

# IMF Working Paper

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## Determinants of Remittances: Evidence from Tonga

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**IMF Working Paper**

Asia and Pacific Department

**Determinants of Remittances: Evidence from Tonga**

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**Abstract**

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This paper analyzes the determinants of remittances to Tonga. The results indicate that macroeconomic conditions in remitting countries and exchange rate fluctuations influence remittances. In particular, remittances growth falls when the Tongan currency appreciates, but increases with higher real GDP growth and lower unemployment in remitting countries. The analysis also finds that the influence of these determinants varies with the recipients of remittances, with remittances to non-profit organizations being more sensitive to an appreciation of the Tongan currency and the interest rate differential between Tonga and remitting countries than remittances to households. However, the analysis does not find evidence of "Dutch Disease" in Tonga, as the real exchange rate does not appear to be affected by remittances.

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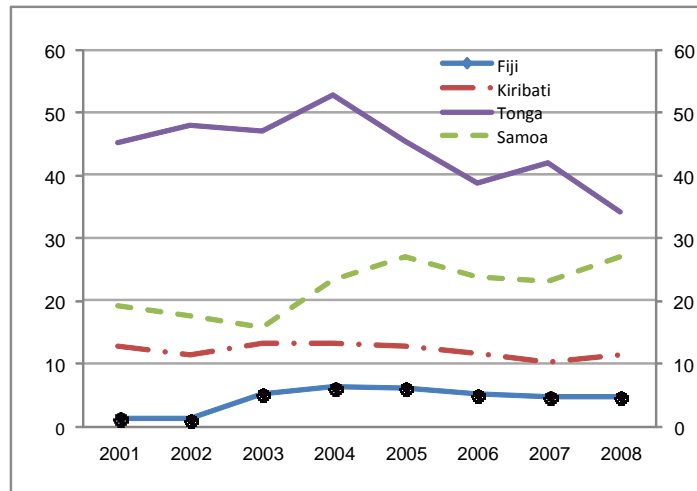
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## I. INTRODUCTION

Remittances are important to Tonga. Over the past decade, remittances as a share of GDP in Tonga have varied between 30 and 55 percent, with an average of around 45 percent, making Tonga the leading recipient of remittances relative to GDP among Pacific island countries (PICs) (Figure 1). Remittance flows to the Pacific region in the past decade primarily reflect the impact of increased migration due to low GDP growth and income levels in the destination countries.

Figure 1. Remittances as a Share of GDP (in percent)



Remittances are the main source of foreign exchange inflows in Tonga, accounting for over 67 percent of imports—more than in other PICs—while exports account for only 31 percent. Remittances appear to be a much more reliable source of foreign exchange than exports (the coefficient of variation for remittances growth is 13 compared to a coefficient of variation of 22 for exports growth) (Figure 2). The smaller volatility of remittances growth has usually been explained by the strong altruistic relationships that Tongans living abroad maintain with their family in Tonga, as in many other PICs. Remittances originate mainly from the United States, New Zealand, and Australia (Figure 3), where Tongans primarily work in the construction or agricultural sectors.

There are two major recipients of remittances in Tonga: households and nonprofit organizations (mostly churches). Remittances to households are primarily used for consumption rather than investment purposes, although in some cases, emigrants also help family members receive better healthcare and education. Remittances to churches, however, are mainly used for church construction and maintenance.

Figure 2. Remittances and Exports (growth in percent)

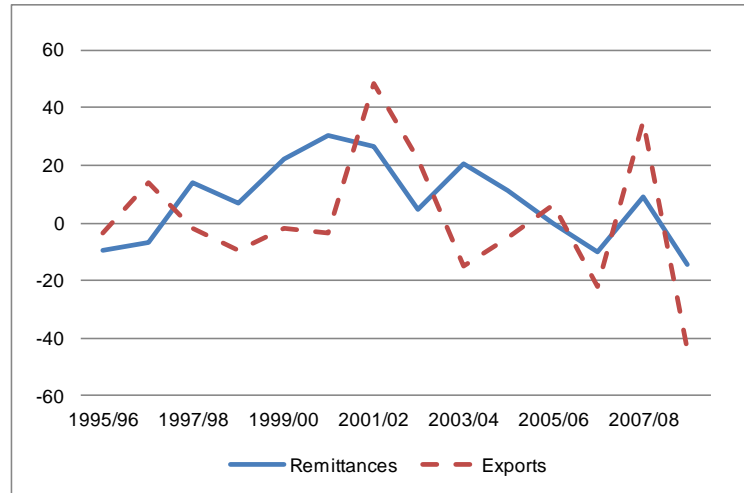
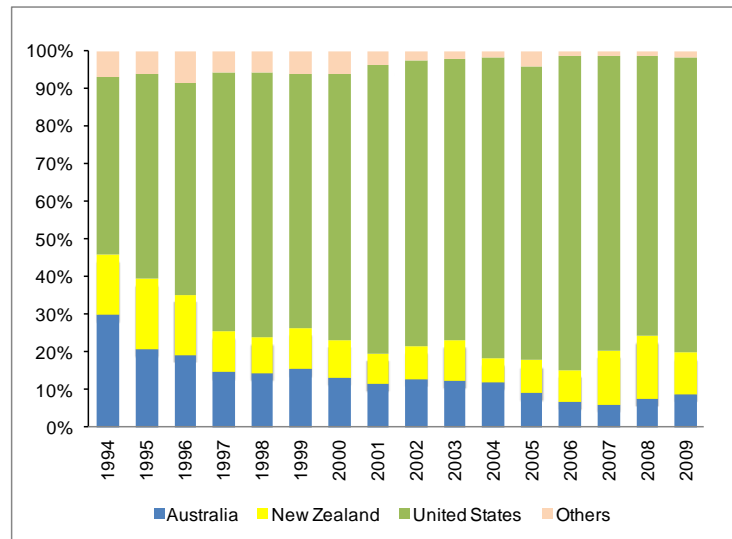


Figure 3. Share of Remittance Flows by Country of Origin



Against this background, this paper analyzes the determinants of remittances to Tonga and gauges whether remittance inflows have a significant impact on Tonga's real effective exchange rate. Macroeconomic conditions in remitting countries and exchange rate fluctuations are found to influence remittances. The paper utilizes a panel regression of the growth in remittances on changes in the real bilateral exchange rate, real GDP growth, and unemployment rate in remitting countries, and the interest rate differential between Tonga and remitting countries. The estimated parameters indicate that remittances growth falls with an appreciation of the Tongan currency, but increases with higher real GDP growth and lower unemployment rate in remitting countries. In addition, the estimated exchange rate impact indicates that Tongans abroad do not compensate for changes in exchange rates (and possible higher transaction costs).

The impact of these macroeconomic variables on remittances is found to vary with the recipients of those remittances, namely whether the recipients are households or nonprofit organizations. Remittances to nonprofit organizations are more sensitive to a real appreciation of the Tongan currency and the interest rate differential between Tonga and remitting countries than to real GDP growth or employment conditions in remitting countries.

With regard to the impact of remittances in exchange rates, the analysis does not find evidence of “Dutch Disease” in Tonga, as the real effective exchange rate does not respond significantly to the change in remittance flows. One possible reason for this is that remittances to Tonga are primarily used for consumption, most of which is imported with little impact on the demand for nontradable goods, and hence there is little pressure for the currency to appreciate in real terms.

The remainder of the paper is organized as follows. Section II reviews briefly the literature, Section III presents the empirical evidence, and Section IV concludes the paper.

## **II. LITERATURE REVIEW**

### **A. Determinants of Remittances**

The literature on the determinants of remittances generally finds altruistic and investment motives to remittances.<sup>2</sup> When guided by altruistic motives, remittances aim to support recipients in their daily expenditure and/or compensate them for catastrophic events. In this case, remittances are negatively correlated with economic conditions (real GDP growth and employment) in the home country. The end use of remittances is primarily consumption. When guided by investment motives, remittances aim to take advantage of high returns or other opportunities for profits in the home country. In this case, remittances are positively related to economic conditions and investment opportunities in the home country (as indicated by real GDP growth and real interest rate differential between the home country and the remitting country).

At the same time, remittances likely depend on expatriates’ income and bilateral exchange rates between the home and remitting country. As a proxy for income, real GDP growth and unemployment rates will be used. Real GDP growth is expected to be positively related with remittance growth and unemployment is expected to be negatively correlated with remittances growth. Changes in income of expatriates would affect the remittances through their own consumption smoothing needs. The impact of the exchange rate is less of a clear cut since expatriates could decide to send a fixed amount of money in the currency of the

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<sup>2</sup> See for example Johnson and Whitelaw (1974) and Lucas and Stark (1985).

country they live in (for example, US\$100 per month), or in the Tongan currency, compensating for the effects of exchange rate changes.

The variables mentioned above have been found to be important determinants of remittances in empirical studies. Chami, Fullenkamp, and Jahjah (2005) estimate a panel regression that relates the remittances-to-GDP ratio to the income and interest rate differentials between the home country and the United States. The results show that the income gap has a negative and significant effect on remittances, whereas the real interest rate differential has a positive but insignificant effect. Browne and Mineshima (2007) find that remittances to the Pacific region depend on the rate of real GDP growth in remitting countries, the distance to remitting countries, and whether the home and remitting country share a common language. Browne and Mineshima also find close links between remittances and the aggregate stock of migrants, the concentration of foreign trade with a small number of regional partners, and shared historical and social factors associated with past colonial relationships. Chamon, Semblat, and Morant (2005) find that remittances to Samoa are influenced by growth in remitting countries and in Samoa and changes in the exchange rate. A depreciation of the Samoan currency is associated with an increase in remittance flows in the Samoan currency. Growth in remitting countries has a strong positive and statistically significant effect on remittances to Samoa, while growth in Samoa has a negative and statistically significant effect on remittances.

### **B. Impact of Remittances on the Real Effective Exchange Rate**

Remittances can affect long-term growth through several channels, one of which is the exchange rate. Changes in the real effective exchange rate affect the distributional impact of remittance inflows, both by altering the returns to factors employed in the traded and nontraded goods sectors and by affecting the relative price of traded and nontraded consumption goods. The empirical evidence on the effect of remittances on exchange rates is, however, mixed.

Bourdet and Falck (2003) find that remittance inflows into Cape Verde during 1980–2000 were associated with an appreciation of the equilibrium real exchange rate. Hyder and Mahboob (2005), Saadi-Sedik and Petri (2006) find similar results for Pakistan and Jordan. Amuedo-Dorantes and Pozo (2004) also find that remittances inflows lead to an appreciation of the real exchange rate. Holzner (2006) finds similar results using a worldwide sample. However, Rajan and Subramanian (2005) find that remittance inflows are not associated with slower growth in manufacturing industries with higher labor intensity or greater export orientation, suggesting that remittance inflows do not result in “Dutch disease”.

### III. EMPIRICAL ANALYSIS

#### A. Data Description and Model Specification

The data for remittances in this paper cover remittances to Tonga for the period 1994Q1–2009Q1, from Australia, New Zealand, and the United States. The data set represent an improvement over many existing cross-country studies in three important dimensions. First, a common practice in the literature has been to sum the three components of the balance of payments when compiling statistics on remittances: workers' remittances, employee compensation, and migrants' transfer,<sup>3</sup> even though migrants' transfers and employee compensation statistics are not conceptually representative of remittance behavior (Chami, et al., 2008). The remittances series used in this paper are provided by the Tongan authorities and represent workers' remittances only. Second, the remittances are available by country of origin, which enables us to control for remitting country fixed effects. Third, the remittances are also available by types of recipients: households and nonprofit organizations (mostly churches). For households, remittances typically finance consumption, while nonprofit organizations such as churches usually use the remittances for church construction and maintenance. Failing to distinguish remittances by end use may significantly affect the estimates of the determinants of remittances.

Figure 4 plots the relationship between remittances growth and GDP growth in remitting countries (left panel) and that between remittances growth and changes in the real exchange rate against remitting countries (right panel). It shows, as expected, a positive correlation between remittances growth and GDP growth in remitting countries. Remittances growth seems negatively related to an appreciation of the Tongan currency. Figure 5 plots the relationship between remittances growth, GDP growth in Tonga, and the change in the real effective exchange rate. The figure shows a clear negative relationship between remittances growth and GDP growth in Tonga, and between remittances growth and changes in real effective exchange rate. Most of the relationships observed here will be tested in the regressions with other control variables.

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<sup>3</sup> See for example, *Global Economic Prospects* (World Bank, 2005), *the World Economic Outlook* (IMF, 2005), Aggarwal, Demirguc-Kunt, and Martinez Peria (2006), and Giuliano and Ruiz-Arranz (2005).



Figure 4. Remittances, Bilateral Real Exchange Rate, and Growth in Remitting Countries

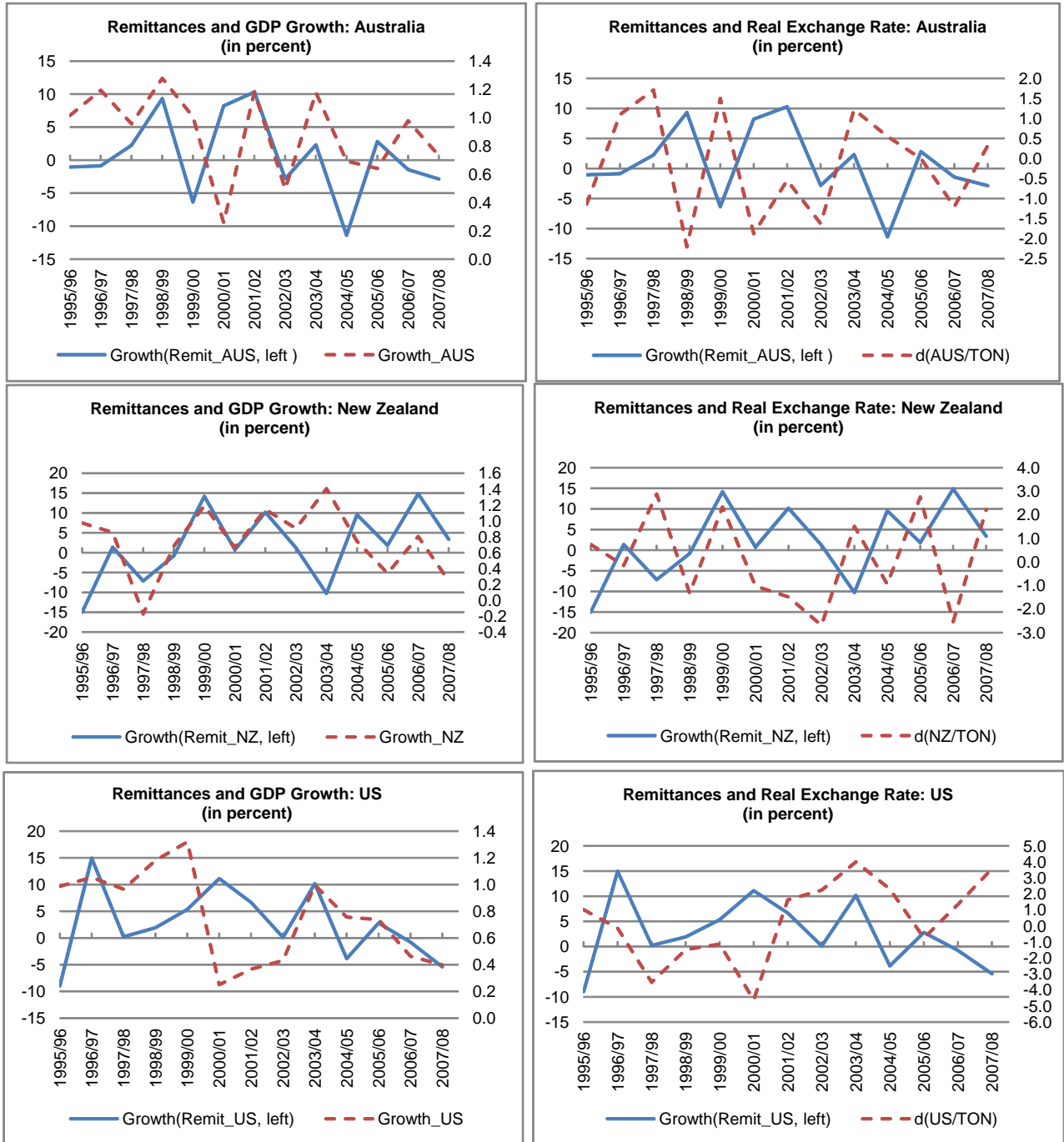
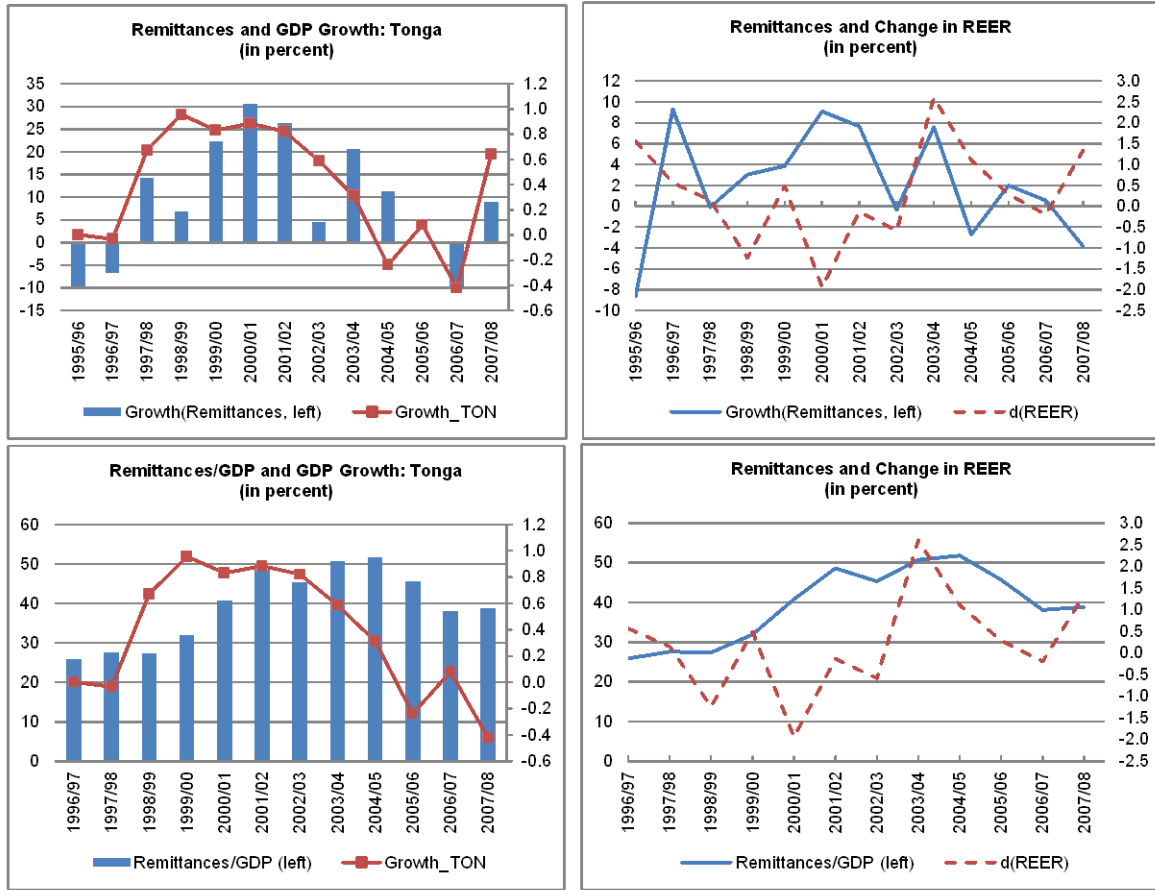


Figure 5. Remittances, Growth, and Real Effective Exchange Rate in Tonga



We first study the determinants of remittances from Australia, New Zealand, and the United States in a panel setting with a fixed-effect specification to control for unobserved time-invariant characteristics of remitting countries. We estimate the determinants of remittances using GMM in a dynamic panel data (with lagged dependent variable), using the following specification.

$$d \ln(\text{remittances})_{i,t} = \alpha_i + \beta_1 * d \ln(\text{remittances})_{i,t-1} + \beta_2 * \text{appreciation}_{i,t} + \beta_3 * \text{growth}_{i,t-1} + \beta_4 * \text{unemployment}_{i,t-1} + \beta_5 * (\text{interest}_{TON,t-1} - \text{interest}_{i,t-1}) + \varepsilon_{i,t} \quad (1)$$

The dependent variable is the growth of remittances from country  $i$  in quarter  $t$ .  $\text{appreciation}_{i,t}$  is the one-period change in the real exchange rate between country  $i$  and Tonga in quarter  $t$  (an increase in the value denotes an appreciation of the Tongan currency). To address the potential endogeneity concerns, we use as instruments the lagged real GDP growth of remitting countries, lagged unemployment rate in remitting countries, and lagged interest rate differentials between Tonga and remitting countries (see Table 1 for variable definitions and Table 2 for summary statistics).

Table 1. Definition and Source of the Variables

<b>Variable</b>	<b>Description</b>
Remittances	In T\$. Source: Tongan authorities.
Real exchange rate	Bilateral real exchange rate, foreign currency per Pa'anga. Source: <i>International Financial Statistics</i> , IMF.
Real effective exchange rate	Source: <i>International Financial Statistics</i> , IMF.
GDP growth	Growth of gross domestic product in local currency, constant price. Source: <i>World Economic Outlook</i> , IMF, October 2009.
Unemployment rate	Source: <i>World Economic Outlook</i> , IMF, October 2009.
Interest rate	Three-month treasury bills for Australia, New Zealand, and the United States. Three-month lending rates for Tonga. Sources: RBA Statistical Bulletin, RBNZ Interest Rates Table B2, Federal Reserve table H15, and <i>International Financial Statistics</i> , IMF.
Inflation rate	CPI inflation. Sources: Tongan authorities and <i>International Financial Statistics</i> , IMF.
Terms of trade	Exports price index/Imports price index. Source: Tongan authorities.
Trade openness	Exports and imports of goods and services divided by GDP in current price. Sources: Tongan authorities and <i>World Economic Outlook</i> , IMF, October 2009.
Financial openness	Foreign assets and foreign liabilities divided by GDP in current price. Sources: <i>International Financial Statistics</i> and <i>World Economic Outlook</i> , IMF, October 2009.
M2/GDP	M2 divided by GDP in current price. Sources: <i>International Financial Statistics</i> and <i>World Economic Outlook</i> , IMF, October 2009.

Table 2. Summary Statistics: 1994Q1–2009Q1

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
<b>Tonga</b>						
Growth in Total Remittances	60	0.02	0.03	0.20	-0.47	0.45
Growth in Total Remittances to Households	60	0.03	0.06	0.18	-0.40	0.38
Growth in Total Remittances to Non-profit Organizations	60	0.00	0.05	0.46	-1.58	0.83
Appreciation in REER	60	0.00	0.00	0.02	-0.07	0.05
3-month Interest Rate (in percent)	61	11.36	11.35	0.63	9.03	12.65
Inflation (in percent)	61	1.46	1.56	1.47	-2.58	4.51
Terms of Trade	60	92.69	81.47	39.97	38.66	172.86
Financial Openness	44	0.29	0.23	0.12	0.13	0.56
Trade Openness	61	0.80	0.79	0.13	0.58	1.20
M2/GDP	44	0.53	0.51	0.11	0.35	0.77
<b>Australia</b>						
Growth in Remittances to Tonga	60	0.00	-0.01	0.27	-0.74	0.60
Growth in Remittances to Households	60	0.01	0.04	0.26	-0.81	0.75
Growth in Remittances to Non-profit Organizations	60	-0.03	0.08	0.81	-2.28	1.96
Real appreciation of pa'anga againsts AUS\$	60	0.00	0.00	0.03	-0.08	0.19
GDP Growth (in percent)	61	0.86	0.84	0.59	-0.93	2.62
Unemployment Rate (in percent)	61	6.51	6.37	1.56	4.03	10.13
3-month Interest Rate (in percent)	61	5.78	5.61	1.07	3.20	8.19
Inflation (in percent)	61	0.68	0.67	0.60	-0.42	3.72
Financial Openness	61	6.93	7.11	1.55	4.59	10.24
Trade Openness	61	0.41	0.41	0.03	0.35	0.53
M2/GDP	46	2.85	2.89	0.17	2.51	3.13
<b>New Zealand</b>						
Growth in Remittances to Tonga	60	0.00	-0.01	0.28	-0.98	0.56
Growth in Remittances to Households	60	0.02	-0.01	0.27	-1.05	0.59
Growth in Remittances to Non-profit Organizations	60	-0.04	0.03	1.08	-3.97	3.37
Real appreciation of pa'anga againsts NZ\$	60	0.00	0.00	0.03	-0.07	0.10
GDP Growth (in percent)	61	0.72	0.86	0.79	-1.00	2.72
Unemployment Rate (in percent)	61	5.59	5.38	1.49	3.57	8.97
3-month Interest Rate (in percent)	61	6.88	6.78	1.61	3.67	9.96
Inflation (in percent)	61	0.57	0.57	0.50	-0.79	1.67
Financial Openness	61	7.24	7.68	1.37	4.85	9.91
Trade Openness	61	0.60	0.59	0.05	0.53	0.72
M2/GDP	46	1.43	1.44	0.12	1.15	1.68
<b>United States</b>						
Growth in Remittances to Tonga	60	0.02	0.05	0.23	-0.59	0.54
Growth in Remittances to Households	60	0.03	0.05	0.21	-0.52	0.46
Growth in Remittances to Non-profit Organizations	60	0.01	0.12	0.63	-1.08	1.64
Real appreciation of pa'anga againsts US\$	60	0.00	0.00	0.03	-0.09	0.09
GDP Growth (in percent)	61	0.66	0.73	0.66	-1.65	1.95
Unemployment Rate (in percent)	61	5.18	5.23	0.80	3.90	8.07
3-month Interest Rate (in percent)	61	4.26	4.91	1.73	0.93	6.44
Inflation (in percent)	61	0.62	0.62	0.67	-2.83	2.20
Financial Openness	60	1.63	1.41	0.62	0.86	3.01
Trade Openness	61	0.06	0.06	0.01	0.05	0.08
M2/GDP	61	0.51	0.51	0.03	0.47	0.60

We then study the effects of remittances on the real effective exchange rate by estimating the following standard model of exchange rate.

$$\begin{aligned} dREER_t = & \alpha + \beta_1 * dREER_{t-1} + \beta_2 * d \ln(\text{remittances})_t + \beta_3 * \text{TOT}_t \\ & + \beta_4 * \text{financial openness differential}_{t-1} + \beta_5 * \text{trade openness differential}_{t-1} \quad (2) \\ & + \beta_6 * \text{M2/GDP differential}_{t-1} + \varepsilon_t \end{aligned}$$

where the dependent variable is the one-period change in the real effective exchange rate in quarter  $t$  (an increase in the value of which denotes an appreciation of the Tongan currency). The right-hand-side variables include the terms of trade, financial openness, trade openness, and the M2/GDP differential between Tonga and remitting countries. Equation (2) helps to test whether stronger remittance inflows lead to a real appreciation in the effective exchange rate. Since the bilateral real exchange rate between remitting countries and Tonga could potentially affect growth in remittances and potentially cause endogeneity bias problems, we use as instruments the lagged growth in total remittances, the lagged real GDP growth rate and unemployment rate of remitting countries, and the lagged real interest rate differential between Tonga and remitting countries (the latter three are all weighted by average shares of total remittances over 1994Q1–2009Q1).

## B. Empirical Results

This section presents estimates of the parameters in equations (1) and (2). Table 3 reports estimates of equation (1). The results are broadly consistent with those of other empirical studies. The results show that the remittances growth falls with an appreciation of real bilateral exchange rate between the remitting country and Tonga. A 1-percentage-point real appreciation in the Tongan currency against remitting country's currency is associated with a 2-percentage-point decrease in remittances growth. It suggests that Tongans abroad do not compensate for changes in exchange rates (and possible higher transaction costs).

The results also indicate that remittances growth increases with remitting countries' real GDP growth and decreases with the unemployment rate in remitting countries.

- A 1-percentage-point increase in real GDP growth in remitting countries is associated with a 4-percentage-points increase in remittances growth. Real GDP growth captures the potential capacity of expatriates for sending money back to Tonga. Stronger growth in remitting countries can also be expected to boost the demand for migrant workers, further improving the prospects for remittances.
- A 1-percentage-point increase in the unemployment rate in remitting countries is associated with a 1-percentage-point decrease in remittances growth.

Remittances growth increases with the interest rate differentials between Tonga and remitting countries. A 1-percentage-point increase in the interest rate differential is associated with a 2-

Table 3. Regressions for Determinants of Remittance Flows 1/

Dependent Variable:	(1)	(2)	(3)
First-difference ln(remittances)	Total	Households	Non-profit Organizations
First-difference ln(remittances) (first lag)	-0.324*** (0.036)	-0.298*** (0.043)	-0.374*** (0.049)
One-period increase in real exchange rate (foreign currency per Pa'anga) 2/	-1.736*** (0.354)	-1.163*** (0.407)	-4.686*** (0.485)
Real GDP growth in remitting country (in percent) (first lag)	0.044*** (0.008)	0.036*** (0.01)	0.005 (0.024)
Unemployment rate in remitting country (in percent) (first lag)	-0.012*** (0.005)	-0.005 (0.01)	-0.002 (0.019)
Interest rate differential between Tonga and remitting country (in percent) (first lag)	0.021*** (0.003)	0.012*** (0.001)	0.064*** (0.009)
Remitting country dummies included	Yes	Yes	Yes
Number of observations	174	174	174
Hansen's J statistic p-value	0.6576	0.6156	0.7174

1/ \*, \*\*, \*\*\* denote P-value less than 0.1, 0.05, and 0.01, respectively. Standard Errors are shown in parenthesis.

2/ An increase in the real exchange rate denotes a real appreciation of Pa'anga.

percentage-point increase in remittances growth. This result could indicate that remittances help compensate for higher financing costs in Tonga (which effectively weakens the transmission mechanism of monetary policy) but could also indicate some sensitivity to investment opportunities documented in some other research (e.g., Almekinders, Maslova, and Abenoja (2009)).

Columns (2) and (3) show the regression results for remittances to households and to non-profit organizations. Compared to remittances to households, remittances to non-profit organizations are more sensitive to an appreciation of the Tongan currency and to the interest rate differential between Tonga and remitting countries.

- A 1-percentage-point appreciation of the Tongan currency leads to a 1-percentage-point decrease in the growth of remittances to households compared to a 5 percentage-point decline in the growth of remittances to non-profitable organizations.
- A 1-percentage-point increase in the interest rate differential implies a 1-percentage-point increase in the growth of remittances to households compared to a 6 percentage-point increase in the growth of remittances to nonprofit organizations.
- However, real GDP growth in remitting countries does not have a statistically significant impact on the growth of remittances to nonprofit organizations, while it has positive and statistically significant effect on the growth of remittances to households.
- The unemployment rate in remitting countries has not been found to have a significant impact on either the growth of remittances to households or that to nonprofit organizations, once real GDP growth is controlled for, in contrast to the result for total remittances.

Table 4 reports the estimates of equation (2). In the context of this specification, remittance flows are not found to have a significant impact on the change in real effective exchange rate. This is consistent with the fact that remittances to Tonga are primarily used to finance consumption goods, most of which are imported and hence would less likely affect the demand for nontradable goods relative to tradable goods. Therefore, the real effective exchange rate is less likely to be affected. The table also shows that the results are robust to different weights assigned to the three major remitting countries. Column (2) uses shares of remittances as weight, while columns (3) uses share of PPP GDP of remitting countries as weight. Differentiating remittances to households from those to nonprofit organizations yields similar results (not tabulated).

Table 4. Regressions for Economic Impacts of Remittance Flows 1/

Dependent variable:			
One-period increase in real effective exchange rate 2/	(1)	(2) 3/	(3) 3/
One-period increase in real effective exchange rate (first lag)	0.199 (0.136)	0.250 (0.204)	0.274 (0.175)
First-difference ln(total remittances)	-0.012 (0.036)	-0.019 (0.078)	-0.064 (0.067)
Change in terms of trade	0.008 (0.014)	0.019 (0.022)	0.019 (0.022)
Weighted M2/GDP differential between Tonga and remitting countries (first lag)		0.000 (0.15)	-0.092 (0.126)
Weighted financial openness differential between Tonga and remitting countries (first lag)		-0.002 (0.024)	-0.028 (0.032)
Weighted trade openness differential between Tonga and remitting countries (first lag)		0.076 (0.049)	0.050 (0.051)
Constant	0.002 (0.003)	-0.053 (0.104)	-0.086 (0.061)
Number of observations	58	34	34

1/ \*, \*\*, \*\*\* denote P-value less than 0.1, 0.05, and 0.01, respectively. Standard Errors are shown in parenthesis.

2/ An increase in the real effective exchange rate denotes a real appreciation of Pa'anga.

3/ Columns (2) uses share of remittances as weight; columns (3) uses share of PPP GDP of remitting countries as weight.

#### IV. CONCLUSION

This paper analyzes the determinants of remittances to Tonga and gauges whether remittance inflows have a significant impact on the Tongan real effective exchange rate. The results indicate that macroeconomic conditions in remitting countries and exchange rate fluctuations influence remittances. Remittances growth falls with an appreciating currency of Tonga, but increases with higher real GDP growth and lower unemployment rate in remitting countries.

With regard to the impact of remittances in exchange rates, the analysis does not find evidence of “Dutch Disease” in Tonga. The real effective exchange rate does not respond significantly to the change in remittance flows. One possible reason for this is that remittances to Tonga are primarily used for consumption, most of which is imported with little impact on the demand for nontradable goods, and hence not much pressure for the currency to appreciate.



## REFERENCES

- Aggarwal, Reena, Asli Demirguc-Kunt, and Maria Soledad Martinez Peria, 2006, Do Workers' Remittances Promote Financial Development? Policy Research Working Paper No. 3957 (Washington: World Bank).
- Almekinders, Geert, Svitlana Maslova, and Zeno Abenoja, 2009, Bangladesh-Selected Issues (SM/09/300), International Monetary Fund.
- Bourdet, Yves, and Hans Falck, 2003, Emigrants' Remittances and Dutch Disease in Cape Verde, Working Paper, No. 11 (Kristianstad, Sweden: Kristianstad University College).
- Browne, Christopher and Aiko Mineshima, 2007, Remittances in the Pacific Region, IMF Working Paper, WP/07/35 (Washington: International Monetary Fund).
- Chami, Ralph, Adolfo Barajas, Thomas Cosimano, Connel Fullenkamp, Michael Gapen, and Peter Montiel, 2008, Macroeconomic Consequences of Remittances, IMF Occasional Paper 259 (Washington: International Monetary Fund).
- Chamon, Marcos, Romuald Semblat, and Anne Morant, 2005, Samoa-Selected Issues and Statistical Appendix, SM/05/181 (Washington: International Monetary Fund).
- Giuliano, Paola, and Marta Ruiz-Arranz, 2005, Remittances, Financial Development, and Growth, IMF Working Paper 05/234 (Washington: International Monetary Fund).
- Holzner, Mario, 2006, Real Exchange Rate Distortion in Southeast Europe, *Global Development Network Southeast Europe*. (Vienna: Vienna Institute for International Economics). Available via the Internet:  
<http://www.wiiw.ac.at/balkan/files/HOLZNER.pdf>
- Hyder, Zulfiqar, and Adil Mahboob, 2005, Equilibrium Real Effective Exchange Rate and Exchange Rate Misalignment in Pakistan. (Islamabad: State Bank of Pakistan). Available via the Internet:  
[http://www.sbp.org.pk/research/conf/Session\\_IV\\_Zulfiqar\\_Adil.pdf](http://www.sbp.org.pk/research/conf/Session_IV_Zulfiqar_Adil.pdf)
- Johnson, G.E., and W.E. Whitelaw, 1974, Urban-Rural Income Transfers in Kenya: An Estimated-Remittances Function, *Economic Development and Cultural Change*, Vol. 22, pp. 473–79.
- Lucas, Robert E.B., and Oded Stark, 1985, Motivations to Remit: Evidence from Botswana, *Journal of Political Economy*, Vol. 93, pp. 901–18.

Rajan, Raghuram, and Arvind Subramanian, 2005, What Undermines Aid's Impact on Growth?, IMF Working Paper 05/126 and NBER Working Paper No. 11657 (Washington: International Monetary Fund) (Cambridge, Massachusetts: National Bureau of Economic Research).

Saadi-Sedik, Tahsin, and Martin Petri, 2006, To Smooth or Not to Smooth: The Impact of Grants and Remittances on the Equilibrium Real Exchange Rate in Jordan, IMF Working Paper 06/257 (Washington: International Monetary Fund).

International Monetary Fund, 2005, *World Economic Outlook, April 2005: Globalization and External Imbalances*, World Economic and Financial Surveys (Washington).

World Bank, 2005, *Global Economic Prospects 2006: Economic Implications of Remittances and Migration* (Washington).

World Bank, 2006, World Development Indicators, <http://devdata.worldbank.org/data-query/>