CASE STUDY
Role of remittances
in Tongan economy

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Abstract

Inward remittances have been a great support to Pacific Island Countries, including Tonga. Aside from being a major source of foreign exchange earnings, they supplement domestic savings and real resources. This paper examines the role of remittances in the economic growth of Tonga's during a 28 year period (1981-2007).

Keywords: Remittances, economic growth, financial sector development, bounds test, Tonga.

Introduction

Inward remittances are important for Pacific Island Countries (PICs)[1], notably for Samoa and Tonga (World Bank 2006). Despite the indications of a world-wide decline in remittance flows due to the current global recession, a report by Asian Development Bank (Asian Development Bank 2009) was more optimistic. It was expected that the implementation of a scheme of temporary work-permits for unskilled farm labour from PICs for fruit picking in the two advanced countries in the region, Australia and New Zealand would ensure a steady source of remittance inflows to PICs.

With increased financial sector development and spread of banking facilities in PICs, a larger proportion of remittances are likely to be kept in interest earning deposits than before. Remittance receipts, thus entering the system through banking channels promote financial intermediation. The paper seeks to investigate the relationship between economic growth and remittances in Tonga, with particular reference to interaction between remittances and financial sector development.

Trends in remittances in Tonga

Table 1 presents the remittances received by PICs, in absolute amounts (US Dollars) as well as in percentages of their respective gross domestic products (GDPs). Amongst PICs, Tonga's annual remittance inflows over the past three decades averaged about 35 per cent of GDP. Further, Tonga is one of the two PICs which figured in the list of world's top 10 remittance receiving countries in 2007 and 2008 (World Bank 2009b).

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[1] The 14 independent Pacific island countries, which are the members of the formal inter-governmental organization, known as Pacific Islands Forum are: Cook Islands, Fiji, Kiribati, Federated States of Micronesia, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.

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

	Fiji	Kiribati	PNG	Samoa	Solomon Islands	Tonga	Vanuatu
1970-1974 (ave)	n.a.	n.a.	n.a.	n.a.	n.a.	2 (7.5)	n.a.
1975-1979 (ave)	4 (0.5)	2 (4.5)	10 (0.6)	10 (13.2)	n.n.	6 (16.4)	n.a.
1980-1984 (ave)	8 (0.7)	2 (6.9)	5 (0.2)	19 (19)	n.a.	10 (16.5)	8 (7.0)
1985-1989 (ave)	26 (2.2)	4 (15.8)	9 (0.3)	34 (33.8)	n.a.	19 (22.5)	8 (6.0)
1990-1994 (ave)	24 (1.6)	6 (19.3)	17 (0.4)	37 (28.1)	n.a.	21 (15.4)	12.2 (6.4)
1995-1999 (ave)	30 (1.5)	7 (15.2)	13 (0.3)	44 (19.6)	2 (0.6)	61 (37.7)	22 (8.3)
2000-2004 (ave)	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)	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)

[a] Figures in parentheses denote percentages to GDP.
Source: World Bank (2008, 2009a)

Table 2. Tonga: Selected key indicators

Land Area (Sq.km.'000)	0.72
Population (2006: '000)	104
Per Capita GDP (US$) Current Prices (2008)	2,548
Aid Per Capita in US$ (2007)	296
Aid as percentage of GDP (2007)	12.0
Annual Average Growth Rate in percent (2001-2008)	1.4
Annual Average Inflation in percent (2001-2008)	9.0
Overall Budget Balance as percent of GDP (2001-2007)	0.4
Current Account Balance as percent of GDP (2001-2007)	-6.6

Source: World Bank (2009b), UNESCAP (2007)

Table 3. Tonga: Financial System Structure

	Assets (Millions of pa'anga)	Per cent in Total Assets	Per cent of GDP	Number of Institutions
Commercial banks	200.4	81.6	72.3	3
State-owned development bank	45.1	18.4	16.3	1
Insurance companies	n.a.	n.a.	n.a.	6
Total	245.5	100.0	88.6	10

Source: National Reserve Bank of Tonga (2008)

With agriculture dominating the economy, and with no significant manufacturing activities, Tonga's exports base is very narrow. It includes off season squash exports to niche market in Japan, and bananas and vegetables to New Zealand. Agricultural exports make up two-thirds of total exports.

The financial sector (Table 3) consists of five institutions: a central bank, three commercial banks, and one state-owned development bank. Banking activities are largely confined to urban areas. In the absence of bond and equity markets, there are no attractive financial assets other than saving and time deposits in banks for savers to invest in.

Data, modelling, methodology and results

Our study focuses on linkages between expenditures out of remittances and GDP. We assume that after meeting consumption expenses, savings out of remittances contribute to farm investments, thereby enhancing exports of fruits and vegetables. In the context of paucity of disaggregated data, our study employs the aggregated data relating to variables (Table 4), which are reported on an annual basis by the World Bank (2008, 2009a, b).

Table 4. Tonga: Growth Rate, Remittances and Financial Indicators

Variables	GDP Growth Rate (%)	Remittances (% of GDP)	Exports (% of GDP)	Money & quasi money (% of GDP)	Private sector credit (% of GDP)
1981-1985 (average)	3.4	21.1	25.8	28.5	19.3
1986-1990 (average)	0.3	21.8	27.8	31.5	31.6
1991-1995 (average)	3.7	16.8	21.2	31.0	34.2
1996-2000 (average)	1.8	25.7	14.0	36.8	50.2
2001	3.1	39.0	11.0	45.6	53.9
2002	1.7	44.3	18.0	44.7	56.4
2003	3.1	32.6	19.0	44.5	56.8
2004	1.1	34.0	21.0	47.5	51.5
2005	-3.3	30.6	20.0	52.6	64.1
2006	4.4	30.5	16.0	52.0	59.2
2007	-0.3	39.4	16.6	53.8	65.1
2008	1.2	37.7	17.1	50.7	64.9

Source: authors' calculation from World Bank (2009a and 2009b)

There are two indicators of financial sector development. One reflects financial deepening, which is the ratio of M2 (broad money: currency and demand and time and savings deposits) to GDP. The other one is the ratio of bank credit to private sector to GDP. Among the two indicators of financial development, we choose

ratio of credit to private sector to GDP, which has been increasingly recognized as superior to the other.[2]

We, therefore, hypothesize that (i) credit to private sector is positively associated with growth in output; (ii) a rise in private sector investment, facilitated by increases in credit leads to a rise in production of goods and services; (iii) domestic market being small, rise in output results in increase in exports; and (iv) interaction between remittances and financial sector positively influences growth. The model is written as follows:

Equation (1):

$LRGDP = f (LREM, LCRE, LXGS, LREMCRE)$

Where:

$LRGDP$ = GDP in millions of local currency (paanga) in constant prices;

$LREM$ = remittances as per cent of GDP;

$LCRE$ = private credit as per cent of GDP;

$LXGS$ = exports of goods and services as per cent of GDP;

$LREMCRE$ = the interaction term between financial development and remittance

Since the number of observations is not large enough, we resort to bounds testing approach under the autoregressive distributed lag (ARDL) procedure developed by Pesaran *et al.* (2001).[3] For econometric analysis, all variables are duly transformed into their natural logs. An ARDL model of Equation 1 is constructed as follows[4]:

Equation (2):

$$\Delta LRGDP_t = \beta_0 + \beta_1 LRGDP_{t-1} + \beta_2 LREM_{t-1} + \beta_3 LCRE_{t-1} + \beta_4 LXGS_{t-1} +$$
$$\beta_5 LREMCRE_{t-1} + \sum_{i=1}^{p} \alpha_{1i} \Delta LRGDP_{t-i} + \sum_{i=0}^{p} \alpha_{2i} \Delta LREM_{t-i} +$$
$$\sum_{i=0}^{p} \alpha_{3i} \Delta LCRE_{t-i} + \sum_{i=0}^{p} \alpha_{4i} \Delta LXGS_{t-i} + \sum_{i=0}^{p} \alpha_{5i} \Delta LREMCRE_{t-i} + \varepsilon_t$$

In the estimation procedure we add trend variable to capture the influences of other relevant variables which are not included. 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 equating to zero.

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[2] In the event of a rise in statutory reserve ratio, banks are required to keep higher reserves with central bank. Since a mere rise in M2/GDP by itself would not be a sufficient indicator, credit to private sector is a more appropriate measure as it is directly related to the quantity of investment and hence to economic growth.

[3] Good expositions of the ARDL bounds testing are available in Narayan (2005) and Narayan and Smyth (2006).

[4] In the estimation procedure we add trend variable, which captures the influences of other relevant variables, which are omitted for the reason that relevant time series are not available on a consistent basis.

Hence, bounds test is based on the F-statistics (or Wald statistics) with the null hypothesis of no co-integration; $H_0 : \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$

against its alternative hypothesis of a long-run cointegration relationship:

$H_1 : \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0$

Bounds testing procedure does not require pre-testing the variables for unit roots. However, we conducted unit root tests, since Granger causality tests have to be done in the first differences. Unit root tests[5] reveal all variables are integrated of order one

The results of bound tests are reported in Table 5. The test results reject the null hypothesis of no long-run relationship between the variables. This is evident by the computed F-statistics, which is greater than the upper bound value in the equation with LRGDP as the dependent variable. However, the respective F-statistics in the equations with other variables as dependent variables are not significant. Thus, there is only one cointegrating equation, which is with LRGDP as dependent variable.

Table 5. Results of Bound Tests

Dependent Variable				Computed F-statistic			
LRGDP				19.603***			
LREM				2.551			
LCRE				2.140			
LXGS				1.444			
LREMCRE				0.710			
	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	4.134		5.761	
5 per cent	2.62		3.79	2.910		4.193	
10 per cent	2.26		3.35	2.407		3.517	

*[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.*

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The long-run estimated coefficient obtained by bounds testing procedure is shown as follows:

Equation (3):

$LRGDP_t = 2.710 + 0.356LREM * + 0.974LCRE * * + 0.130LXGS * * + 0.447LREMCRE * + 0.001TREND$
t = (2.334) (2.544) (4.380)   (5.349)   (2.862)   (0.256)

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

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[5] The unit root results would be made available on request.

All the explanatory variables have the theoretically expected positive signs and are significant. The results confirm that remittances, private credit and exports stimulate economic growth. As for the magnitudes of coefficients, we observe that private credit has the greatest effect on output as compared to other explanatory variables. Equally important to emphasize is the significance of the interaction term (LREMCRE).

Table 6. Granger Causality Test Results

Dependent Variable	F-statistics[a]					ECT (t-statistics)
	ΔLRGDP	ΔLREM	ΔLCRE	ΔLXGS	ΔLREMCRE	
ΔLRGDP	-	3.1059*	3.2278*	12.8742***	4.6045**	-0.1508* (-1.9301)
ΔLREM	1.6939	-	3.3508*	3.6522*	0.1041	-0.2221 (-0.5940)
ΔLCRE	3.3706	6.6953**	-	16.5397***	7.7779**	-0.0255 (-0.1287)
ΔLXGS	6.9915**	4.4551*	6.2026**	-	2.6930	-0.7271 (-1.6223)
ΔLREMCRE	0.6271	0.5451	1.0947	1.7033	-	-0.7030 (-0.8825)

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

Table 6 reports the results of long-run and short-run Granger causality tests. Among the four equations, error correction term (ECT) is statistically significant with the expected negative sign only in the equation with LRGDP, as dependent variable. The test results also confirm that there is only one cointegrating equation, namely the equation with LRGDP as dependent variable, which was obtained from bound tests. Aside from the long run unidirectional linkage running from remittances, credit, exports and interaction term to output, we find similar relationship in the short-run too.

Conclusions and policy implications

Examining the nexus between remittance and economic growth in Tonga during the past 28–year period (1981-2008), this study shows that remittance inflows along with the liquidity in the banking system led to increases in credits to private sector and hence greater economic activities resulting in more exports and growth in the GDP.

The policy implications are: (i) since financial sector development is key to growth, appropriate incentive measures are needed to encourage the remittance recipient families to deposit them in financial institutions; (ii) incentive measures should include higher interest rates for remittance deposits than for domestic currency deposits on the lines offered by the South Asian countries for attracting deposits from their non-resident nationals; and (iii) government in consultation with financial institutions should review the current structure of fees and other charges on inward remittances at both ends with a view to removing any hurdles that may constrain remittance flow through the formal channels.

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