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Role of Financial Inclusion in the Remittances and Output Nexus:
An Empirical Study of Fiji over 1980-2012

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Hong Chen and T.K Jayaraman[*]

Abstract

Amongst the three kinds of non-debt creating capital transfers which are welcomed by the 14 Pacific island countries (PICs) for supplementing their limited domestic savings, remittances presently top the list, the other two being foreign aid and foreign direct investment inflows. The latter two have often been subject to high volatility. On the other hand, inward remittances have been remarkably steady and rising. Remittances have been beneficial in terms of supplementing domestic incomes of poor families and reducing poverty in rural areas. In the long run, however, contribution of remittances to economic development is contingent upon financial sector development (FSD). Aware of the critical need for mobilization efforts for savings and investment in growth enhancing areas, PICs have been concentrating their efforts for fostering FSD and promoting financial inclusion in rural areas. This paper seeks to assess the role of FSD in the nexus between remittances and output by taking up Fiji as a case study. The choice of the country for study is dictated by the availability of data series (1980-2012) on a consistent basis. The study findings show that remittances and financial development have significantly played positive roles; however, the financial system is shallow since the interaction term has a negative sign indicating that remittances and financial development are substitutes for each other. There is no complementarity relationship between remittances and financial development at the present stage. It would take some time as developments in other segments of financial sectors are lagging behind.

Keywords: Remittances, financial sector development, output, Fiji, cointegration

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1. Introduction

Pacific island countries[2], since their political independence in the 1970s, have been among the world's largest recipient countries of official development assistance, popularly known as foreign aid. In the late 1990s, the focus of donor countries was turned on rehabilitation of the former Soviet republics in particular and east European states in general. The donors began to cut down foreign aid to PICs for budgetary support but directed it more towards growth enhancing physical infrastructure.

In recent years, notably from the early 2000s, steadily rising inward remittances sent by increasing number of migrant islanders residing and working in Australia, New Zealand and United States and Europe, have exceeded aid inflows to PICs. On the other hand, annual foreign direct investment (FDI) inflows have been less and volatile. Annual FDI inflows to PICs were confined to the tourism sector, in particular with reference to hotel and resort facilities, as production related investments were not attractive because of smallness of domestic markets.

Thus, remittances have now become more important from the point of supplementing domestic savings as well as adding to real resources of the country, since they are in the form of foreign exchange which would have to be earned under normal circumstances by exporting limited range of exports of goods and services. The nexus between remittances and economic development is according to the conventional wisdom is through consumption by recipient families. Although consumption expenditures on food, clothing and medicines and children's schooling have alleviated poverty incidence to a high degree, rural families in the absence of any avenues for saving by resource mobilization in the rural areas, remittances tend to get frittered away on needless consumption.

If there were opportunities for savings by way of access to financial sector institutions including commercial banks, either for rainy days for future consumption or for possible investment including semi-durable goods, additions to reserves in banks would enable greater flows of credit to would-be investors needing funds. It is well known that well-functioning financial markets, by lowering costs of conducting transactions, facilitate directing remittances to projects that yield the highest return and therefore enhance economic growth (Giuliano and Ruiz-Arranz, 2005). Further, remittances are a substitute for nonexistent credit markets by helping local entrepreneurs bypass lack of collateral or high lending costs and start productive activities on their own (Paulson and Townsend, 2003).

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[2] The 14 Pacific island countries (PICs) 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. Among the 14 PICs, PNG is an outlier as its land, population, natural resources with oil and natural gas and other minerals place the country far ahead of the other 13 countries in terms of high growth potential. Hence our study leaves out PNG from the study focus.

Giuliano and Ruiz-Arranze (2005) in their panel study of about 100 developing countries, which does not include Fiji, make the remittance variable interact with an indicator of financial depth and test the significance of the interaction term. The interaction term in their study emerges with a negative sign and it is also found significant. They argue that in a financially deeper system, the sign would be positive to imply that the growth effects of remittances are enhanced, supporting complementarity of remittances and other financial flows; and a negative and significant sign would indicate that remittances and financial development are substitutes in shallower financial systems. In such conditions of shallowness, remittances, by relaxing liquidity restraints, contribute to economic development in developing countries (Giuliano and Ruiz-Arranz 2005).

There is no study so far in regard to interaction between remittances and the financial sector in PICs. The objective of this paper is to fill the gap by undertaking a case study of Fiji over a period of 33 years (1980-2012). The rest of the paper is organized as follows: Section 2 reviews the trends in remittances; Section 3 gives a brief background of Fiji's economy and some stylish facts; Section 4 describes the empirical model and data sources; Section 5 discusses the results; and Section 6 concludes with some policy implications.

2. Remittances in the Pacific

While foreign aid inflows have been declining for one reason or another, the other form of unrequited transfer of resources is remittances. These transfers have become steady and growing during the last two decades. It has been noted by several studies including World Bank (2006) and Browne and Mikeshima (2007). These studies highlight the growing potential of temporary migration schemes for unskilled citizens of small remote islands, which were introduced in late 2000s, as an experimental measure in respect of a few PICs. These schemes, which now cover major PICs including Fiji, are expected to be mutually beneficial as there is a serious shortage of supply of labour to work on orchards in Australia and New Zealand.

Remittances have been found to be a boon for households in Pacific islands as elsewhere since they have been supplementing disposable incomes of the recipient families (Chami and Fullenkamp 2013). They are spent on consumption of clothing, food, medicine and shelter. They have also enabled them to invest in education and health care, besides investments in semi durable goods. They are also a support to some families to undertake simple food processing microenterprises such as pickles, chutney and condiments for local markets, since these families find out remittances are a source of funding new production opportunities for commercial purposes.

As remittances relax credit constraints imposed by undeveloped financial sectors, governments realize immense potential of remittances in triggering entrepreneurial efforts and are now encouraging financial institutions to help in channeling remittance inflows through formal banking channels. Banks have responded in turn by opening more branches in urban areas as well as new branches in rural areas and introducing mobile banking in inaccessible areas. These efforts are expected to facilitate enhanced financial development by realizing greater economies of scale in financial intermediation. Table 1 shows Samoa and Tonga are the largest recipients of remittances as percent of GDP.

Table 1: PICs: Remittances (percent of GDP) over 1980-2012

Year	Fiji	Samoa	Solomon Is.	Tonga	Vanuatu
1980-1989 (ave)	1.66	28.16	0.15	23.14	6.63
1990-1999 (ave)	1.55	24.50	0.41	18.10	7.61
2000-2004 (ave)	4.95	18.64	1.34	31.15	7.47
2005-2009 (ave)	5.73	20.31	0.65	27.16	1.37
2010	5.39	21.31	0.25	20.58	1.68
2011	4.27	22.02	0.22	16.51	2.77
2012	4.72	23.21	1.72	12.63	2.80

Source: World Bank's World Development Indicators database (2015).

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. This restricts availability of land and has been a deterrent to land based investment projects.

In addition, interest rate differentials have not played any role. There are no financial assets which 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 policies have limited scope for influencing short-term capital inflows (Morling and Singh, 2006).

3. Fiji: Some Stylish Facts

3.1 Background of the Economy

Fiji amongst the 14 PICs is the only country which is classified as an upper middle income country[3]. Its per capita is US$4375 per annum, while the other PICs are classified as low income countries, with per capita incomes below the threshold level at US$1025 per annum. Selected key indicators of Fiji are presented in Table 2.

Table 2: Fiji: Selected Key Indicators

Indicator	Value
Land Area (Sq.km.'000)	18270
Population in '000 (2013)	881
Per Capita GDP (US$) Current prices (2013)	4375
Aid Per Capita in US$ (2012)	81.2
Aid as percentage of GDP (2012)	2.7
Human Development Ranking (2013)	88/187
Annual Average Growth Rate (%) (2009-13)	1.9
Annual Average Inflation (%) (2009-13)	4.8
Overall Budget Balance (% of GDP)(2009-13)	-7.4
Current Account Balance (% of GDP) (2009-13)	-6

Source: World Bank's World Development Indicators database (2015).

Fiji has been traditionally the least recipient of foreign aid amongst PICs. Its relatively broad based tax system along with a significantly large manufacturing sector has enabled Fiji to depend much less on aid. In more recent times aid has decreased, as the metropolitan countries have imposed sanction sand reduced aid flows following the military coups of 2000 and 2006. The continued isolation of the country by donors since 2006 is the chief reason for declining annual aid flows to Fiji.

On the other hand, increased migration over the last two decades of skilled people, instigated initially by the two military coups of 1987 and continued by uncertainties in political environment after the 2006 coup, led to rise in remittances. In regard to FDI, despite the initial adverse impacts of the military coup, some initiatives by the interim government in regard to tax reforms, adoption of investor friendly policies, and restoration of stability encourage inflows of FDI in mineral and tourism sectors (see Tables 3 and 4).

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[3] This is as per World Bank Classification based on 2014 data: Upper middle income countries GNI per capita is $4,086 to $12,615. Fiji's GNI per capita is US $4302 in 2013. Using GDP 2014, it is $4543 (Reserve Bank of Fiji, 2015).

Table 3: Aid, Remittances and FDI Inflows to Fiji over 1980- 2012

Period/year	Foreign aid per capita (constant US$)	Remittances per capita (constant US$)	FDI per capita (constant US$)
1980-89 (ave)	38.7	146.1	58.4
1990-99 (ave)	47.2	108.6	96.6
2000-04(ave)	171.3	82.8	107.4
2005-09(ave)	208.3	89.8	314.5
2010	195.0	101.8	411.1
2011	157.5	89.8	421.2
2012	175.9	70.8	258.4

Source: World Bank's World Development Indicators database (2015).

Table 4: Fiji: Per capita GDP Growth Rate, and Aid, Remittances and FDI

Period / year	Growth rate (percent of GDP)	Foreign aid (percent of GDP)	Remittances (percent of GDP)	FDI (percent of GDP)
1980-89 (ave)	-0.37	5.4	1.4	2.1
1990-99 (ave)	2.06	3.6	1.5	3.2
2000-04(ave)	1.66	2.4	4.9	3.0
2005-09(ave)	-0.54	2.5	5.7	8.6
2010	1.99	2.8	5.4	11.4
2011	1.84	2.4	4.3	11.4
2012	1.04	1.9	4.7	6.9

Source: World Bank's World Development Indicators database (2015).

3.2 Financial Sector Development

Fiji's financial sector consists of six commercial banks, five of which are foreign-owned which were joined in 2014 by one domestic bank; three credit institutions; two life insurance companies, seven general insurance companies; and two unit trusts. As of 31st March 2015, the size of Fiji's financial system stood at F$17.4 billion. In terms of percentages, in 2015 the banking sector was around 51 percent of the financial sector, followed by the state owned Fiji National Provident Funds (FNPF) and the insurance sector at 34 percent, 9 percent other including credit institutions, and others making up the rest. The banking sector recorded the highest growth at 17 percent, due to the entry of one domestic bank into the sector, followed by the FNPF at 7 percent (Reserve Bank of Fiji, 2015).

The banking sector has been dominated by foreign-owned commercial banks but two new entrants (one domestic) in the past two years have increased competition. Overall, the banks remain highly liquid, with liquid assets-to-total assets at 18 percent. Despite some pressures on margins reflecting increased competition, the banks remain highly profitable with a return on equity of 25.6 percent. The capital adequacy ratio stood at 13.7 percent at end-2013, above the minimum prudential requirement of 12 percent (Reserve Bank of Fiji, 2015). As regards coverage by banks in 2014, six banks were operating in Fiji with 71 branches, four agencies and 100 agent banking centres. Fiji's level of access to a formal bank account in Fiji, though it compares well to middle income countries, is low when compared to upper-middle income countries, surveyed as part of the World Bank's Global Findex (Whiteside, 2015).

About 60 percent of adults have a bank account while 27 percent are completely excluded from any type of financial service. Financial inclusion is lower: in the Eastern and Western provinces of Fiji; among women; among *iTaukei* adults; among young adults (aged between 15–20 years); and among agricultural and casual workers (RBF 2015).

About 71 percent of adults saved some money during the previous year, compared with 63 percent of adults in upper middle-income countries in the Global Findex Survey. However, out of the 71 percent of adults who saved in the past year, only 38 percent saved with a formal financial institution and 9 percent with saving clubs. Additionally, 27 percent of the respondents have retirement savings; but these were found to be more with the urban dwellers. Moreover, use of credit in Fiji is at 32 percent, which is lower in comparison to upper-middle income countries at 38 percent. The report highlights that those in the informal strand use shop credit, hire-purchases and borrowing from family and friends more than those who are banked (Whiteside, 2015).

The financial inclusion efforts began in late 2009 and early 2010, with the setting up of National Financial Inclusion Taskforce with the mission to promote easier access to financial services along with the necessary knowledge and skills to best utilize them. The commitment was to reach 150,000 unbanked or underserved Fijians by the year 2014. One of the objectives was incorporating financial education into the Fijian schools' curriculum.

Table 5: Fiji's Financial Inclusion Indicators

Indicator	2010	2011	2012	2013	2014
Access: Demographic[1]					
Number of cash-in and cash out per 10,000 adults2	6.7	8.1	10.6	39.7	41.4
Number of Bank Branches per 10.000 adults	1	1	1	1.1	1.2
Number of ATM per 10,000 adults	3.4	3.5	3.7	4.2	4.6
Number of EFTPOS per 1000 adults	31.4	48.5	59.8	80.2	87.7
Access: Geographic[2]					
Number of cash-in and cash out per 1000 sq.km	22.2	26.9	35.5	133.1	139.1
Number of Bank Branches per 1000 sq.km	3.5	3.5	3.3	3.5	3.9
Number of ATM per 1000 sq.km	11.1	11.6	12.4	14.1	15.4
Number of EFTPOS per 1000 sq.km	103.8	160.8	199.2	268.6	294.9
Usage[3]					
Number of regulated deposit accounts per 10,000 adults	10341	10998	10801	11830	13007
Number of regulated credit accounts per 10,000 adults	1381	1407	1442	1601	1724

Notes:

1. Access refers to the ability of households and firms to use financial products. Figures cover only commercial banks.

2. Adults refer to population that are 15 years and above.

3. Usage refers to use of financial savings and credit products offered by commercial banks and credit institutions.

Source: Reserve Bank of Fiji (2015)

4. Modeling, Data and Methodology

4.1 Model

Our choice of the model stems from the Cobb-Douglas production function, along the lines employed by Luintel *et al.* (2008) and Rao *et al.* (2008) with constant returns and Hicks − neutral technical progress.

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

where

y = per capita output;

A = stock of technology;

k = capital stock per capita;

Since our objective is to study the role of financial sector in Fiji's remittances and growth nexus, we introduce a variable for representing financial sector development indicator variable. Among various indicators including broad money and credit to private sector by banks, our choice is quasi-money, which is the sum of savings and time deposits. Since financial inclusion efforts are directed towards families in the rural areas, who happen to be the majority of the remittance recipients, success of mobilization of rural financial savings is reflected best in the growth of quasi money as a percent of GDP over the period. In addition to quasi money as a variable, we also introduce an interaction term: the product of remittances and quasi money, both expressed as percentages of GDP

It is therefore plausible to assume that:

$$A_t = f(rem_t, quasi_t, rem_t * quasi_t) \tag{2}$$

where,

rem = inward remittances as percent of GDP;

quasi = quasi money as percent of GDP.; and

rem*quasi = interaction term

We enter *rem, quasi, rem*quasi* as shift variables into the production function, noting capital per capita as the fundamental and conditioning variable explaining output per capita:

The Cobb-Douglas production is modified as

$$y_t = A_0 e^{\alpha_1 rem_t + \alpha_2 quasi_t + \alpha_3 rem * quasi_t} k_t^{\alpha_4} \tag{3}$$

The econometric model in natural logarithmic form for estimation purposes is written as follows:

$$ly_t = \alpha_0 + \alpha_1 rem_t + \alpha_2 quasi_t + \alpha_3 rem * quasi_t + \alpha_4 lk_t + \sum \beta_m dum_{mt} + e_t \qquad (4)$$

where ly_t is natural logarithmic real gross domestic product per capita (in US dollars in 2005 prices); lk_t is natural logarithmic real capital stock per capita (in US dollars in 2005 prices). This variable is obtained from Penn World Table 8.1 (Feenstra *et al.*, 2015); rem_t is remittances as percent of GDP; $quasi_t$ is quasi money as percent of GDP; dum_{mt} is a vector of dummy variables (dum_{1t}, dum_{2t} and dum_{3t}) to capture effects of coup in 1987，coup in 2006, and currency devaluation took place in 2009; and e_t is the random error term.

The hypotheses to be tested are: (i) real capital stock per capita is directly associated with per capita GDP and hence sign of *lk* should be positive; (ii) remittances positively influence per capita GDP; and hence the sign of *rem* should be positive ; (iii). The dummy variable for coup is negatively associated with the per capita and hence the sign should be negative; and (iv) dummy variable for devaluation is directly associated with per capita GDP.

On the other hand, there cannot be any a priori conclusion about the interaction term, *rem*quasi* If the interaction term turns out with a positive sign and happens to be significant as well, it would mean that the growth effects of remittances are enhanced in a deeper financial system, supporting a complementary role to growth in per capita GDP. On the other hand, if the interaction term emerges with a negative sign, it would indicate that FSD is shallow and hence remittances act as substitute. If the interaction term is negative and not significant, the two are independent of each other.

4.2 Data

We utilize the data series of capital stock of Fiji in constant prices released from Penn Tables (University of Groningen, 2015). All the other data series are sourced from World Development Indicators (World Bank, 2015). Table 6 presents summary statistics of variables used in the analysis.

Table 6. Summary Statistics

Period / year	Per capita GDP (constant US$)	Capital stock per capita (constant US$)	Remittances (percent of GDP)	Quasi money (percent of GDP)
1980-89 (ave)	2721	7936	1.45	32.52
1990-99 (ave)	3053	8468	1.55	37.13
2000-04(ave)	3436	9364	4.95	28.19
2005-09(ave)	3635	10325	5.73	37.69

2010	3619	10861	5.39	40.14
2011	3686	11059	4.27	36.79
2012	3724	12100	4.72	37.61

Source: Capital stock from Penn Tables and other data series from World Bank (2015).

4.3 Methodology

Methodologies adopted include augmented Dickey-Fuller unit root test and Engle-Granger cointegration test, followed by instrumental variables estimation to control for endoeneity bias caused by endogenous remittances, quasi money supply, and their interaction.

5. Results and Interpretations

5.1 Unit Root and Cointegration Tests

Augmented Dickey-Fuller unit root test results for quantitative variables and estimated residuals in Equation (4) are summarized in Table 7. The null hypothesis of unit root is not rejected for all quantitative variables; however their respective first differences are found stationary at the 5 percent significance level. This provides evidence that quantitative variables are respectively integrated of order one. Furthermore, combination of these quantitative variables as shown in Equation (4) yields stationary residuals; that is, regression results based on Equation (4) will be non-spurious.

Table 7. Unit Root Test Results

Variable	Option	# lags	Test statistic	p-value	Variable	Option	# lags	Test statistic	p-value
ly_t	Drift	2	-0.180	0.4293	Δly_t	Constant	2	-4.328	0.0004
lk_t	Drift	2	2.519	0.9909	Δlk_t	Drift	2	-1.920	0.0324
rem_t	drift	2	-1.109	0.1387	Δrem_t	Noconstant	2	-4.612	0.0001
$quasi_t$	constant	2	-2.281	0.1782	$\Delta quasi_t$	Noconstant	2	-3.107	0.0261
$\hat{e}_{t-1}$	noconstant	0	-5.328						

5.2 Regression Results

Due to potential endogeneity problem in explanatory variables such as remittances, quasi money supply and their interaction, Equation (4) is estimated by using instrumental variables estimators. Excluded instruments are rem_{t-2}, rem_{t-3}, $quasi_{t-2}$, $quasi_{t-3}$, Δly_t, and $rem*quasi_{t-3}$. Validity of instrumental variables is tested by the Sargan test under homoscedasticity or the Hansen J test

with presence of heteroscedasticity; and the endogeneity of problematic regressors is tested by the Hausman test. Four instrumental variables estimators, namely two-stage least squares (2SLS), two-stage generalized method of moments (GMM), k-Class, and limited information maximum likelihood (LIML), are used in estimating Equation (4). Diagnostic tests after OLS estimation of Equation (4) identify the problem of heteroscedasticity (see Table A1 in Appendix); therefore robust standard errors are produced in instrumental variables estimation. Regression results together with tests statistics are summarized in Table 8.

Estimation results are consistently across four regressions in Table 8. Firstly, validity of instruments is confirmed by the Hansen J tests which yield *p*-values as high as above 0.59; secondly, endogeneity of remittances, quasi money supply and their interaction is proved by the Hausman tests which yield *p*-values as low as 0.044 in first two columns. These two tests jointly validate the usage of instrumental variables estimators and ensure consistency of these estimators' estimates.

Given the smallest value of Root MSE in Column (i), results from 2SLS estimation are used for interpretation purpose. It is evident that capital stock per capita, remittances and quasi money supply individually have positive and significant impacts on output per capita in Fiji. More specifically, output elasticity with respect to capital stock is found 0.249, suggesting a 1 percent increase in capital per capita is associated with 0.249 percent increase in output per capita, *ceteris paribus*. Remittances have highly significant impact on output; it is found that a 1 percentage point increase in remittances-to-GDP ratio is associated with 0.081 percent increase in GDP per capita, *ceteris paribus*. Similarly, a 1 percentage point increase in quasi money-to-GDP ratio is associated with 0.007 percent increase in GDP per capita, *ceteris paribus*.

While we find both the financial development indicator, namely quasi money supply, and remittances have individually significant and positive effects on output per capita, the coefficient of the interaction term between remittances and quasi money supply has a negative sign and found significant. This suggests that marginal output effects of remittances and quasi money supply are respectively reduced by their interaction. Furthermore, taking the first differentiation of output with respect to remittances suggests that remittances' marginal effect on output turns negative if quasi money supply exceeds 40.5 percent of GDP. Similarly, quasi money supply's marginal effect on output turns negative if remittances exceed 3.5 percent of GDP. This suggests that, when quasi money supply is higher than 40.5 percent of GDP and at the same time remittances are higher than 3.5 percent of GDP, any further increases in both indicators would actually lead to decline in output, *ceteris paribus*.

Our finding that the marginal impact of remittances on output is declining with the level of financial development is similar to the one reached by Guiliano and Ruiz-Arranz (2005). Our finding seems to imply that remittances have compensated for the inefficiency of the financial systems in Fiji, thereby becoming one of funding sources for productive investments. With this,

we now have one more piece of evidence that remittances and financial sector development are substitutes in developing economies which have shallow financial systems.

Three dummy variables are individually influential on output as well. It is found that military coup in 1987 on average reduced output per capita by 0.117 percentage points, *ceteris paribus*; coup in 2006 slightly increased output per capita by 0.024 percentage points; and currency devaluation in 2009 increased output per capita by 0.106 percentage points.

Table 8. Impacts of Remittances and Financial Sector Development on Labour Productivity

Regressor	(i) 2SLS	(ii) GMM	(iii) k-Class	(iv) LIML
	Coef. (z-stat)	Coef. (z-stat)	Coef. (z-stat)	Coef. (z-stat)
Intercept	5.379 (5.21)***	4.859 (5.35)***	6.357 (3.17)***	6.440 (3.05)***
Rem	.081 (2.85)***	.078 (2.89)***	.150 (2.09)**	.156 (2.02)*
Quasi	.007 (1.90)*	.008 (2.18)**	.017 (1.61)*	.017 (1.58)
rem*quasi	-.002 (-1.88)*	-.002 (-1.91)*	-.003 (-1.73)*	-.004 (-1.69)*
Lk	.249 (2.18)**	.307 (3.03)***	.107 (0.45)	.095 (0.38)
dum_{1t}	-.117 (-2.85)	-.112 (-3.10)	-.197 (-1.93)*	-.204 (-1.87)*
dum_{2t}	.024 (2.09)**	.026 (2.40)**	.022 (1.35)	.022 (1.30)
dum_{3t}	.106 (3.83)***	.096 (3.73)***	.091 (1.95)*	.089 (1.85)*
# observation	30	30	30	30
Centered R^2	0.8742	0.8730	0.6778	0.6555
Root MSE	.04464	.04485	.07144	.07386
Hansen J test Chi^2 (p-value)	1.913 (0.5906)	1.913 (0.5906)	0.813 (0.8465)	0.765 (0.8579)
Endogeneity test Chi^2 (p-	7.909 (0.0479)	7.909 (0.0479)	7.909 (0.0479)	7.909 (0.0479)

Note:

(1) *, **, *** denote significance at the 10%, 5% and 1% significance level respectively.

(2) In Regression (iii) with k-Class estimator, k = 1 + (L – K)/N = 1.1.

6. Conclusions with Policy Implications

This paper undertook an empirical study on the role of financial sector development, represented by quasi money supply, in the remittances and growth nexus of Fiji over a three decade (1980-2012). The methodologies employed include augmented Dickey-Fuller unit root test and Engle-Granger cointegration test, followed by instrumental variables estimation to control for endogeneity bias caused by endogenous remittances, quasi money supply, and their interaction.

The study results confirm remittances and quasi-money are positively associated with growth. However, interaction term turned out with a negative sign indicating that the marginal impact of remittances on growth is decreasing with level financial development. Since it is found statistically significant, the conclusion is beyond doubt that remittances and quasi money act as substitutes in the growth nexus and that there is no complementarity relationship between them. Thus, the financial sector of Fiji is still shallow, despite considerable progress in the financial inclusion efforts.

Although financial inclusion efforts have pushed up the financialization of savings in terms of rise in the ratio of savings and time deposits to GDP, deepening of the financial development depends on all round progress in various segments of financial sector. These segments, aside from banking system include capital markets, market capitalization, bond market and derivatives.

Fiji has a long way to go, but progress is possible with the current initiatives given greater boost in several directions.

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Appendix

Table A1. Diagnostic Tests Results after OLS Estimation of Equation (4)

Test	Null Hypothesis	Test statistic	p-value
Breusch-Godfrey LM test	H_0: error term has no serial correlation	chi2(1) = 0.076	0.7833
Breusch-Pagan/Cook-Weisberg test	H_0: error term has constant variance	chi2(1) = 6.99	0.0082
Ramsey RESET test	H_0: model has no omitted variables	F(3, 20) = 0.91	0.4537
Skewness/Kurtosis tests	H_0: error term is normally distributed	adj chi2(2) = 0.82	0.6630