	2.5	10.9	9.7	44.2	13.3	8.6
2010	2.8	26.6	18.9	61.4	15.9	9.0
2011	2.4	16.4	21.3	49.6	11.9	8.6
2012	1.9	n/a	n/a	n/a	12.2	n/a

Source: World Bank (2014).

As regards remittances, PICs happen to be amongst the world's highest recipients. Migration has become an outlet for many in PICs, as islanders have been seeking employment in metropolitan countries on a regular basis. They have been remitting funds to their elderly parents or their families, who have been left behind, primarily for supporting them. Monthly or even seasonal remittance inflows have proved to be a great support for families to keep up their consumption levels as well as for meeting educational expenses for children and medical expenses for the elderly. Among the PICs, Samoa and Tonga are the largest recipients of remittances as percent of GDP (Table 2).

Table 2. Six Major PICs: Remittance as Percentage of GDP

Year	Fiji	Samoa	Tonga	Solomon Is.	Vanuatu	PNG
1980-1989 (ave.)	0.9	28.2	21.1	n/a	6.6	0.2
1990-1999 (ave.)	1.2	24.5	16.5	0.5	7.6	0.1
2000-2004 (ave.)	3.7	18.6	31.4	1.3	7.5	0.2
2005-2009 (ave.)	6.0	20.3	27.2	0.6	1.4	0.1
2010	5.7	21.3	20.6	0.2	1.7	0.1
2011	5.6	22.1	16.5	0.2	2.8	n/a
2012	5.5	23.2	12.6	1.7	2.8	n/a

Source: World Bank (2014).

3.1. Fiji: Aid Inflows and Inward Remittances

Fiji has been traditionally the least recipient of aid amongst PICs. Its relatively broad based tax system as well as a significant manufacturing sector producing consumer goods such as biscuits and cooking oil, has enabled Fiji to depend much less on aid. In more recent times aid has been on the decline, as the metropolitan countries imposed sanctions and reduced aid flows following the military coups of 2000 and 2006.

On the other hand, increased migration over the last two decades of skilled people, initially instigated by the two military coups of 1987, and later by the prevailing uncertainties in political environment after the civilian coup of 2000 and the military coup of 2006, led to rise in remittances. Table 3 illustrates the situation of falling aid inflows and rising remittances in recent years.

Table 3. Fiji: Aid and Remittances (percent of GDP): 1980-2012

Year	Aid as % of GDP	Remittances as % of GDP
1980-1989 (ave.)	5.37	0.90
1990-1999 (ave.)	3.60	1.15
2000-2004 (ave.)	2.39	3.69
2005-2009 (ave.)	2.47	5.98
2010	2.81	5.73
2011	2.44	5.63
2012	1.90	5.50

Source: World Bank (2012).

4. MODELING, DATA AND RESULTS

We now proceed to undertake the empirical investigation for testing the hypothesis that aid and remittances positively affect the real exchange rate. The nominal exchange rate is defined as units of foreign currency per one unit of domestic currency and the real exchange rate is the product of nominal exchange rate and the ratio of domestic price to world price. The real exchange rate used in the analysis is the real effective exchange rate (REER), which is the trade-weighted rate as reported by the International Monetary Fund (2014). The data series on REER are in terms of index numbers.

The PICs are highly open economies. Increasingly liberalized trade over the last two decades, which has been facilitated through reduction in tariffs, has been lowering all import prices which affect non-tradables' prices as well. Lower prices in non-tradable sector would result in lower inflation and hence would result in real depreciation of the currency. Accordingly, we introduce the variable, namely share of trade in GDP, which represents openness of the economy. The latter is defined as the sum of exports and imports and it is hypothesized that openness of trade would directly influence REER.

We propose to include a policy variable, which would reflect both fiscal and monetary policies. Expansionary fiscal and monetary policies, represented by rise in domestic credit (DC), which includes credit both to government and private sector as a ratio of GDP is expected to have an effect on REER. We cannot say *a priori* whether REER and the proxy variable for government economic policies, the ratio of DC to GDP will move in the same direction or not. The sign of the coefficient may either be positive or negative. Expansionary policies may result in inflation and hence reduce the competiveness, if domestic inflation rises faster than world inflation. On the other hand if expansionary policies result in rise in output of non-tradables relative to tradables, there would be a fall in domestic price level, especially in the prices of non-tradables; and consequently, lower inflation given the world prices, would lower REER.

In addition, we introduce a dummy variable representing the devaluation of Fiji dollar in 1988, 1998 and 2009. The dummy variable takes the value of unity in the aforesaid three years; and zero for other years.

The model is written as follows:

$$LREER=f\,(LAID, LREM, LOP, LDCGDP, D), \tag{1}$$

where,

LREER= Real effective exchange rate in index number;

LAID=Aid as percentage of GDP;

LREM=Remittance inflows as percent of GDP;

LOP=Exports and imports as percent of GDP;

LDCGDP=Domestic credit as percent of GDP;

D=Dummy variable for those years when Fiji's currency was devalued assuming the value of unity; and zero for other years.

4.1. Bounds Testing Approach

Since the number of observations is not large enough for estimating a long-run money and output model, we resort to the autoregressive distributed lag (ARDL) procedure, developed by Pesaran *et al*. (2001). The ARDL bounds testing model is a general dynamic specification, which applies lags of the dependent variable and the lagged and contemporaneous values of the explanatory variables, through which short-run impacts can be directly assessed and long-run relationship indirectly estimated.[3] For econometric analysis, all variables are duly transformed into their natural logs with a view to eliminating any likely problems of heteroscedasticity.

An ARDL model of Equation (1) is constructed as follows:

$$\begin{aligned}\Delta LREER_t = {} & \alpha_0 + \beta_1 LREER_{t-1} + \beta_2 LAID_{t-1} + \beta_3 LREM_{t-1} + \beta_4 LOP_{t-1} \\ & + \beta_5 LDCGDP_{t-1} + \sum_{i=1}^{p} \beta_{1i} \Delta LREER_{t-i} + \sum_{i=0}^{p} \beta_{2i} \Delta LAID_{t-i} \\ & + \sum_{i=0}^{p} \beta_{3i} \Delta LREM_{t-i} + \sum_{i=0}^{p} \beta_{4i} \Delta LOP_{t-i} + \sum_{i=0}^{p} \beta_{5i} \Delta LDCGDP_{t-i} + u_t. \quad (2)\end{aligned}$$

There are two steps in examining the relationship between REER, LAID, LREM, LOP and LDCGDP and D. First, we estimate Equation (2) 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 equal to zero. Hence, bounds test is based on the F-statistics (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 ($H_a: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0$).

Since the F-statistics used for this test has a nonstandard distribution, Pesaran *et al*. (2001) have generated two different sets of critical values for given significance levels. The first set assumes that all variable are integrated of order zero, I(0), and the second set assumes all variables are integrated of order one, I(1). If the computed F-statistic is greater than the upper critical bounds value, then the null hypothesis is rejected. In contrast, if the computed F-statistic is smaller than lower critical bounds value, it indicates no long-run relationship between variables. If the computed F-statistic lies between lower and upper bounds values, then the test becomes inconclusive.

[3] 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 (2005), Akinlo (2006), among others for the advantages and applications of ARDL.

4.2. Granger Causality Test

We conduct the Granger causality test in the parsimonious vector error correction model (PVECM) framework to investigate the short-run causality relationship between real output, remittances, private credit and exports. In PVECM framework, we regress the change in variables (both endogenous and exogenous) on lagged deviations and it can be written as follows:

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

where $\Delta Z_t = [\Delta REER, \Delta LAID, \Delta LREM, \Delta LOP, \Delta LDCGDP]'$, $\Pi = -\left(1_m - \sum_{i=1}^{p} A_i\right)$ and $\Gamma_i = -\left(1 - \sum_{j=1}^{i} A_j\right)$. For $i = 1, \ldots, p-1$, Γ_i reflects the short run effect of the changes in Z_t.

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

The Granger causality test is conducted by computing the F-statistics (Wald test) based on the null hypothesis that the set of coefficients (Γ_i) on the lagged values of explanatory variables are not significantly different from zero. If the null hypothesis is rejected, then it is concluded that the explanatory variables cause the dependent variables. If Π is found not significant based on the t-statistics, then both the explanatory and dependent variables do not have a stable relationship in the long run.

4.3. Data

Data for the empirical study are drawn from three sources: World Bank (2014) for AID and REM, both as percentages of GDP; Real effective exchange rate index from International Monetary Fund (2014); and LOP and LDCGDP from Asian Development Bank (2014).

5. RESULTS AND INTERPRETATION

Before entering the variables into regression analysis, we subject them to unit root tests with a view to assessing their stationarity properties. Although the bounds testing procedure does not require any unit root tests, assurance that variables are integrated of the same order would contribute to the robustness of estimates. The test results as reported in Table 4 show that all variables are stationary in their first differences and are integrated of the same order: I(1). Consequently, the suitable procedure for examining the dynamic behaviour of these macroeconomic variables, which are integrated of order 1, is the co-integration test together with an error-correction model.

Table 4. Results of Unit Root Tests

Variable	ADF		Ng and Perron	
	Level	First Difference	Level	First Difference
LREER	-1.458	-3.717**	-4.684	-14.704**
LAID	-2.931	-4.910**	-11.124	-15.269**
LREM	-2.496	-4.606**	-12.630	-12.149**
LOP	-2.158	-5.700**	-7.831	-15.451**
LDCGDP	-1.798	-7.025**	-8.240	-14.963**

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

5.1. Results of Bound-Tests

The results of the bounds test are reported in Table 5. The results confirm the existence of a long run relationship amongst the variables (aid, remittance, openness, and government policies) when REER is the dependent variable. The computed F-statistics are higher than the upper critical values provided by Pesaran *et al.* (2001) and Narayan (2005) at 1% significance level. Hence, the null hypothesis of no cointegration is rejected for this equation. However, the corresponding computed F-statistics in equations with other variables, as dependent variables, are found statistically not significant. The results also confirm that there is only one cointegration relationship; and the cointegration equation is the one with REER as dependent variable; and the relationship flows only from the explanatory variables, LAID, LREM, LOP and LDCGDP to LREER.

Having confirmed the existence of a long-run relationship between real effective exchange rate and aid, remittance, openness, and domestic credit as ratio of GDP, we proceed to estimate the long run equation by using the autoregressive distributed lag model (ARDL). The long-run equation is shown as follows:

$$LREER = -45.391 + 2.384LAID^{***} + 0.209LREM^{*} + 7.558LOP^{***} + 2.862LDCGDP^{***}$$
$$t = \quad (-3.865) \quad (4.198) \qquad (2.297) \qquad (3.591) \qquad (4.571)$$
$$-0.102D^{*}.$$
$$(1.833)$$

The results show that all explanatory variables except the dummy variable have emerged with positive coefficients which are also statistically significant.[4] These results

[4] In our regressions, we included TREND variable in Equation (1). However, as it was found that the TREND variable was not significant, it was dropped from the estimation procedure. Results would be made

confirm the hypotheses that aid, remittances and openness of the economy lead to appreciation of the real exchange rate. As regards economic policies of the government, proxied by domestic credit as a ratio of GDP, we note that since the sign of the estimated coefficient is positive, government policies, both fiscal and monetary, lead to an increase in demand for non-tradables such as labour, water and electricity, contributing to a rise in domestic price level given the world price level. It is clear that expansionary policies are unambiguously responsible for rise in REER. The dummy variable, representing the devaluation of Fiji dollar in 1988; 1998 and 2009 has the expected negative sign.

Table 5. Results of Bound Tests

Dependent Variable			Computed F-statistic	
LREER			8.771***	
LAID			2.680	
LREM			1.199	
LOP			1.515	
LDCGDP			1.511	
	Pesaran *et al.* (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
10 per cent	2.26	3.35	2.578	3.858

Notes: [a] Critical values are obtained from Pesaran *et al*. (2001), Table CI(iii) Case III: Unrestricted intercept and no trend, p. 300. [b]Critical values are obtained from Narayan (2005), Table case III: unrestricted intercept and no trend, p. 10; *, ** and *** indicate significance at 10%, 5% and 1% levels, respectively.

A number of diagnostic tests such as Jacque-Bera normality test, serial correlation LM test, heteroskedasticity ARCH test, and Ramsey RESET mis-specification test were performed. The results perform reasonably well as the disturbance terms are normally distributed and serially uncorrelated with homoscedasticity of residuals, confirming the model has a correct functional form. Besides, the CUSUM and CUSUM of Squares plot show that the parameters of the model are stable over time.[5]

available upon request.

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

5.2. Granger Causality Tests

Since it is confirmed that there is one cointegration between the variables, we examine the short-run dynamic causal relationship by using Granger causality tests. The results are reported in Table 6. The results suggest the existence of a unidirectional relationship in the long run running only from foreign aid, remittances, openness and government policy variable to real exchange rate. The error-correction term (ECT) in the equation with real exchange rate as dependent variable has the correct, negative sign, which is also statistically significant at 1% level. In contrast, ECT in other equations is not statistically significant. This duly confirms the existence of only one cointegration vector, as was indicated by bounds test results.

Looking at the short-run causality linkages, we note that there is a unidirectional linkage running from all explanatory variables to real exchange rate. Furthermore, it is shown that all variables also influence real exchange rate in the short run as well.

Table 6. Granger Causality Tests

	F-statistics					ECT
	$\Delta LREER$	$\Delta LAID$	$\Delta LREM$	ΔLOP	$\Delta LDCGDP$	(t-statistics)
$\Delta LREER$	-	5.605***	16.139***	9.869***	14.093***	-0.1077***
						(-3.343)
$\Delta LAID$	3.428**	-	8.906***	8.849***	3.742**	-0.1276
						(-0.962)
$\Delta LREM$	1.877	6.039***	-	2.591*	0.263	-0.2622
						(-0.882)
ΔLOP	7.471***	5.957**	3.013*	-	2.118	-0.0165
						(-0.252)
$\Delta LDCGDP$	5.564**	3.160*	3.790**	2.987*	-	-0.0409
						(-1.533)

Notes: *, ** and *** indicate significance at 10%, 5% and 1% levels, respectively.

6. SUMMARY AND CONCLUSIONS

PICs have been large recipients of unrequited capital transfers from the rest of the world. These transfers are mainly in terms of foreign aid from their former colonial masters. In recent years, there has been a rising trend in remittances from islanders working overseas as migrants on temporary work permits as well as from those who have now become permanent overseas residents. The increasing trend in the inward flows of moneys have caused concerns among international agencies in regard to the possibility of giving rise to appreciation of exchange rate hurting the competitiveness of exports, a phenomenon known as Dutch disease. However, most of the empirical studies

conducted so far for testing the validity of this phenomenon adopted a cross-country panel investigation approach. The panel analysis turned out to produce a variety of outcomes and in some cases mostly of ambiguous nature.

Our study, on the other hand, focuses on a single island country, namely Fiji. Because of a better organized data collection and reporting, it has now accumulated a much longer period of data series on relevant variables. Employing series data covering 33 years (1980-2012) and utilizing the bounds testing approach, the study finds existence of strong evidence of direct and significant link between two capital inflows (both aid and remittance) and appreciation of domestic currency. Additionally openness of the economy and expansionary government policies, both fiscal and monetary, by raising the domestic price level through bidding up of prices of non-tradables, also contribute to rise in appreciation of Fiji dollar.

The net result is the reduction in the competiveness of Fiji's exports. This clear conclusion establishes the validity of the Dutch disease hypothesis for one PIC country, unlike the ambiguous conclusions stemming from the panel studies undertaken in the past.

The policy implications are clear and straight forward. As the ratio of domestic prices to world price level is a determinant of real exchange rate and since the world price level is beyond the control of Fiji, the government should control inflationary pressures on domestic price level. Further, as one of the components of domestic price level index takes into account the prices of non-tradables including water, electricity, labour services and communications, supply of the output of non-tradables has a critical role. Further, expansionary government policies should focus not only on stepping up output of non-tradables but also domestic agricultural output including rice, vegetables, fruits and milk production, since Fiji has abundant area of arable land which lies unutilized due to land tenure rigidities. The government would do well by taking measures to remove these rigidities and step up domestic production of agricultural products. The stress should be on lessening domestic inflation.

REFERENCES

Acosta, P.A., E.K. Lartey, and F.S. Mandelman (2009), "Remittances and the Dutch Disease," *Journal of International Economics*, 79(1), 102-116.

Adenauer, I., and L. Vagassky (1998), "Aid and the Real Exchange Rate: Dutch Disease Effects in African Countries," *Intereconomics: Review of International Trade and Development*, 33(4), 177-185.

Akinlo, A.E. (2006), "The Stability of Money Demand in Nigeria: An Autoregressive Distributed Lag Approach," *Journal of Policy Modeling*, 28(4), 445-452.

Amuendo-Dorrantes, C., and S. Pozo (2004), "Workers' Remittances and the Real

Exchange Rate: A Paradox of Gifts," *World Development*, 32(8), 1407-1417.
Asian Development Bank (2014), *Key Indicators*, Manila: Asian Development Bank.
Avalos, N., V.G. Stuva, A. Heal, L. Karoe, and N. Okazoe (2013), "PNG and Natural Resource Curse," Working Paper, 128, Bangkok: UN Economic and Social Commission for Asia and Pacific.
Bayango, V., and K. Jansen (2009), "Remittances and Competitiveness: The Case of the Philippines," Working Paper Series, 492, The Hague: Institute of Social Studies.
Bourdet, Y., and H. Falck (2006), "Emigrants' Remittances and Dutch Disease in Cape Verde," *International Economic Journal*, 20(3), 267-284.
Brown, R.P.C. (2008), *Remittances and Development in the Pacific*, Bangkok: United Nations Economic and Social Commission for Asia and Pacific.
Browne, C. (2006), *Pacific Island Economies*, Washington, D.C.: International Monetary Fund.
Chang, T., W. Fang, and L.F. Wen (2001), "Energy Consumption, Employment, Output and Temporal Causality: Evidence from Taiwan Based on Cointegration and Error-Correction Modelling Techniques," *Applied Economics*, 33, 1045-1056.
Corden, W.M. (1984), "Booming Sector and Dutch Disease Economics: Survey and Consolidation," *Oxford Economic Papers*, 36(3), 359-380.
Fielding, D. (2007a), "Aid and Dutch Disease in the South Pacific," World Institute for Development Economic Research Paper, 2007/50, United Nations University.
_____ (2007b), "Aid and Dutch Disease in the South Pacific," Economics Discussion Papers, 0703, Dunedin: Department of Economics, University of Otago.
_____ (2010), "Aid and Dutch Disease in South Pacific and other Small Island States," *Journal of Development Studies*, 46(5), 918-940.
International Monetary Fund (2014), *International Financial Statistics*, CD ROM 2014, Washington: IMF.
Lartey, E., F. Mandleman, and P. Acosta (2012), "Remittances, Exchange Rate Regimes and the Dutch Disease: A Panel Data Analysis," *Review of International Economics*, 20(2), 377-395.
Lopez, H., L. Molina, and B. Bussolo (2008), "Remittances and the Real Exchange Rate," World Bank Policy Research Working Paper, 4213, Washington, D.C.
Narayan, P.K. (2005), "The Saving and Investment Nexus for China: Evidence from Cointegration Tests," *Applied Economics*, 37, 1979-1990.
Narayan, P.K. and R. Smyth (2005), "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.
Pesaran, H., Y. Shin, and R.J. Smith (2001), "Bounds Testing Approaches to the Analysis of Level Relationships," *Journal of Applied Econometric*, 16, 289-326.
Rajan, R.G., and A. Subramanian (2005), "What Undermines Aid's Impact on Growth?" NBER Working Paper, 11657, Washington. D.C: National Bureau of Economic Research.
Ratha, A. (2013), "Remittances and the Dutch Disease: Evidence from Cointegration

and Error-Correction Modeling," Economics Faculty Working Papers, WP/26/2013, St. Cloud State University.

UNESCAP (2013), *Economic and Social Survey of Asia and the Pacific 2013*, Bangkok: UNESCAP.

Vergas-Silva, C. (2009), "The Tale of Three Amigos: Remittances, Exchange Rates and Money Demand in Mexico," *Review of Development Economics*, 13(1), 1-14.

White, H., and G. Wignaraja (1992), "Exchange Rates, Trade Liberalization and Aid: The Sri Lankan Experience," *World Development*, 20(10), 1471-1480.

World Bank (1993), *Pacific Island Economies: Toward Efficient and Sustainable Growth 1: Overview*, Washington, DC: World Bank.

_____ (2012, 2014). *World Development Indicators*, Various Issues, Washington, DC: World Bank.

Mailing Address: T.K. Jayaraman, Department of Economics, College of Business, Hospitality and Tourism Services, Fiji National University, Nasinu, Fiji Islands. E-mail:tkjayaraman@yahoo.com.

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