

Migration and remittances sustainability in the case of Tonga

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Keywords

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Abstract

This paper examines the migration patterns of Tongans in New Zealand (NZ) and the sustainability of remittances flows from New Zealand to Tonga. Based on a survey analysis of the Tongan communities in New Zealand we address if remittances decline with the migrant's duration of absence. The econometric analysis for the sample size of 309 households first examines whether NZ-Tongan households' remittance flows to Tonga has decline over time. As the literature notes the pattern of remittances follows an inverted U shape, the analysis tests this in the case of Tonga. The results indicate that as families reunite in the new homeland remittances to Tonga decline. This decline indicates that at early stages of the migrant it rises and falls with longer length of stay. The estimated time period at which remittances reach the maximum point after which it starts to decline is about 17 years.

1. Introduction

The stability of remittance flows has been a key factor in the wellbeing literature of the remittances-recipients households. The development impacts of remittances on the economy and society are affected through the ways remittances are used. Remittance in the Pacific is a crucial resource towards regeneration of the economy through economic growth and is an effective mechanism for increasing households' income. As remittances are mainly used for households' consumption purposes and for small-medium business development, hence its impact depends on the sustainability of this flow. The migrant households send remittances not just in monetary form but also includes in-kind remittances (i.e., food, clothes, jewellery, household items and other consumer goods) not recorded in the official statistics. The focus of this paper is to empirically examine the sustainability of remittances flows from New Zealand to Tonga that evaluates whether remittances decay over time.

The Pacific Islands have sizeable migration flows mainly to Australia, New Zealand, and the United States which include movement of the educated labour force and seasonal workers. The highest rate of tertiary educated emigrants in East Asia and the Pacific region were from the Pacific nations in 2000 (World Bank, 2011).¹ The Tongan community in New Zealand make up the second highest population amidst the migrant communities at 20.4% of total Pacific Peoples, for the census period 2001-2013. Remittances, as a private flow, have assisted in improving the socio-economic factors of the recipient households and in reducing poverty and inequality. For social protection and poverty reduction it has been argued that the sustainability of remittances is crucial. This depends on numerous factors of the sending households based on various household head characteristics and family ties. Remittances provide a vital source of income for economic and social development of the households (Asian Development Bank, 2005, Organisation for Economic Co-operation and Development, 2006).

¹ Eight of the top 10 Pacific migrant nations are Samoa - 75.4%, Tonga - 75.2%, Fiji - 62.2%, Marshall Islands - 39.4%, Federated States of Micronesia - 37.8%, Papua New Guinea - 28.5%, Palau - 26.1%, Kiribati - 23.1%.

The sustainability of remittances is crucial however it depends on several factors and the characteristics of remitting household, ability to send money and family ties (Fuka, 1985; Walker and Brown 1995; Simati and Gibson, 2001; Connell and Brown, 2004, Makina and Masenge 2013). With a large diaspora over time, remitting financial and non-financial assistance (i.e., food, clothing, electrical items, household items, and agriculture and farm machinery) has represented a crucial part of the communities where family linkages have been maintained. Thus, a significant impact of migration has been marked by a higher remittance flows to Tonga. The motivation of remittances reflects migrants' concern for the family members and derives satisfaction from the welfare of their relatives. A survey questionnaire of 309 households from Auckland, Hamilton, Palmerston North and Wellington is conducted in 2012-13 period to examine whether New Zealand remittances to Tonga has declined with the household's duration of absence.

While Tonga has a very high magnitude of remittance flows, its cultural and social ties may still be very strong in sending money to the families although the households' resettlement in New Zealand has been for a long period. Moreover, the influence of migrant remittance-household behaviour may change if the commitments are high and there is a greater integration in their host country. To access the time pattern of remittances and characteristics of sending households the paper presents evidence from Tongan migrants in New Zealand. The next section presents a brief review of remittances decay hypothesis, followed by model specifications and empirical results in the penultimate sections. The analysis tests for the inverted U-hypothesis of remittances in the case of Tonga. The step indicated the time period at which remittances reach the maximum point after which it starts to decline. Conclusions are noted in the final section.

2. A Brief Overview of Remittances Decay Literature

The motivations of remittances reflect pure altruism (migrant's concern for family members, thus migrant derives satisfaction from the welfare of his/her relatives); pure self-interest (for asset accumulation and investment in home areas); implicit family agreement (repayment of informal/implicit loan for investment in education, migration costs); and portfolio management decisions (savings not needed for personal or family consumption are invested in portfolio management choice). The remittance decay hypothesis first noted by Stark (1978) stipulates that the level of remittances sent by migrants will decline over time as migrants' commitment and attachment to their relatives and home country weakens. Martin (1993) and Martin and Taylor (1995) note that in the case of Europe the industrial revolution led to a significant migration patterns that subsided with the eventual increase in income. The convergence of economic growth in home countries leads to a downward trend in remittances flows that reflect an inverted U pattern. Based on the remittances decay hypothesis the length of stay outside the home country can influence the remittance behaviour.

The two theories of remittances, namely, altruism and loan repayment theories, point out some insights into the rationale of the remittance decay hypothesis (Poirine, 1995, 1997). He notes the theoretical aspects of remittances decay which has been discussed and empirically examined for the developing countries. The remittance decay hypothesis suggests that the amount of remittances sent by migrants to their countries of origin declines through time. Some studies also note that the passage of time does not significantly influence migrant remittance behaviour and that remittances are maintained at high levels over long periods (see Hunte, 2004). If remittances do not decline, as suggested by remittance theory, the remittances decay hypothesis provides some indications of why remittances continue through time. The migration flows

Rather than querying what motivates a migrant to remit, the remittances decay hypothesis therefore focuses on the factors that influence continued existence of migrant/non-migrant relationships in which remittances are sent. Consequently, whether to increase, continue or decline in remittance flows indicate the process of household reconstitution abroad (Makina and Masenge 2013). Family reunification is the underlying social process that determines household remittance behaviour. Remittances are not simply sent but also exchanged for resources accessible through the maintenance of relationships with family members, which is linked to weakening of the altruism. Also, as families reunite in the new homeland, less money is sent back to the country of origin (Fuka, 1985, Vete, 1995). Also, the participation by households in migrant networks positively influences remittance behaviour (see Makina and Masenge, 2013 for a detail discussion).

A key outcome of remittances decay hypothesis is the length of stay a migrant has lived outside of the home country that can influence remittance behaviour. From the host country's perspective Brown (1997) notes the extent to which remittances decline based on the migrant's duration of absence and from the source country's perspective, the extent to which remittances are potentially responsive to variables other than the needs of dependents in the source country. Other factors have been noted such as a time effect, composition effect and size effect that impacts on the level of remittance flows to home countries (Brown, 1998). A key factor that also may reduce the level of remittances can be due to a higher number of dependents in the household (Connell and Brown, 2004).

Several case studies have been noted in the case of Pacific Island on the remittance decay hypothesis. Tongamo (1987) notes that amongst the Tongans in Sydney remittances level increased during the first few years of migration, up to around seven years, but then began to decline, although the migrants who had been in Australia for more than 18 years still sent remittances. While some studies provide support to this finding others do not indicate that remittances decay over time. Forsyth (1992) notes that in the South Pacific remittances decay due to longer the duration of migrants' stay abroad and the number of dependents at home. Remittances form an important source of income to improve wellbeing in the Tonga (Ahlburg, 1991, James, 1991, Marcus, 1993). Vete (1995) using a qualitative analysis shows aspects of the Auckland Tongan community's patterns of remittances flow in 1984 and their remittances behaviour. It is noted that the commitment of remitting money declined due to the number of dependents in New Zealand.

The remittance functions for Pacific island migrants have been empirically investigated by Brown (1997). For country-specific analysis of Tonga and Western Samoa migrants in Australia (Brown, 1998), remittances from the nurses' households did not decline significantly over time than what has generally been predicted. However, in taking other migrant households in the sample indicate that remittances showed a sharp decline after 15 years absence. The migrants' are motivated by factors other than altruistic family support, including asset accumulation and investment in home countries. The analysis by Makina and Masenge (2014) provide evidence of remittance decay hypothesis and the inverted-U pattern of remittances from migrants in South Africa. Gounder and Prakash (2009) in the case Fiji note that remittances in the Pacific have increased given the higher level of migration to Australia and New Zealand.

The study by Loomis (1990) found little evidence of remittance decay in the case of Cook Islanders in New Zealand. Another study that evaluates migrants' remittances from New Zealand to Tuvalu shows no support for the hypothesis that remittances decrease with the length of time that migrants spend in the host country (Simati and Gibson, 2001). Since a number of studies discuss on the sustainability debate of remittances that focus on the first generation

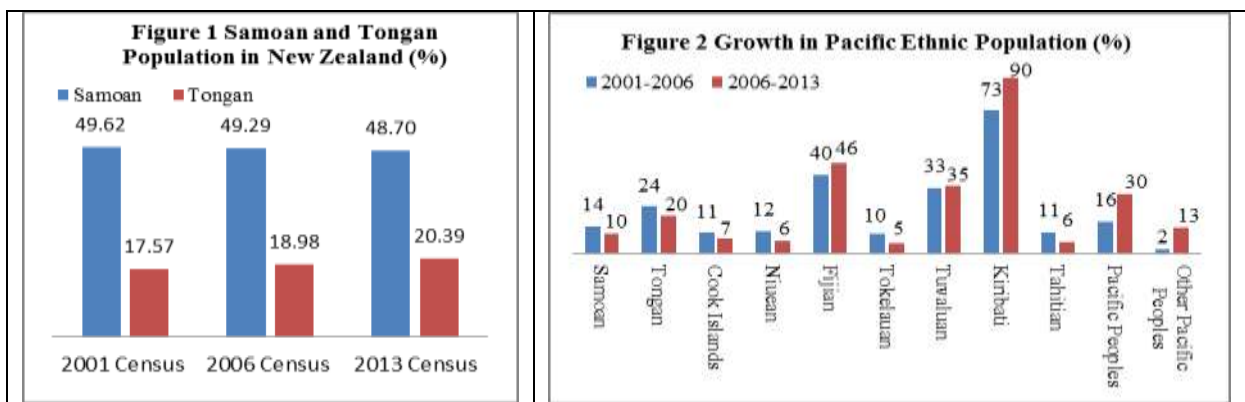
migrants however there is lack of empirical analysis and further analysis on the remittance habits and possible impact and behaviour of subsequent generations (see also Maclellan and Mares (2006) on a discussion of specific motives and remittances sustainability). This empirical study fills the gap of empirical evaluation to test the remittances decay hypothesis from NZ-Tongan community's pattern of remittances.

3. New Zealand Tonga Migration and Remittances

The Pacific Islands have a sizeable migration flow to Australia, New Zealand, Canada, the United States, United Kingdom and other Pacific nations. More recently, remittances form a substantial flow through the temporary labour schemes, i.e., Australia's Seasonal Worker Scheme and New Zealand's Recognised Seasonal Employer scheme. Besides permanent migration, the Pacific islands have large off-shore labour markets through specific employment abroad (for example, teachers, nurses, care takers, sports personnel and security officers). Remittances have become a vital source of income to the households that increase per capita income of the recipient households and play an important role in improving the standard of living.

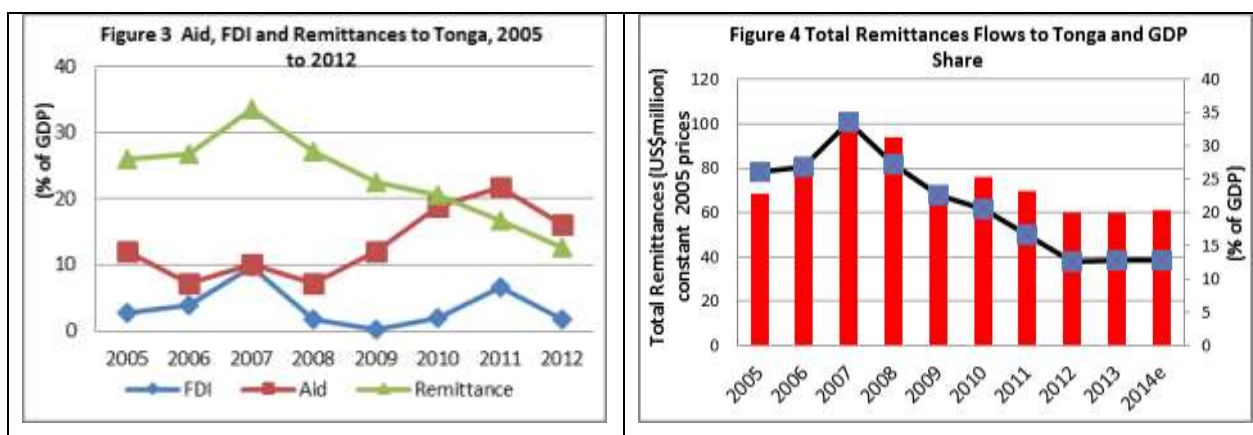
The Samoan and Tongan communities in New Zealand make up the highest and second highest population amidst the migrant communities at 48.7 percent and 20.4 percent of total Pacific Peoples, respectively, for the census period 2001-2013 (Figure 1). The growth in New Zealand's Pacific ethnic population over this period is shown in Figure 2. With a large diaspora over time, remitting financial and non-financial assistance has represented a crucial part of the communities where family linkages have been maintained. Thus, a significant impact of migration has been marked by a substantial increase in remittance flows to the Pacific Island Countries (PICs). The motivation of remittances reflects migrants' concern for the family members and derives satisfaction from the welfare of their relatives.

Remittances are larger primarily due to a greater number of educated migrants, higher income levels in Australia, New Zealand and the United States and also an increase in the number of temporary workers. The two largest remittance recipients amongst the Pacific island nations as a share of GDP are Samoa and Tonga, while Fiji receives the highest level in total monetary value. Comparing remittances to the other two main capital flows of foreign aid and foreign direct investment (FDI) it is seen that in Tonga foreign aid increased since 2008 and in 2010 has surpassed the remittances to GDP share. Although the level of aid declined in 2012 (16.12 percent), it is higher than the 2012 remittances level to GDP ratio (12.7 percent). The FDI level although increased to almost 10 percent of GDP in 2007, however it has not reached that level since then, amounting to about 2 percent in 2012.



Source: Statistics New Zealand, www.stats.govt.nz.

Tonga was the largest remittances recipient in terms of GDP share reaching 35 percent in 2007; since 2007 it has declined significantly to 12.8 percent of GDP in 2014 (Figures 4). Tonga's remittances to GDP share peaked at almost 35 percent in 2007, it declined to 12.8 percent in 2014 (Figure 4). In terms of GDP share Tonga is amongst the top 10 recipients of remittances in East Asia and the Pacific region (World Bank, 2014). With declining GDP share of remittances to Tonga, this flow has not registered a recovery, rising only by 0.2 percent in 2013 (12.9 percent) from the previous year to a decline of 0.1 percent (12.8 percent) estimated in 2014. In an uncertain economic recovery climate, high unemployment rates and the possible restrictions in immigration in destination countries could restrain the growth of remittances to Tonga. Although remittances level in Tonga declined since 2008 it still remained as the second highest recipient as a share of GDP in the Pacific. The level of remittances to GDP ratio suggests that it is not of little development relevance, particularly for the households, community and also national level macroeconomic development. The empirical analysis for the remittances decay hypothesis is presented next.



Source: World Bank (2015).

4. Empirical Estimation: Model Specifications and Methodology

For social protection and poverty reduction it has been argued that the sustainability of remittances is crucial. This depends on numerous factors of the sending households based on various household head characteristics and family ties. The decision to remit is based on two stages, i.e., whether to remit and conditional upon that decision how much to remit will occur simultaneously. Using Tobit analysis on both remitting and non-remitting migrants it is noted that this methodology provides consistent parameter estimates (see Brown, 1997, and Makina and Massage, 2013).²

Estimating the remittances decay hypothesis various studies utilise Tobit model to examine the remitting behaviour of households and of non-remitters. In the case if remittances decline over time the next step is to estimate the time period at which the remittances reach the maximum point and after which it starts to decline. The variables indicate the demand side and supply side characteristics of the households. The specification to tests for the inverted U-hypothesis of remittances in Tonga's case takes the following form:

$$R_i = \alpha t_i + \beta t_i^2 + X_i \gamma + \mu_i \quad (1)$$

²Tobin (1958) applied this methodology to analyse the household expenditure on durable goods where these expenditure include zero. The maximum likelihood method is applied that takes into two parts of remittance decision determinants.

Fitting the data to estimate the time length in equation (1) at which remittances reach the maximum point after which it starts to decline is based on the first order derivative of $f(x)=0$, where $f(x) = R$ with $R_i = \max(0, R_i)$. To solve for time length t , the equation is as follows:

$$\frac{df(x)}{dt} = \alpha t + \beta t^2 + X\gamma + \mu = \alpha + 2t \quad (2)$$

The maximum point is estimated solving equation (2) as

$$\alpha + 2t = 0 \quad (3)$$

where R_i is the amount of remittances in NZ\$ by i^{th} individual, as well as non-remitters, which indicate discrete and continuous distribution, i.e., $R_i = \max(0, R_i)$; t_i is the period of living in New Zealand; t_i^2 is the squared term for time spent in living in New Zealand to capture the non-linear pattern of remittance-sending households; α , β , γ are the estimated coefficients; X_i is the demand-side and supply-side characteristics of i^{th} individual; and also the socio-economic characteristic of the i^{th} individual; μ is the error term.

Data and Methodology

A number of studies note the use for demand-side and supply -side variables that indicate the remittances-motivational and that time factors reflect if there exist a reduction in remittances sent to home country given the length of absence (see Brown, 1997, Simati and Gibson, 2001; Makina and Masenge, 2014). The literature on remittances decay hypothesis notes various social and economic factors that highlight meeting the household commitments as well as the commitments of the families in the home countries. Following Brown, 1997, Simati and Gibson, 2001, Makina and Masenge, 2014, the variables utilised in the analysis are stated from the demand-side, supply-side and the behavioural factors as follows:

- The demand-side variables included are if household head's and spouse still have at least one living parent in home country (Parent); if household head is married with spouse still in the home country (Spouse) and if household head had visitors to stay in the preceding 12 months (Visitor).
- The supply-side variables are household income level (Income); value of assets held by the household in New Zealand less the value of debts (Assets); the number of persons living in the household (Size).
- The behavioural variables are the age of the household head (Age); if head of household expects to inherit assets from a parent still living in his or her country of origin (Inherit); if household head intend to return to his/her country of origin (Intent); Household head's business investment (Invest). The household head's level of education attainment before migration (Education). Access to bank services indicates if the migrant sends a larger amount of remittances through the formal channels to Tonga rather than informal channels. Tongan communities support various charitable/religious organisations in the home country is shown (Charity).
- Length of absence is taken to examine its impact on remittance based on the number of years since the migrant emigrated (Time). To measure the remittance decay the quadratic time value (Time²) tests for nonlinearity remittances decay function.

The methodology involved conducting survey in Auckland, Hamilton, Palmerston North and Wellington with the assistance of church congregations and other community-based organizations in these locations. Snowballing approach was initiated leading to various referrals. The study was conducted over the two year period due to unforeseen factors and delays. A total of 309 Tongan-New Zealander households were surveyed with established key informant method with the migrant community members for interviews. Remittance is also sent in non-monetary forms, such as clothing, food, electrical goods and farming equipment to families. The

list of variables and descriptive statistics for the variables are presented in the Appendix Tables 1 and 2.

Empirical Results

The Tobit results for the remittance decay hypothesis presented (Table 1) includes Tongan households that remit (i.e., 246 uncensored remittance sending households) and non-remitters (63 censored non-remittance sending households) for 309 observations. The estimated model diagnostic likelihood ratio (LR) test indicates no concerns. The coefficient for the Length of stay is positive and significant to the level of remittances while the estimated squared term for the length_stay²coefficient is negative and significant. These findings for the length of stay and the longer stay period support the remittance decay hypothesis that remittances increase in the early stages of migration and then declines after longer period of stay. This reflects the inverted U-pattern.

The computed result in the next step indicates the period when remittances reach the maximum point and after which it starts to decline. The estimated time length at which remittances reach the maximum point is about 17 years after which it starts to decline (based on the first order derivative) show at: $a+2t=0$, the estimated period for the inverted U hypothesis. Thus, remittances rise to a period of around 17 years after which Tongan-migrant remittances tend to fall. The results for decline in remittances are also noted by Brown (1998) in the case of Australia's Samoan and Tongan remitters. In the case of remittances from New Zealand-Tuvaluans, Simati and Gibson (2001) find no evidence of delaying remittance hypothesis, which is that remittances do not decrease with the length of time that Tuvaluan migrants spent in New Zealand.

The demand-side variables estimated here reflect if the level of remittances to support families in the home country. Remittances of the migrant households increase to support their Parents and also the Spouse living in Tonga. The findings provide significant relationship between migrant remittances and the surviving parent and spouse in home country. These positive coefficients suggest that migrants do not lower remittances to support the parent and assist the spouse living in Tonga.³The positive relationship is not seen to support the surviving In-law in home country. The Visitor coefficient is positive for the number of visitors from Tonga to the remitters' households in New Zealand. The estimated positive coefficient, though not significant, suggests some strength of the ties between households in New Zealand and Tonga.

Table 1 Determinants of Remittances for New Zealand-Tongan Migrants

Dependent variable = annual amount of NZ\$ sent by Tongan migrants		
Explanatory variable	Coefficient	t-statistic
length_stay	223.204	2.02**
length_stay ²	-6.656	-2.57***
Parent	1623.507	2.19**
In-law	-1620.112	-2.09**
Spouse	2075.284	1.64*
Visitor	771.421	1.08
Age	117.751	0.75
Age ²	-0.928	-0.60
Gender	1272.488	1.44
Education	-3005.83	-1.82**

³ The positive migrant remittance behaviour of New Zealand-Tuvaluan remitters supporting the parent is also noted by Simati and Gibson (2001).

Dependents in NZ	-236.444	-1.40
Income	0.0202	3.48***
Intent to return	-153.830	-0.23
Access to bank services	3363.86	3.73***
Investment (assets)	553.408	0.76
Inherit	133.201	0.20
Charity	1772.535	2.18**
Constant	-5427.407	-1.46
Observations	309	
Left-censored observations	63	
Uncensored observations	246	
LR $\chi^2_{(17)}$	90.89	
Log likelihood	-2491.7468	

Note: *, ** and *** at 10%, 5% and 1% level, respectively.

The supply-side result for income coefficient is positive and significant indicating that remittances to Tonga increase with the level of income. The estimated magnitude of income coefficient of 0.02 shows the marginal propensity to remit by around 2 percent, thus rise in income will tend to raise remittances. This finding is similar to the results shown by Brown (1997, 1998) and Simati and Gibson (2001) for Australia's remittances to Samoa and Tonga and New Zealand to Tuvalu, respectively. Asset accumulation does not significantly increase remittance to Tonga, the accumulation of assets do not affect remitter's behaviour. The negative Dependent coefficient show that remittances decline with the number of dependents in the household though the estimated coefficient is not significant. Thus, the number dependants in migrants' household in the host country do not affect the flow of remittances to Tonga. The findings of supply-side factors affecting the remittance decision suggest that remittances are not responsive to any cyclical fluctuations in household income from the economic conditions of New Zealand-Tongan migrants.

From the behavioural side of household head remitting to country of origin factors Age of the younger household head shows a positive relationship in sending remittances, however for the older households (Age^2) flow of remittances decline although it is not significant. Female household heads also tend to remit more than males. The estimated significant negative Education variable supports the view that education level does not influence the level of remittances. This result does not support Poirine's (1997) hypothesis that remittances are to compensate family loans in the home country for migrant's education. The migrant's Intent to return to Tonga does not increase remittances. Access to bank services indicates the migrant sends a larger amount of remittances through the formal channels to Tonga rather than informal channels. The positive Inherit variable indicates that the migrant is motivated by inheritance and continues to remit to the household members, but it is not significant. The estimated Charity positive and significant coefficient suggest that Tongan communities support various charitable/religious organisations in the home country is shown.

Conclusion

The empirical analysis is based on the survey of New Zealand-Tongans residing in Auckland, Hamilton, Palmerston North and Wellington, to estimate the remittances decay hypothesis. The findings in the case of Tonga provide evidence of remittances decay hypothesis and the inverted-U time pattern in the flow of remittances from Tongan migrant households in New Zealand. The study also further estimates the time length at which the remittances level decay

which has not been shown for the Pacific island nations in the previous studies. The findings lend support that remittances first increase with the time spent in the host country and later decline after 17 years. The decline in remittance after 17 years suggest the sustenance for family wellbeing does exists.

The findings also support the view from the demand-side factors that remittances flow from New Zealand to Tonga are based on altruistic motivation driven by the need to support the parent, spouse and visitors. The behavioural factors that reduce remittances are number of dependents, educational level does not affect remittances to compensate family loans in the home country and high income increases the level of remittances. The positive Age variable coupled with a negative Age square coefficient postulates the the inverted U behaviour in the relationship with the level of remittances. Access to bank shows the utilization of formal channels to remit and remittances support charity and religious organisations in Tonga. The findings in the case of New Zealand-Tongans remittance flows over time indicate the remittances decay where the decline in remittance is seen after 17 years which is a long period. Hence, there is some support for the altruistic motivation to assist the family in the home country.

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Appendix Table A1 List of Variables, Tongan Migrants in New Zealand

Variables	Descriptions
<i>Dependent variable</i>	Annual amount of NZ\$ sent by Tongan migrant
<i>Explanatory variable</i>	
Length of Stay in NZ	Number of years
Parent	Household head's parent (at least 1) in Tonga (Yes = 1, No = 1)
In-laws	Household head's in-laws (at least 1) in Tonga (Yes = 1, No = 1)
Spouse	Household head's spouse in Tonga (Yes = 1, No = 1)
Visitor	Household houseguests from overseas in the preceding 12 months(Yes=1, No=1)
Age	Household head age
Age_sq	Household head age squared
Gender	Male = 1, Female = 0
Education	1 = no school, 0 = others
Dependents in NZ	Number of dependents in NZ
Income	Total annual household head's income
Intent to return	Return to Tonga (Yes =1, staying in the NZ = 0)
Access to bank services	Send remittances through banks in NZ (Yes = 1, No =0)
Investment	Have portfolio investment in NZ (Yes = 1, No = 0)
Inherit	Household head expects inheritances (Yes = 1, No = 0)
Charity	Household head donates to Tonga-related development charity (Yes = 1, No = 1)

Appendix Table A2 Descriptive Statistics of Tongan Migrants in New Zealand

Variable	Mean	Std. Dev.	Min	Max
Remittances (annual)	3295	4971	0	48000
Length of stay (years)	18.95	11.25	0	54
Parent	0.706	0.457	0	1
Inlaw	0.754	0.431	0	1
Spouse	0.074	0.263	0	1
Visitor	0.398	0.490	0	1
Gender	0.828	0.378	0	1
Age	49	14	20	89
Education	0.065	0.246	0	1
Dependents in the host country	4.142	1.997	1	10
Income (annual)	59920	62224	0	52000
Intent to return	0.518	0.500	0	1
Access to banking services	0.129	0.336	0	1
Investment in the host country	0.282	0.450	0	1
Inherit	0.657	0.475	0	1
NGOs	0.731	0.444	0	1