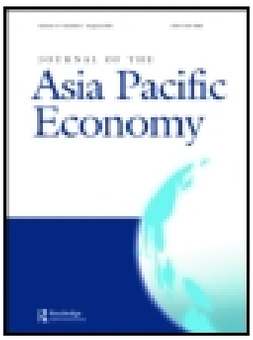

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Is the Dutch disease effect valid in relation to remittances and the real exchange rate in Fiji?

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ABSTRACT

In recent years, increased economic integration and enhanced labor mobility has led to an increasing flow of remittances across the globe. Many scholars over time have explored its positive contributions, while few have investigated its consequences on the recipient economies. A subsequent appreciation of the local currency due to remittances is known as the 'Dutch disease' effect. In this paper, we examine the validity of the 'Dutch disease' effect in the context of Fiji and find that remittances do not result in the Dutch disease effect in the long run.

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1. Introduction

The twenty-first century, marked with increased economic integration and enhanced labor mobility, has seen increasing flow of remittances across the globe. This global trend in the flow of remittances has undoubtedly led to growing interest in economic and social contributions of remittances to the recipient economies. Literature demonstrates that the inflow of remittances has led to positive outcomes on a number of development indicators and has benefitted the society as a whole (see, for example, Acosta et al. 2007, Ratha and Mohapatra 2007 and Gupta et al. 2009). Though remittances in many instances help to provide financial resources for poor households, reduce the level of poverty, enable better access to healthcare and education, among others, they are also found to have some critical adverse impact on the recipient economy. Inflow of remittances in the absence of Fiji Central Bank does not intervene in terms of the open market operation, can cause domestic currency to appreciate. Literature describes this is as the 'Dutch disease effect'. A large inflow of remittances causes a significant change in spending and resource allocation among the tradable and non-tradable sectors in the economy. This has implications by causing an increase in the real wages and other factor costs in the tradable sector. As a result, this causes an appreciation of the local currency and subsequently erodes the international competitiveness of the tradable sector in the domestic economy.

The focus of this study is to examine the effect of remittances on the real exchange rate in Fiji. Fiji is undeniably an exceptional candidate for this particular study as data show

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that Fiji records the highest flow of remittances among the Pacific Island Countries in recent years. It has also recorded net deficits in migration rates which imply that there are more people leaving Fiji than those entering Fiji. According to Brown (2008), 87 percent of households with a migrant member receive remittances, while on the aggregate level around 42 percent of total households in Fiji receive remittances. As a result, the flow of remittances in Fiji has significantly increased from US$5 million in 1980s to more than US$190 million in 2012. This effectively translates in an increase in the share of remittances from less than 1% of gross domestic product (GDP) in 1980 to around 5% of GDP in 2012.

The remainder of the paper is organized as follows: next section presents the empirical model specification along with the empirical results. The final section concludes with policy implications emerging from the study.

2. Empirical specification, results and discussion

We use the following long-run model to analyze the exchange rate data for Fiji.

$$\ln \mathrm{REER}_t = \beta_0 + \beta_1 \ln \mathrm{REM}_t + \beta_2 \ln \mathrm{GDP}_t + \beta_3 \ln \mathrm{ODA}_t + \beta_4 \ln \mathrm{OIL}_t + \mu_t \quad (t = 1979 \quad \text{to} \quad 2012), \tag{1}$$

where REER refers to the real effective exchange rate, REMis the total personal remittances received from migrants and has been deflated with appropriate price deflator to arrive at its real value, GDP represents real GDP, ODA captures the net official development assistance and official aid received, OIL represents world oil price per barrel in US$ while $\beta's$ capture the coefficients of the respective variables in the model. Specifically, REERis defined as a nominal effective exchange rate adjusted for foreign and domestic price levels indexed at 2005 as base year, i.e. NEER $*$ (P^f/P^d). NEER is the trade weighted average of Fiji's nominal exchange rate with its trading partner countries expressed as the price of foreign currency in domestic currency, while P^f and P^d represent foreign and domestic price levels, respectively.

The sign of β_1 can be either negative or positive. Based on the traditional argument in support of the Dutch disease hypothesis, it is expected to be negative suggesting appreciation of the domestic currency. On the other hand, if increased remittances income is primarily used for boosting domestic capacity and results in increase in production, it can ultimately drive domestic prices down and consequently put less or no pressure on the domestic currency to appreciate. This shall result in a positive sign for β_1. The impact of real GDP on the local currency is captured by β_2.

Since the ODA variable is another foreign capital inflow into Fiji, ODA will affect the exchange rate in a similar way as remittances and the sign of β_3 is expected to be negative if the Dutch disease hypothesis is true.

We also incorporate in our model the influence of international price shocks to Fiji's real exchange rate. This is being captured by the world oil price (OIL) variable. Though this variable has not largely been accounted for when modeling inflation for Fiji (see Paul et al. 2014), many scholars and institutional publications[1] strongly argue the use of oil price variable to model inflation in the context of countries in the Pacific region. As a result, it becomes particularly important to incorporate world oil price to model real exchange rate as this affects inflation rates in Fiji. A dummy variable (dev) to capture the

impact of devaluation on the exchange rate is also incorporated. This is represented by a value '1' in the year of devaluation[2] while a value of '0' for other years. All data in Equation (1), except for world oil price, have been sourced from the World Bank's World Development Indicators database. The world oil price has been sourced from International Financial Statistics database from the International Monetary Fund. All the values are expressed in real Fijian dollars expressed in 2005 prices.

Hereafter, following the works of Johansen (1988) and Johansen and Juselius (1990), we propose to use the vector error correction model (VECM) to test the long- and short-run relationship among the variables in our model. The testing procedure involves three steps of testing for the existence of unit root, cointegration test followed by estimating the short- and long-run relationship among the variables in the model. Hence, the model specification in an error correction form is as follows:

$$\begin{aligned}\Delta \ln \mathrm{REER}_t = {} & \gamma_0 + \gamma_1 \mathrm{ECT}_{t-1} + \gamma_2 \Delta \ln \mathrm{REER}_{t-1} + \gamma_3 \Delta \ln \mathrm{REER}_{t-2} + \gamma_4 \Delta \ln \mathrm{REM}_{t-1} \\ & + \gamma_5 \Delta \ln \mathrm{REM}_{t-2} + \gamma_6 \Delta \ln \mathrm{GDP}_{t-1} + \gamma_7 \Delta \ln \mathrm{GDP}_{t-2} + \gamma_8 \Delta \ln \mathrm{ODA}_{t-2} \\ & + \gamma_9 \Delta \ln \mathrm{ODA}_{t-2} + \gamma_{10} \Delta \ln \mathrm{OIL}_{t-1} + \gamma_{11} \Delta \ln \mathrm{OIL}_{t-2} + \gamma_{12} \mathrm{dev}_t + \varepsilon_t, \end{aligned} \tag{2}$$

where ECT_{t-1} is the error correction term lagged one period. The sign and size of the coefficient will reflect the direction and speed of adjustments in the dependent variable to deviations from the linear long-run relationship. The lagged difference term describes the effects of n past values on the dependent variable. Hence, the lagged change in independent variables which are captured by γ'scan be interpreted as representing the short-run causal impact. ε_t is the random error term.

We begin our empirical analysis with the test of unit root properties of the variables using the Augmented Dickey Fuller tests by paying appropriate attention to the correct specification for each of the variables. The major finding is that we are not able to reject the unit root null hypothesis for the variables in the level form at the conventional significance level. However, when the variables are taken in their first difference form, we find that all the variables in the model are integrated of order one, i.e. I(1). This depicts the possibility of a long-run relationship among the variables, so we also carry out tests for cointegration using the trace statistics. The results using trace statistics while allowing for linear deterministic trend conclude that there exists at least one cointegrating equation. This suggests the presence of co-movements among the variables and indicates long-run stationarity in our model.

After finding at least one cointegration relationship among the variables in the model, we proceed to examine the long-run coefficients using VECM as illustrated in Equation (2). The long-run elasticities are reported in Table 1.

Table 1. Estimates of the long-run coefficients.

ln REER	ln REM	ln GDP	ln ODA	ln OIL	Constant
1.000	0.026 (1.131)	0.888 (7.888)***	0.482 (6.509)***	−0.168 (−7.808)***	−23.171

Note: t statistics are in parenthesis; (*), (**) and (***) denote significance at the 10%, 5% and 1% level, respectively.

By normalizing the coefficient of lnREER to one, all the variables except world oil prices are found to be positively related to the real exchange rate. The main variable of interest in the model, lnREM,is found to have insignificant impact on real exchange rate with a magnitude of 0.026.[3] The insignificant impact of remittances on the exchange rate implies that in the long run, remittances inflows do not have any impact on the real exchange rate and thus we reject the Dutch disease effect for Fiji's economy.

We argue that this is a result of large remittances money being channeled to productive investments which put little to no pressure on exchange rates to appreciate. Waqabaca (2000) is of the view that the Fijian economy has a reasonably well-developed financial system that ensures a smooth channel of household funds into its investment opportunities. This translates into less pressure for the domestic currency to appreciate. Our results are also supported by the study undertaken by Barajas et al. (2010) for more than 140 countries and by Lin (2010) in the context of Tongan economy. His study finds that increased remittance flows to Tonga has insignificant impact on real effective exchange rate over the 1994Q1−2009Q1 period. However, the finding of this study contradicts with the previous findings of Lartey et al. (2012) which included subsample data (1990−2003) of the current paper (1979−2012) on developing countries that included Fiji. Hence, further analysis using the current methodology shows that the results of Lartey et al. (2012) hold over the 1990−2003 period.[4] The results of this study imply that by including a longer term and new data makes the difference in the findings due to various domestic and global economic changes that happened after 2003.

Furthermore, the income variable represented by real GDP per capita is found to be positive and significantly affecting the real exchange rate. The third variable, net official development assistance and official aid received, is also found to have positive and significant impact on the exchange rate. However, as expected, the impact of oil price on real exchange rate is negative and noted to cause local currency appreciation. We argue that due to Fiji's high dependence on oil imports, increase in world oil price puts increasing pressure on domestic price level to rise which consequently leads to real exchange rate appreciation.

Furthermore, in the short run, the results show that remittance inflow is found to cause significant depreciation of the real exchange rate but appreciates modestly at lag 2 (Table 2). This indicates some degree of mean reversion. Hence, the mixed response in the short run appears to wither away significant impact and ends up having insignificant

Table 2. Estimates of the short-run coefficients.

$$\begin{aligned}\Delta\ln REER_t = &-0.011 - 0.199ECT_{t-1} + 0.349\Delta\ln REER_{t-1} + 0.237\Delta\ln REER_{t-2} + 0.071\Delta\ln REM_{t-1}\\ &(-1.438)\quad(-2.627)^{**}\qquad(3.073)^{***}\qquad(1.892)^{*}\qquad(3.808)^{***}\\ &-0.027\Delta\ln REM_{t-2} - 0.396\Delta\ln GDP_{t-1} + 0.295\Delta\ln GDP_{t-2} - 0.093\Delta\ln ODA_{t-1}\\ &(-1.390)\qquad(-2.499)^{**}\qquad(1.904)^{*}\qquad(-2.847)^{***}\\ &-0.038\Delta\ln ODA_{t-2} - 0.004\Delta\ln OIL_{t-1} - 0.036\Delta\ln OIL_{t-2} + 0.174dev_t\\ &(-1.222)\qquad(-0.141)\qquad(-1.480)\qquad(10.089)^{***}\end{aligned}$$

Diagnostics: $R^2 = 0.891$; Adjusted $R^2 = 0.819$; σ(standard error of equation) = 0.026; $\chi^2(2)$(statistics for normality test) = 0.430; $\chi^2(23)$(statistics for heteroskedasticity test) = 27.794; LMtest statistics = 20.281.

Note: t statistics are in parenthesis; (*), (**) and (***) denote statistical significance at the 10%, 5% and 1% level, respectively.

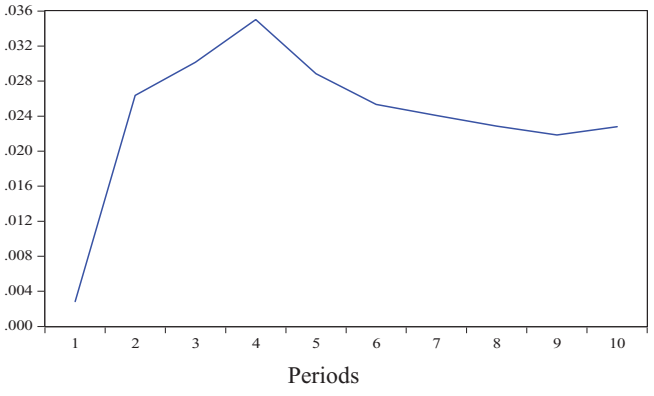

Figure 1. Response of the real effective exchange rate to generalized one standard deviation innovation in the inflow of remittances to Fiji.

impact in the long run. For changes in GDP in the short run, a rise in income per capita leads to appreciation of the real exchange rate at period 1 while at period 2 it causes significant depreciation of the same. This continues to be the case in the longer term which effectively translates in causing significant depreciation of the real exchange rate in the long run as well.

Increase in ODA is found to be negatively and significantly putting pressure on the real exchange rate to rise at lag 1 but the impact is positive and insignificant at longer lags. Rise in the price of oil is estimated to cause appreciation of the real exchange rate but has insignificant impact in the short run. The devaluation dummy is found to be significantly reducing the real exchange rate. The regression result reveals that on average, devaluation by 10 percent significantly reduces real exchange rate by 1.7 percent in the short run. The error correction term, ECT_{t-1} is also noted to be negative and significant as expected. As far as the diagnostic tests of the model is concerned, the model has reasonably high adjusted *r*-squared with correct functional form, no problem of serial correlation, no issues with heteroskedasticity and no problem of non-normality of errors.

Further analysis using the impulse response function shows similar findings as suggested by the error-correction model (Figure 1). The results show that due to generalized one standard deviation increase in the flow of remittances to Fiji, its real exchange rate experiences short-run depreciation followed by currency appreciation in the medium term. However, the results at the longer lag lengths suggest modest depreciation of the exchange rate beyond period nine. The slight increase in the response of real exchange rate due to remittances at later periods also lends support to the insignificant and depreciating effects of remittances on the real exchange rate in the long run. Therefore, currency appreciation due to remittances in Fiji is only transitory and does not last indefinitely in the long run.

3. Concluding remarks and policy implications

Using the VECM technique, this study finds that remittances do not have any impact on the real effective exchange rate in the long run, and thus we reject the claim on the Dutch disease effect as a result of remittances in Fiji.

We argue that this is a result of large remittances being channeled to productive investments to boost domestic capacity which put little to no pressure on the domestic exchange rates to appreciate. Though the results show that there is some evidence of currency appreciation due to increase in remittances to Fiji in the short run, this does not continue to be the case in the long run. Further analysis using the impulse response function supports the estimates of the error-correction model. Therefore, currency appreciation due to remittances in Fiji is only transitory and does not last indefinitely in the long run.

The results of this study are bound to assist policy makers to better understand the implications of remittances and put in place more strategic policies to promote remittances in the country. This is because increase in remittances in Fiji helps to improve Fiji's international competitiveness.

Notes

1. See, for example, RBF (2005), PFTAC (2010) and Peiris and Ding (2012).
2. Fiji's currency has been devalued in 1987, 1998 and in 2009.
3. The 95% confidence interval for the regression coefficient estimate is between −0.021 and 0.073.
4. A bivariate error-correction model has been used to explain the effect of remittances on the real effective exchange rate over the 1990−2003 periods in Fiji. The results show that the increase in remittances causes significant appreciation of Fiji's exchange rate in the long run. Results are available on request from the authors.

Disclosure statement

No potential conflict of interest was reported by the authors.

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