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Remittances from Tongan migrant workers: Channels, costs, and potential gains from switching

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ADBI Working Paper Series

REMITTANCES FROM TONGAN MIGRANT WORKERS: CHANNELS, COSTS, AND POTENTIAL GAINS FROM SWITCHING

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Abstract

The background of high remittance costs and countermeasures against the issue has drawn the attention of policymakers in the Pacific island countries in maximizing the benefits of migration and remittances on their economic development. We use a newly collected household survey about temporary migration in the region and implement a data audit on remittance costs to examine the current state of the remittance market and household decision-making around remittance channels in Tonga. We find that the household choice of remittance channels leads to a higher remittance cost because a large gap in remittance costs exists between high-cost and low-cost remittance service providers. Tongan workers choose high-cost providers mainly because of their ease of use. Within this context, Tongan households and the economy can gain more than 2% of remittances by switching to the lowest-cost providers. We also find that exposure to new information thanks to migration experiences, frequent remittances, and residential islands are the key household characteristics to voluntarily shift from cash transfers to online transfers or mobile money. The findings indicate that micro-level intervention on the household choice of remittance channels and providers can potentially contribute to reducing remittance costs in the region, but we first need to identify the barrier to switching to low-cost providers to design effective policy interventions.

Keywords: remittance costs, migration, Tonga

JEL Classification: F24, O15

Contents

1.	INTRODUCTION.....	1
2.	BACKGROUND.....	3
2.1	Why is Reducing Remittance Costs Important for Developing Countries and the PICs?.....	3
2.2	Remittance Market in Tonga	5
3.	DATA.....	5
4.	RESULTS.....	9
4.1	The Choice of RSPs Increases Remittance Costs.....	9
4.2	Household Characteristics and the Choice of Remittance Channels.....	13
4.3	Simulation: How Much Would Be the Gain Made by Switching RSPs?	19
5.	DISCUSSION	21
6.	CONCLUSION	22
	REFERENCES	24
	APPENDIXES	
1	Issues in the PLMS Data Set	28
2	Supplemental Figures and Tables.....	32

1. INTRODUCTION

Remittances play a crucial role in the economic development of the low- and middle-income countries including the Pacific island countries (PICs). Remittance inflows to low- and middle-income countries recorded \$605 billion in 2021, uplifting the livelihoods of people through various channels, such as poverty reduction, the improvement of food security, and human capital investment (World Bank 2023c). However, high remittance costs remain a barrier. According to the Remittance Prices Worldwide, international migrants pay, on average, 6.25% of costs when they send \$200 to their home countries (World Bank 2023b). The situation is even worse in the PICs, with the average remittance costs in the region reaching 8 to 10% (World Bank 2023a; Raithatha et al. 2021: 19). Yet, there is not much knowledge about the background of the high remittance costs in spite of a strong interest from policymakers in the region (PACER Plus 2023; NRBT 2017: 26). In this context, this paper attempts to unpack the current state of remittance market and the household behavior around the choice of remittance channels in Tonga.

We choose Tonga as a case country because of the significance of remittances in the economy, the maturity of the remittance market, and a gap between policy interests and existing evidence. Tonga recorded the highest remittances-to-GDP ratio in the PICs at 43.9% in 2021 (Doan et al. 2023). Existing evidence shows that international remittances contribute to improving household welfare through poverty alleviation, wealth creation, increased household income and consumption, and improving subjective well-being (Gibson and McKenzie 2014; World Bank 2017b; Brown, Connell, and Jimenez-Soto 2014).

The remittance market in Tonga is mature, consisting of low-and high-cost remittance service providers (RSPs) including commercial banks, international and localized money transfer operators (MTOs), and mobile money.¹ The data from Remittance Prices Worldwide indicates that the choice of RSPs plays a crucial role in determining remittance costs in the country. The average remittance cost is higher than 8% in the Australia– and New Zealand–Tonga corridors, but there are remittance channels that cost less than 5%.

Tongan policymakers are already keenly aware of high remittance costs in the country. The National Reserve Bank of Tonga expresses the need for a deeper understanding of why Western Union remains in a dominant position even though the remittance cost is higher than other services such as mobile money (NRBT 2017: 26). The Ministry of Finance shows an interest in measuring high remittance costs and identifying how they can reduce remittance costs (PACER Plus 2023: 24). However, there has been little research that has delved into the background of the high remittance cost in Tonga to aid effective policy reforms. Thus, it is important to provide empirical evidence on high remittance costs in Tonga to meet such strong needs from policymakers.

We use two types of remittance cost data. First, we use the Pacific Labor Mobility Survey (PLMS) initiated by the World Bank and the Australian National University. The second type of data is audit data that we manually collected from Send Money Pacific and Saver Pacific. These are platforms that compare remittance costs by different RSPs and transfer methods, providing a wide range of information, including fixed fees, exchange rate margins, total cost in percentage, and the speed of transfers.

¹ Money transfer operators (MTOs) are the operators such as Western Union and Moneygram but do not include commercial banks and mobile money. When we include either commercial banks or mobile money, we call them remittance service providers (RSPs).

The main results are fourfold. First, the audit data show that there are large differences in remittance costs between high-cost and low-cost RSPs. Ria provides the lowest-cost services at an average cost of 1.76% in the Australia–Tonga corridor, and Ave Pa’anga Pau provides the lowest-cost services at an average cost of 3.33% in the New Zealand–Tonga corridor. These figures are more than 20 percentage points lower than the highest-cost RSPs in the two corridors.

Second, Tongan workers and households bear a higher cost of remittance by mainly using Western Union and Moneygram. Audit data show that these channels do not have cost advantage except the online transfers through Moneygram in the Australia–Tonga corridor. The PLMS reveals that ease of use is the most important factor in choosing RSPs and the users of the two popular RSPs are not cost-sensitive compared to the users of low-cost RSPs.

Third, the estimated results of multinomial logit regression suggest three key factors to voluntarily shift remittance channels from cash to online transfers. A higher chance of obtaining information about remittance costs promotes the usage of online transfers because the participation in temporary migration programs and living experiences in Australia and New Zealand are associated with a higher uptake of online transfers through banks or MTOs and a lower uptake of cash transfers through MTOs. Frequent remittances also have a negative association with the use of cash transfers through MTOs while having a positive association with the use of online transfers through MTOs. Living in Tongatapu (the main island) positively relates to the uptake of online transfer services and mobile money, probably because of a higher mobile phone ownership rate and the household internet access rate in Tongatapu compared to other islands (Tonga Statistics Department 2022a: 10, 18). Living in Tongatapu also has a negative association with the use of cash transfers.

Fourth, the simulation study reveals that switching the RSPs from two popular providers to the lowest-cost ones can bring a substantial benefit to Tongan households and the Tongan economy. We calculate the extent of gain that Tongan households and the Tongan economy would accrue if households who currently receive remittances from temporary migrants through Moneygram and Western Union switch to Ria in the Australia–Tonga corridor and to Ave Pa’anga Pau in the New Zealand–Tonga corridor. The results show that, for six months, Tongan households would gain 1,103,809 pa’anga, gaining 2.4% in the Australia–Tonga corridor. In the New Zealand–Tonga corridor, they would gain 424,596 pa’anga, or 2.3% of the total remittance sent by RSE workers. In total, the Tongan economy would gain 2.3% higher total remittances sent by the participants of the temporary migration programs, amounting to 1,528,405 pa’anga.

This research contributes to the literature about remittance costs and the policymaking arena by providing the first quantitative evidence about the choice of remittance channels and updating the gain by switching RSPs in the PICs. The research on remittance costs in the PICs has used descriptive statistics or qualitative methods (Raithatha et al. 2021; NRBT 2017; Dayrit et al. 2016). After the report by the World Bank, there has been no research calculating the gain made by switching RSPs in the PICs, although the popularity of RSPs has shifted over time (World Bank 2017b:38). This research unpacks the key factors that affect the households’ choice of remittance channels with multinomial logit regression, and, using the latest data in Tonga, recalculates the gain made by switching to the lowest-cost RSP.

The rest of this paper proceeds as follows. The next section explains the important role of remittances in economic development, remittance costs in the PICs, and the issues around remittances in Tonga. The third section explains two types of data used in this study. The fourth section presents the results in three subsections: The remittance costs and the choice of RSPs, the household traits affecting the choice of remittance channels, and the potential gain by switching RSPs. The fifth section illustrates the potential barriers to switching to low-cost RSPs in Tonga by reviewing the existing evidence. The last section concludes the paper with a summary and policy implications.

2. BACKGROUND

2.1 Why is Reducing Remittance Costs Important for Developing Countries and the PICs?

Migration and remittances improve household welfare and promote economic development in developing countries. The stock of international migrants has increased from 152 million to 280 million in the last three decades (UNDESA 2020). One driver of such active migration is a large income gap between developed and developing countries (World Bank 2023c: 2–4). People from developing countries migrate to secure better and more stable economic opportunities and send remittances back to families who remain in their home countries. Consequently, remittance inflows to low- and middle-income countries have grown from less than \$50 billion in 1990 to \$605 billion in 2021, which has sparked discussion on the development impacts of remittances. Existing evidence shows that remittances mainly contribute to poverty reduction through various channels, including increased income and consumption, the improvement of food security, human capital development, and narrowing the gender gap (World Bank 2023c: 127–143; Adams Jr and Cuecuecha 2010, 2013; Bouoiyour and Miftah 2016; Gibson and McKenzie 2014; Mansuri 2006; Mobarak, Sharif, and Shrestha 2020; Edwards 2023).

An important source of friction is the high remittance costs. The Sustainable Development Goals aim to reduce remittance costs to less than 3% and eliminate the remittance corridor with average costs higher than 5% (United Nations n.d.). Remittance Prices Worldwide is a website about remittance costs managed by the World Bank, providing remittance cost data on 367 corridors as well as reports about remittance costs across the globe. According to the website, as of the first quarter of 2023, the global average remittance cost is 6.25% with only 39% of major remittance corridors meeting the global target of 5% (World Bank 2023b). Thus, it is imperative to make efforts to reduce remittance costs, and thereby remittances will further uplift the living standard of people across the globe.

In this vein, Tonga and the other PICs attract special attention because of the long history of migration, the importance of remittances in their economic development, and the high remittance cost. The characteristics of small island developing states, such as geographical constraints and the small size of domestic markets pose difficulties for the PICs in promoting economic development and creating employment opportunities (World Bank 2017a). Within this context, migration mainly to Australia, New Zealand, and the United States (US) has, for many decades, provided opportunities to earn a stable income for the people from the PICs (Brown et al. 2006: 49–52; Doan et al. 2023: 2–3).

In recent years, the temporary migration programs by the governments of Australia and New Zealand have opened migration opportunities to low- and middle-skilled workers, becoming a crucial migration pathway for the people from the PICs (Doan et al. 2023:3–7). New Zealand launched Recognized Seasonal Employment (RSE) in 2007 while Australia established Seasonal Worker Program (SWP) in 2012 and the Pacific Labour Scheme (PLS) in 2019. In the near future, migration from the PICs to Australia and New Zealand is expected to grow because of the scale-up of temporary migration programs by both governments and the introduction of the Pacific Engagement Visa by the Australian government (Sharman 2022; Bedford 2023; Minister's Media Centre 2023).

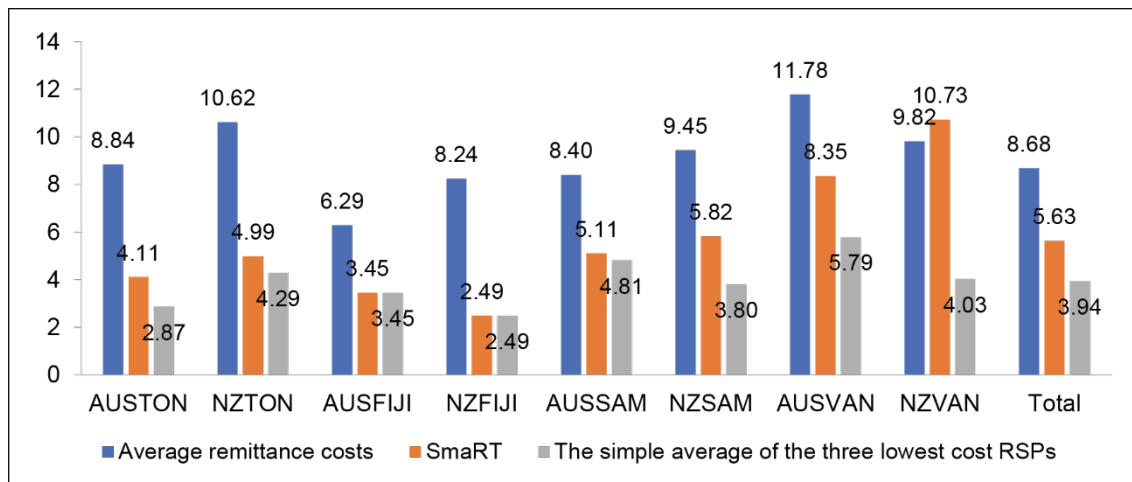
The importance of migration and remittances in the economy of the PICs is salient. Bertram and Watters (1985) refer to some of the PICs as the MIRAB economy, emphasizing the importance of Migration, Remittances, Aid, and Bureaucracy in their economy. Remittances are the key source of foreign exchange in Samoa and Tonga as the two PICs have recorded two of the highest remittance-to-GDP ratios in the world ranging from 15% to 50%.² Research also shows that remittances contribute to poverty alleviation and wealth accumulation in Fiji and Tonga and increase the expenditure on various goods, including food, housing, education, and community use in the PICs (Jimenez-Soto and Brown 2012; Brown et al. 2014; Brown and Jimenez 2008; Connell and Brown 2005). In Samoa and Tonga, remittances might be associated with financial development and economic growth (Jayaraman, Choong, and Kumar 2011). The temporary migration programs also improve the living standard of the PICs by increasing household income and consumption, upgrading the quality of dwellings, developing human capital, and shifting gender norms (Bailey 2015; Edwards 2023; Gibson and McKenzie 2014; World Bank 2017b).

Having said that, High remittance costs dampen the development impacts of remittances in the region. According to Remittance Prices Worldwide, the average remittance cost in the four PICs (Fiji, Samoa, Tonga, and Vanuatu) was 8.68% in the fourth quarter of 2022 (Figure 1). When we include other PICs by using the data from Send Money Pacific,³ the average cost further increases to 10.4% as of February 2021 (Raithatha, Farooq, and Sharma 2021:19). However, this does not mean that migrants and households from the PICs can choose only high-cost money transfer options. Smart Remitter Target (SmaRT),⁴ the average remittance costs of the three lowest-cost and accessible RSPs for sending \$200, shows that Fijian and Tongan migrants can send money at a cost of less than 5% to their home countries if they choose the low-cost providers (Figure 1).

² The data are obtained from World Development Indicators. Find the data from: <https://databank.worldbank.org/source/world-development-indicators>. The series name is "Personal remittances, received (% GDP)."

³ Send Money Pacific is a platform about remittance costs established through a joint initiative by the Australia and New Zealand government. The program aims to promote a better engagement of migrants with remittance service providers and to enable migrants to choose the remittance service providers best-suited to their needs. The data section describes the information provided on the website in detail. url: <https://sendmoneypacific.org/>.

⁴ Smart Remitter Target (SmaRT) is one of the indicators to measure remittance costs in remittance corridors. This indicator accounts not only for costs, but also other user perspectives, such as accessibility and the speed of transaction. This is achieved by dropping RSPs that do not satisfy four criteria. To obtain more information about SmaRT, go to the methodology paper from the link. url: https://remittanceprices.worldbank.org/sites/default/files/smart_methodology.pdf.

Figure 1: Remittance Costs in the Four PICs

AUS = Australia, NZ = New Zealand, TON = Tonga, FIJI = Fiji, SAM = Samoa, VAN = Vanuatu.

Source: Remittance Price Worldwide.

2.2 Remittance Market in Tonga

One reason why low-cost transfer services operate in Tonga is that the country has established a relatively mature remittance market among the PICs. More than 28 RSPs including global MTOs such as Moneygram and Western Union, small and localized MTOs such as Ave Pa'anga Pau and Island Flexi, mobile money like KlickEx, and commercial banks currently operate in Tonga (PACER Plus 2023: 13–15). This figure is close to the number of RSPs operating in Fiji (25) and Samoa (23), and much higher than in Papua New Guinea (13), Solomon Islands (11), Vanuatu (13), and Kiribati (8) (PACER Plus 2023: 13–16; Raithatha, Farooq, and Sharma 2021: 57–58).

The introduction of low-cost transfer services in Tonga was also earlier than in other PICs. Tonga is the second country in which Digicel launched a mobile money service in 2011 after Fiji (Raithatha, Farooq, and Sharma 2021: 31). The Tonga Development Bank (TDB) introduced a localized low-cost money transfer service, Ave Pa'anga Pau, in cooperation with the International Finance Corporation to reduce remittance costs in the New Zealand–Tonga corridor in 2017, and in the Australia–Tonga corridor in 2020.

Nevertheless, the choice of remittance channel by households keeps the remittance costs high. A report from the National Reserve Bank of Tonga mentions that 83% of remittances were transacted through Western Union in 2016, losing 12% of remittances because of fixed fees and exchange rate losses (NRBT 2017: 22–23). Digicel Mobile Money had 16,000 active users out of the 105,000 population in 2011 but only 6% of the respondents answered that they used mobile money in 2016 (Dayrit et al. 2016:10; NRBT 2017: 22).

3. DATA

We use two types of remittance data: (i) individual and household surveys, and (ii) a data set collected by regular monitoring of remittance costs of RSPs. The survey data is the first round of the Pacific Labor Mobility Survey (PLMS). The PLMS is a large size of household and individual survey, focusing on the issues of temporary migration between Australia, New Zealand, and the PICs. It consists of individual, household,

and worker surveys, covering Tonga, Vanuatu, and Kiribati. We focus on the face-to-face Tongan individual and household survey collected from November 2021 to January 2022 because it contains richer information about remittances. We also use the phone-based worker survey collected from December 2022 to March 2023. The supplementary Tongan data were collected via phone call because the pandemic and the Hunga Tonga–Hunga Ha’apai volcanic eruption and subsequent tsunami disrupted the implementation of the face-to-face survey. We decided not to combine the face-to-face survey with the supplemental phone-based survey because of the inconsistency in questions between them and issues in the latest combined data set.⁵

The household survey consists of 1,160 households and 7,359 individuals, including 543 households with temporary migrants and 617 households without temporary migrants. The sampling area in Tonga includes four residential islands, Tongatapu, ‘Eua, Ha’apai, and Vava’u. The survey contains information on 1) household demography, 2) education, 3) children, 4) employment and income, 5) expenditure, 6) housing and assets, 7) remittances, 8) gender, 9) self-evaluation about temporary migration programs, 10) The impacts of COVID-19, and 11) social impacts of temporary migration programs.

The worker survey contains a total of 762 Tongan temporary migrants. The workers are currently participating in the temporary migration programs or have returned to Tonga. Among them, 360 workers are participants of the SWP, 193 workers are participants of the PLS, and 209 workers are participants of RSE. The worker survey collected information on 1) sociodemographics, 2) health, 3) employment and income, 4) expenditure, 5) remittances, 6) migration, 7) COVID-19, 8) social impact of migration, and 9) gender.

The descriptive statistics about the main remittance channels and RSPs show that MTOs such as Moneygram and Western Union have dominant market shares. Table 1 shows that more than 80% of 950 households mainly use MTOs for receiving remittances. Among those who use MTOs, 456 households (47.6%) receive remittances by cash while 324 households (33.8%) use online services. Online bank transfers come to a third with 119 households using it (12.4%) followed by mobile money, used by 55 households (5.7%). Travel restrictions during the pandemic made the informal channels the least popular, with only one household receiving money informally through friends.

**Table 1: The Main Remittance Channels Reported
by Respondents in the Household Survey**

Main Channel	Freq.	%
Online transfer through banks	119	12.41
Online transfer through money transfer operators, such as Western Union, MoneyGram, etc.	324	33.79
Over-the-counter transfer through money transfer operator, such as Western Union, MoneyGram, etc.	456	47.55
Mobile wallet (e.g., KlickEx Pacific)	55	5.74
Through friends	1	0.10
Other	4	0.42
Total	959	100.00

⁵ See the Appendix for detail of the issues in the combined data, submitted by a contracted company.

The same question in the worker survey presents a different picture, with online transfers proving more popular. Table 2 shows that, although the worker survey does not distinguish online transfers by MTOs and banks, 69.9% of migrants responded that they sent remittances through online transfers, while only 25.6% used over-the-counter transfers. Mobile money remained unpopular, occupying only 1.74%. Due to the easing of travel restrictions after December 2022, 19 migrants reported they used informal transfers through friends.

Table 2: The Main Remittance Channels Reported by Temporary Migrants in the Worker Survey

Main Channel	Freq.	%
Online transfer	522	69.88
Over-the-counter transfer	191	25.57
Mobile wallet	13	1.74
Through friends	19	2.54
Other	2	0.27
Total	747	100.00

This difference between the household survey and the worker survey can be rooted in three things. First, the household survey also includes households receiving remittances from migrants who have migrated overseas but not through the temporary migration programs. Table A1 in the appendices shows that, after restricting the sample to households with participants of temporary migration programs, the share of remittance channel becomes similar. Second, workers are not necessarily from the same households as those in the face-to-face household survey because of the connection issue between the two data sets. Third, as noted in the data section, the two surveys collected data during different sampling periods with different methods.

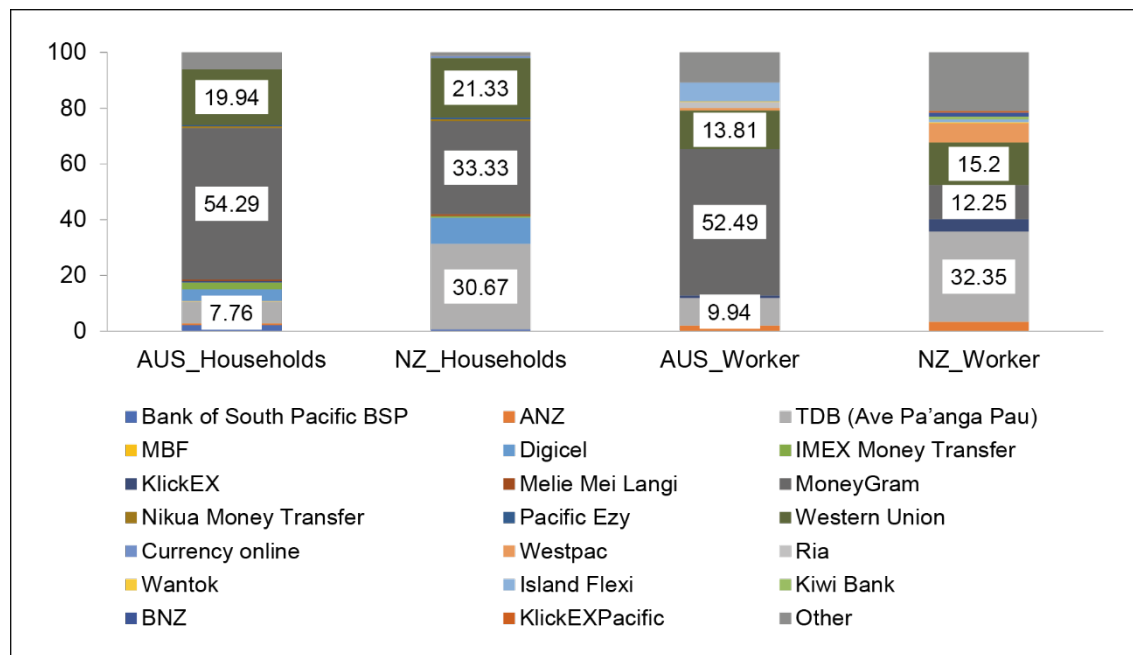
Figure 2 shows the main RSPs used by Tongan households with temporary migrants in Australia and New Zealand, respectively. The most popular RSP in both remittance corridors is Moneygram, which accounts for 54.3% in the Australia–Tonga corridor and 33.3% in the New Zealand–Tonga corridor. Western Union is also popular among them, accounting for 19.9% and 21.3%, respectively. One notable difference in the choice of RSPs between the two corridors is that Ave Pa’anga Pau (TDB) has gained much more popularity in the New Zealand–Tonga corridor at 30.7% compared to the Australia–Tonga corridor at only 7.8%. This is probably because Ave Pa’anga Pau launched the service in New Zealand three years earlier than in Australia in 2017. Digicel, one of the mobile money agents, is less popular than the three RSPs, with only 4.2% and 9.3% of households using it in the Australia– and New Zealand–Tonga corridors, respectively.

Figure 2 also shows similar market shares of RSPs from the worker survey. In the Australia–Tonga corridor, Moneygram is the most popular RSP with 52.5% of migrants using it, followed by Western Union (13.8%). In New Zealand, Ave Pa’anga Pau is the most popular RSP, accounting for 32.4% of the total share whereas only 9.9% of temporary workers in Australia used it. Western Union and Moneygram are still popular in New Zealand, occupying 15.2% and 12.3% of the total share. In both corridors, many migrants answered “Other (Specify).”⁶ This includes localized RSPs such as

⁶ One interesting observation is that 18 migrants answered “Koloa Fakatau,” which means grocery shop in the Tongan language. In Tonga, local grocery shops can receive remittances for specific consumption

Mosimani Money Transfer and Palu Money Transfer and some unspecified mobile money (Table A7 in Appendix).

Figure 2: The Use of RSPs by Tongan Households and Workers
(%)



Source: The graph is created by the author from the PLMS data.

To complement the survey data, we conducted regular monitoring of two platforms of remittance costs in the PICs from the 25 July 2023 to the 7 August 2023. Send Money Pacific (SMP) provides remittance cost data for RSPs with different transfer methods, such as the remittances received in local currency, the fixed fee, the exchange rate, the total remittance costs in percentage, and the speed of transfers. The platform covers the remittance corridors from Australia and New Zealand to 10 Pacific Island countries (Fiji, Kiribati, PNG, Samoa, Solomon Islands, Tonga, Vanuatu, Tuvalu, Cook Islands, Niue) and Timor-Leste. The data are updated every Thursday afternoon, and we can compare the remittance costs when sending A\$/NZ\$200 and 500 to the 11 countries.

The other platform, Saver Pacific (SP), provides similar data, but the timing of data updates is irregular, and the website updates some of the RSPs such as ANZ, KlickEX, and OFX every day. Such a difference in the data update makes the remittance costs of the same RSPs shown in SP different from those in SMP because of the fluctuation of exchange rates. Taking Ave Pa'anga Pau in the New Zealand–Tonga corridor as an example, on the 25 July 2023, SMP shows that migrants can send 282.72 pa'anga with zero fixed fees and an exchange rate of NZ\$1 equaling 1.41 pa'anga. SP presents a higher amount of remittance at 284.10 pa'anga with zero fixed fees and an exchange rate of NZ\$1 equaling 1.42 pa'anga.

purposes such that the money must be spent on food, daily needs, and other necessities. Thus, those who answer “Koloa Fakatau” might imply such “in-kind” remittances.

There is also a difference in the number of RSPs between the two websites. As of 3 August 2023, SMP presents 35 options with 14 RSPs, depending on different transfer methods such as online account to mobile phone, bank account to bank account, and cash to cash in the Australia–Tonga corridor. For the New Zealand–Tonga corridor, the website shows 29 options with 14 RSPs. Compared to SMP, SP shows a smaller number of options, presenting the costs of 21 options with 15 RSPs in the Australia–Tonga corridor and 16 options with 12 RSPs in the New Zealand–Tonga corridor.

We collected the following data on remittance costs when migrants send remittances of A\$/NZ\$200: the remittances received in local currency, the fixed fee, the exchange rate, the total remittance costs in percentage, transfer methods, and the speed of transaction. As for RSPs, we collected the data for the five lowest-cost RSPs and the highest-cost RSP in both corridors to examine the variation of remittance costs and collected remittance data for two popular RSPs, Moneygram and Western Union in order to calculate the gain made by switching to the lowest-cost RSP.

Since SP does not provide the total remittance costs in percentages, we calculate the remittance costs in percentages for SP. We first calculate the remittances received in the local currency (pa'anga) when migrants send A\$/NZ\$200 (Rem_{max}) with the exchange rate on the date of the data update.⁷ We then calculate the remittance costs in percentage with the equation below.

$$\frac{(Rem_{max} - Rem_{RSPs})}{Rem_{max}} \cdot 100 \quad (1)$$

where Rem_{RSPs} is the amount of remittances received when the household sends A\$/NZ\$200 with an RSP.

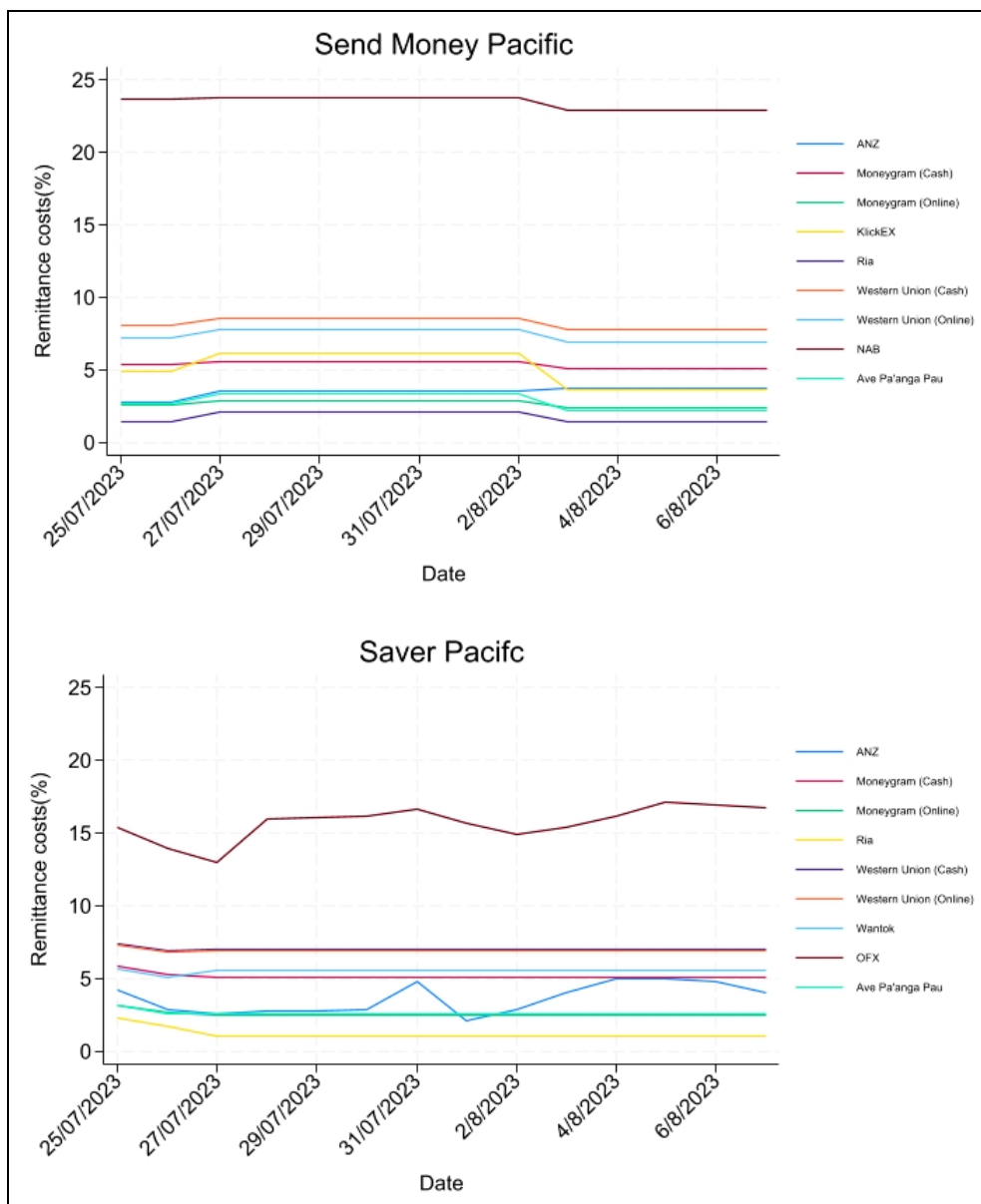
4. RESULTS

4.1 The Choice of RSPs Increases Remittance Costs

The audit data show that Tongan households face a large variation in remittance costs across different RSPs. Figure 3 shows that, in the Australia–Tonga corridor, Ria provides the lowest-cost remittance services, with average costs of 1.76% (SMP) and 1.21% (SP) when they send money from bank accounts to mobile money. The data also present a stark gap between Ria and the highest-cost RSPs. NAB (SMP) and OFX (SP) have a higher cost than Ria by 23.4 percentage points and by 15.73 percentage points, respectively, or around 14 times higher remittance cost. In addition to Ria, migrants can send money at a cost of less than 5% by using three other RSPs. The average remittance costs of online transfers of Moneygram are 2.64% (SMP) and 2.51% (SP). A localized MTO, Ave Pa'anga Pau, has the cost advantages, with remittance costs at 2.85% (SMP) and 2.63% (SP). Surprisingly, a commercial bank also has cost advantages with ANZ, recording average remittance costs of 3.47% (SMP) and 3.63% (SP) when the users send money online.

⁷ We obtained the exchange rate from Exchange Rates UK. url: <https://www.exchangerates.org.uk/>.

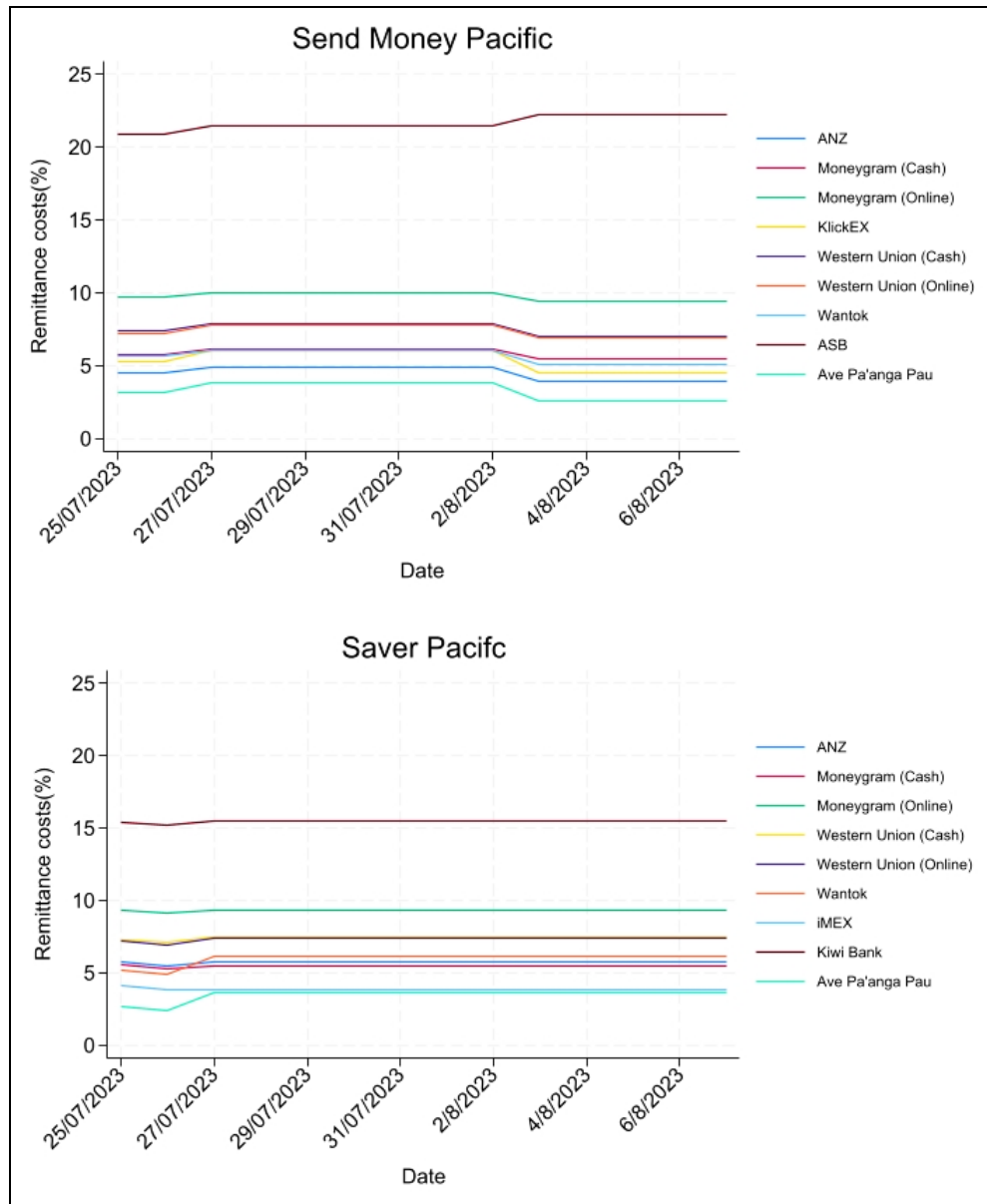
Figure 3: Remittance Costs in the Australia–Tonga Corridor
(%)



Source: The graph is created by the author from the audit data.

Figure 4 shows that, in the New Zealand–Tonga corridor, a local RSP, Ave Pa'anga Pau, provides the best service with average costs of 3.33% (SMP) and 3.53% (SP). Ave Pa'anga Pau users in New Zealand can send remittances at a fraction of the cost of using ASB (SMP) or Kiwi Bank (SP). According to SP data, iMEX, which is another localized MTO, also operates low-cost remittance services, with an average cost of 3.85%. But SMP does not provide information about iMEX. SMP data show that the average cost of ANZ is 4.52%, but it is not robust since SP data present a higher average cost of 5.74%.

Figure 4: Remittance Costs in the New Zealand–Tonga Corridor (%)



Source: The graph is created by the author from the audit data.

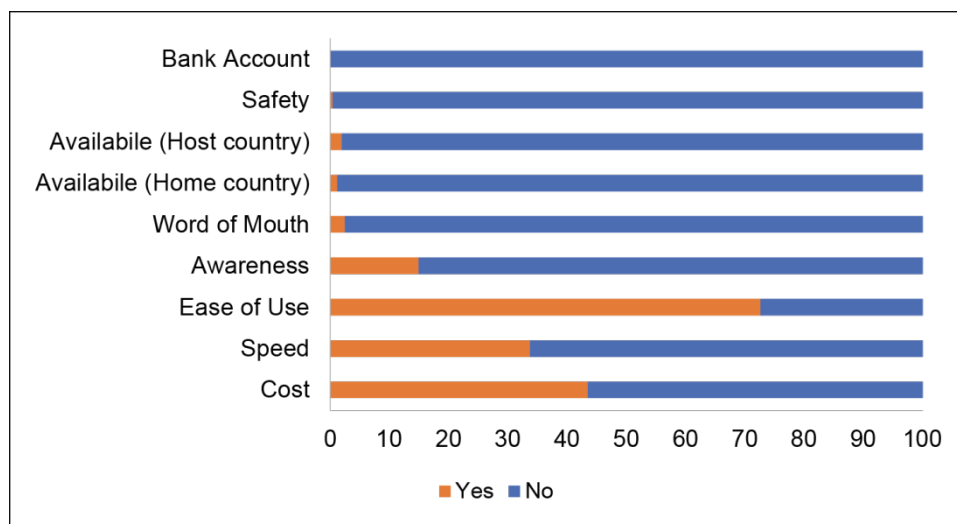
This result indicates that most Tongan households pay much higher remittance costs due to their use of high-cost RSPs. In the Australia–Tonga corridor, both household and worker surveys show that Moneygram is the most popular RSP, providing a low-cost online transfer service (Figure 2), but 44.39% of households using Moneygram to receive money in cash (Table A5 in Appendix). In the other popular RSP, Western Union, costs are 5.6 to 6.5 percentage points higher than Ria. Having said that, this observation confirms a gradual and favorable shift in the choice of RSPs. Western Union has lost its share among Tongan migrants since nearly 98% of SWP workers from the PICs including Tonga sent remittances through Western Union from 2015 to 2017 (World Bank 2017b: 38). Instead, there is a growth in new and low-cost RSPs, such as Ave Pa'anga Pau and KlickEX, of more than 10% if their shares are combined.

In the New Zealand–Tonga corridor, such a shift is more outstanding. Some 30.7% of households and 32.4% of workers reported they used the lowest-cost RSP, Ave Pa’anga Pau (Figure 2). However, the household survey shows that 54.7% of households receive money through the high-cost RSPs, Moneygram, and Western Union, meaning that they pay around 5.8 to 9.7% in remittance costs. However, the share of the two MTOs decreases to 27.8% in the worker survey.

Given the high share of the high-cost RSPs, the next question is “What makes Tongan households choose high-cost rather than low-cost RSPs?” The worker survey indicates that they choose a high-cost RSP because it is the easiest to use compared to other services and migrants are less reactive to the cost advantage of remittance services. The survey asked binary questions about the reason why they chose remittance channels (online transfers, over-the-counter transfers, mobile money, through friends, and others). Migrants answered yes or no on multiple factors: cost, speed, ease of use, awareness, word of mouth, availability in home countries, availability in host countries, safety, and bank account ownership.⁸

Figure 5 shows that migrants choose remittance channels because of three factors: ease of use (72.6%), cost (43.5%), and speed (33.7%). The users of Western Union and cash transfers with Moneygram have similar characteristics. Figure 6 shows that 79.9% of them choose remittance channels because of the ease of use, followed by cost (38.0%) and speed (34.2%). It is thus reasonable that the Tongan households do not use Ria because it only has one agent in Tongatapu and it is new to Tongan households. On the other hand, the users of Ave Pa’anga Pau pay more attention to cost (60.9%) although ease of use is still the most popular reason for using it, at 67% (Figure 7). A gap in the percentage of cost is suggestive that those who keep using Moneygram and Western Union might not be incentivized by cost advantages, but stick to the favorable MTOs because they prioritize the ease of use in choosing RSPs.

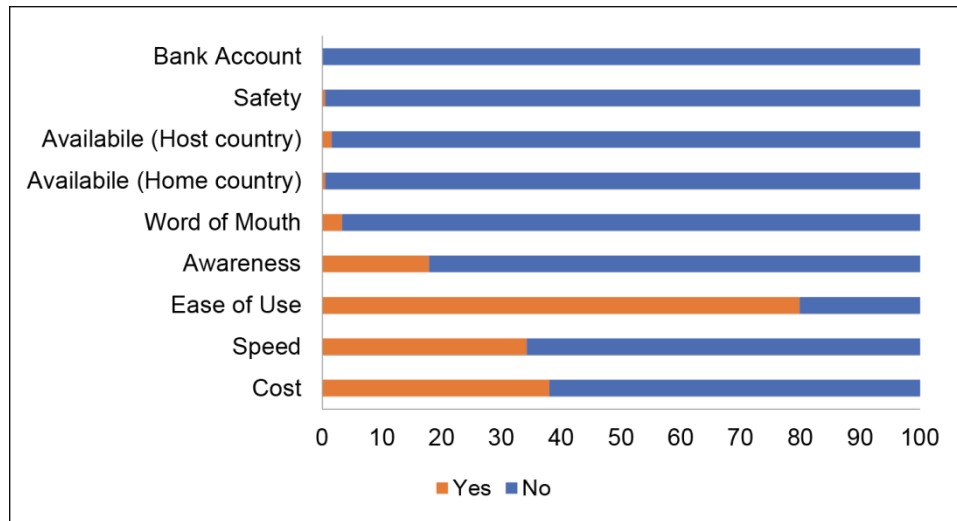
Figure 5: The Reason Why Tongan Migrants Choose Remittance Channels (%)



Source: The graph is created by the author from the PLMS data.

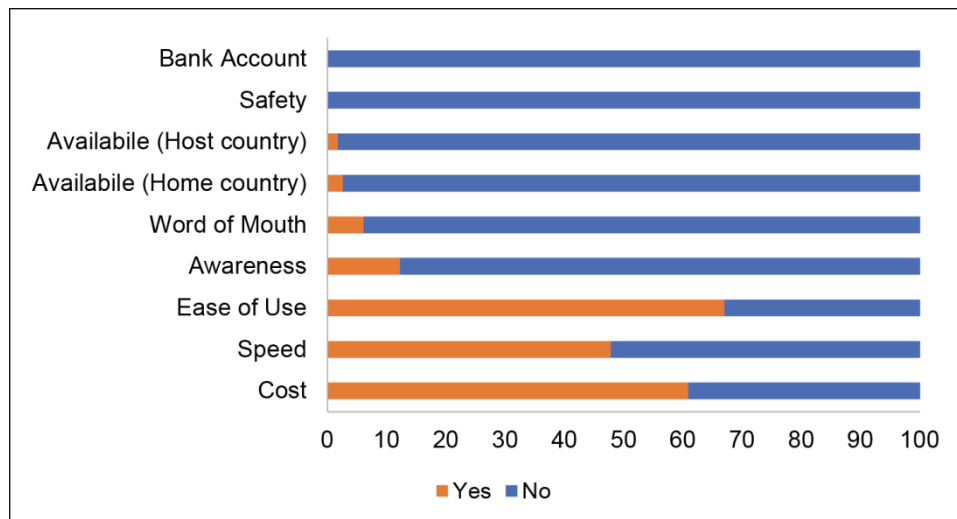
⁸ The questions and labeling are listed in the Appendix.

Figure 6: The Reason why Tongan Migrants Who Use Western Union and Moneygram Choose Remittance Channels (%)



Source: The graph is created by the author from the PLMS data.

Figure 7: The Reason Why Tongan Migrants Who Use Ave Pa'anga Pau Choose Remittance Channels (%)



Source: The graph is created by the author from the PLMS data.

4.2 Household Characteristics and the Choice of Remittance Channels

To understand how household characteristics affect the choice of remittance channels, we estimate a multinomial logit regression model, following the existing literature about the choice between the formal and informal channels (Karafolas and Konteos 2010; Siegel and Lücke 2013; Kosse and Vermeulen 2014; Amuedo-Dorantes and Pozo 2005; Amuedo-Dorantes et al. 2005; Maclsaac 2023). This paper has two differences from the modeling in previous literature. First, the previous papers have controlled

the three stages of the choice of remittance channels—remitter in the destination countries, MTOs, and households in the destination countries—by applying the first-to-last mile framework (Hernandez-Coss 2005). However, our research examines only the last mile of decision-making by using information about the households in Tonga because the face-to-face household survey and the worker survey are not linked well.⁹ Second, this paper calculates the average marginal effects rather than the relative risk ratio to interpret the effects of explanatory variables because we want to independently understand the factors associated with remittance channels including the baseline outcome.

The outcome variable is a polychotomous variable with four remittance channels: 1. online transfer through bank, 2. online transfer through MTOs, 3. over-the-counter transfer through MTOs, and 4. mobile money. The question in the PLMS contains six categories, but we drop two remittance channels, “Through friends” and “Others,” because only a very small share of the respondents uses these channels. The baseline is the over-the-counter transfer through MTOs. Following Amuedo-Dorantes and Pozo (2005), we assume that households decide on the MTO to maximize the utility:

$$U_{ij} = \beta'_j x_{ij} + \varepsilon_{ij} \quad (2)$$

where U_{ij} represents the utility of households i when they choose remittance channel j , and x_{ij} is the vector of explanatory variables. The probability that the household i uses the j th remittance channel is given by:

$$P_j(Y_i = j) = \frac{\exp(\beta'_j x_{ij})}{1 + \sum_{k=1, k \neq 3}^4 \exp(\beta'_k x_{ij})} \quad (3)$$

where β_j is the coefficient estimated by maximum likelihood.

We attempted to mainly control four factors when modelling household decision-making on the remittance channels. The first factor is the chance of finding or searching for information about remittance costs. Qualitative research suggests that word of mouth plays a vital role in switching to online financial services. Group discussions in seven African countries suggest that recommendations from friends and family, both via in-person and SNS, encourage people to change transfer methods from cash to online (FSD Africa 2018: 30–31). Word of mouth also helps to build trust in digital financial services like mobile money, which leads to regular usage of online services (Cohen 2014: 13). Quantitative research also supports the importance of social networks in choosing remittance channels. Amuedo-Dorantes and Pozo (2005) show that Mexican migrants who have Mexican friends in the host city in the US are more likely to choose formal channels rather than informal channels in the US–Mexico corridor.

We use two variables to account for this channel. The first proxy is a categorical variable that classifies the participation status of the temporary migration programs in Australia and New Zealand. The variable controls the current chance of being exposed to new information and experiences in temporary migration. Temporary migrants can get new information about remittance costs through migrant communities and they might voluntarily search for information about those costs. The variable equals 0 if

⁹ In Africa, interviews with recipients of remittances reveal that the recipients of remittances play a major role in deciding the remittance channels (FSD Africa 2018: 29).

households do not have temporary migrants, 1 if households have temporary migrants participating in the program for the first time, and 2 if households have repeated migrants who have participated in the program multiple times. In the regression, we use the households without temporary migrants as the baseline.

The second proxy is a binary variable for living experience in Australia and New Zealand in the past. It takes the value of 1 if any household member has lived more than one month in Australia or New Zealand in the past, and 0 otherwise. In a similar idea, it accounts for the exposure to information about remittance costs in the past and potential information flows, thanks to the connection they built in Australia and New Zealand.

The second factor is education level. Even without information from other people, a better-educated individual will be more likely to have and be able to use information about remittance costs because of better financial and digital literacy. Previous research shows that migrants who completed secondary education are more likely to choose formal channels compared to those who do not graduate from secondary school because of a better comprehension of the risk of informal channels and the remittance markets in both destination and origin countries (Amuedo-Dorantes and Pozo 2005; Kosse and Vermeulen 2014; Siegel and Lücke 2013). To account for the education level of households, we use the share of individuals who completed secondary school in the household members aged 18 or over.

The third factor is access to remittance channels. In Africa, the convenience of cash transfer and habitual behavior relates to the choices of remittance channels (FSD Africa 2018: 37–41). When the agents of high-cost MTOs are located close to the recipient's home, households can stick to using cash transfers even after they are aware of online services with a lower remittance cost. Hernandez-Coss (2005) finds that improving access to the formal channels expanded the take-up of formal channels in the US–Mexico corridor. Kosse and Vermeulen (2014) mention that living in urban areas and the density of ATMs affect the migrants' choice of remittance channels. In our study, we try to account for this channel with the dummy variable for residential islands, which takes the value of 1 if the household resides in Tongatapu, and 0 otherwise. The data about the travel costs to the agent of MTOs are not available, but residential islands can substitute information about the travel costs and the geographical differences in financial institutions since the number of access points of MTOs and banks differs across the four residential islands (NRBT 2017: 40–41).

Another key factor is the amount and frequency of remittances because the choice of remittance channels can depend on diverse needs and the role of remittances in household finance. Previous research includes the value of the remittances as an explanatory variable, but the effect depends on the context. Kosse and Vermeulen (2014) argue that the amount of the remittance is an important factor because a higher amount of remittance decreases the probability of remitting through informal intermediaries, ATM withdrawal, and carrying cash by hand among the migrants staying in the Netherlands. Amuedo-Dorantes and Pozo (2005) find that a higher amount of remittances is associated with the use of unspecified remittance channels rather than bank or MTOs for Mexican migrants in the US. Siegel and Lücke (2013) find that there is no association between the amount of the remittance and the choice of remittance channels in Moldova. In our study, we use a monthly remittance received as an explanatory variable.

Different usages of remittances affect their frequency. In Tonga, households use remittances mainly for three purposes: daily needs, including church donations (Bedford, Bedford, and Nunns et al. 2020: 68–70; Maeda and Edwards 2023), education and the improvement of their dwelling (Bedford, Bedford, and Nunns 2020; World Bank 2017b: 47–49), and special events such as funerals and Christmas from international remittances (Fifita 2021; Connell and Brown 2005: 30–37). Migrants from households who use remittances for daily expenditures need to remit a small amount more frequently than other migrants. In contrast, migrants who only need to remit for emergencies or the festive expenditures send a large amount of money occasionally rather than on a regular basis.

The PLMS asks about the frequency of remittances with five categories: 1. Monthly or more frequent, 2. Every two months, 3. Every three months, 4. Every four to six months, and 5. Only on special occasions. For analytical purposes, we modified this categorical variable into three categories. The first category is “Monthly or more frequent,” which accounts for households who use remittances for daily needs. The second category is “Every two to six months,” which accounts for households who spend remittances on larger, but less frequent spending, like housing or education. The third category is “Only on special occasions,” which accounts for households who receive remittances only for emergencies and festive occasions. In the regression, we use the third category as the baseline.

We include the other two explanatory variables in our model. Monthly saving per head captures the use of bank transfers because the recipient households do not necessarily deposit remittances in their bank account if they send and receive remittances by cash. The number of adults relates to the cost of receiving remittances by cash. When people receive remittances at the MTO’s agent, they have to queue for a long time. A greater number of adults reduces the costs of queuing at the agent because it affects the time allocation of household members to a lesser extent by distributing care work and chores to those household members who are not formally employed.

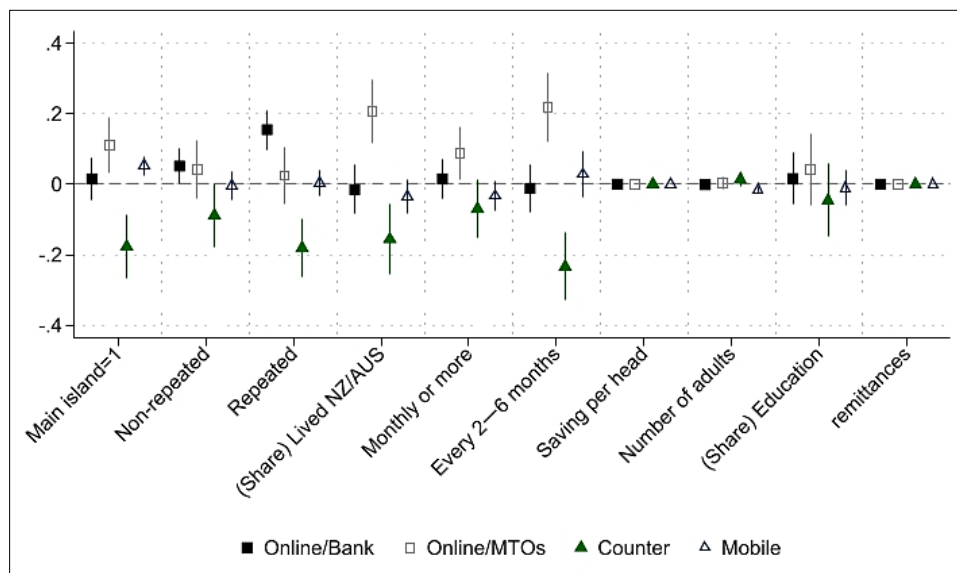
Table 3 presents the summary statistics. Households using online transfers or mobile money receive more remittances than those using cash transfers. Households receiving money through online bank transfers possess a greater amount of savings and have a richer migration experience than the other groups. Mobile money users receive remittances most frequently, on average, followed by households using cash transfers, but the number of adults in the households is the least among the four groups. Households receiving money by cash transfers are more likely to live in the outer islands and less likely to have rich migration experiences.

The estimation results are shown in Figure 8. They reveal that three key household factors exist in the choice of remittance channels. The exposure to information about accessibility to MTOs, remittance costs, and frequency of remittances would urge households to use online transfers rather than cash transfers.

Table 3: Summary Statistics of Explanatory Variables

	Online/ Bank	Online/ MTOs	Cash	Mobile Money
Living in Tongatapu (Yes = 1)	.862 (.346)	.873 (.334)	.748 (.434)	.926 (.264)
Temporary migration status				
No migrants (Yes = 1)	.198 (.400)	.339 (.474)	.510 (.500)	.407 (.496)
First time (Yes = 1)	.190 (.394)	.248 (.433)	.209 (.407)	.204 (.407)
Repeated (Yes =1)	.612 (.198)	.413 (.339)	.281 (.510)	.389 (.407)
Past migration (Yes = 1)	.605 (.276)	.652 (.268)	.551 (.354)	.551 (.333)
Frequency of remittances				
Monthly (Yes = 1)	.698 (.461)	.640 (.481)	.581 (.494)	.500 (.505)
2–6 months (Yes = 1)	.138 (.346)	.214 (.411)	.140 (.348)	.278 (.452)
On request (Yes = 1)	.164 (.372)	.146 (.354)	.278 (.449)	.222 (.420)
Monthly remittances (Pa'anga)	876.121 (1,031.385)	900.642 (1,252.912)	566.577 (1,021.680)	740.340 (1,099.312)
Monthly saving per head (Pa'anga)	174.828 (844.35)	71.600 (228.183)	79.196 (278.038)	73.229 (243.497)
Number of adults	3.259 (1.818)	3.295 (1.677)	3.339 (1.739)	2.685 (1.412)
The share of adults who completed secondary education	.322 (.311)	.344 (.293)	.317 (.299)	.303 (.305)

MTO = money transfer operator.

Figure 8: Average Marginal Effects

The result of the residential islands gives a mixed picture of the choice around remittance channels. We expected that living in Tongatapu would be associated with a higher probability of using over-the-counter transfers through MTOs compared to other islands, because a better access to financial access points of MTOs can induce households to stick to using over-the-counter transfers (NRBT 2017: 40–41; FSD Africa 2018: 37–41). However, the result is the opposite, showing that households living in Tongatapu have a lower probability of using over-the-counter transfers through MTOs by 17.8 percentage points, while having a higher probability of using online transfers through MTOs by 11.0 percentage points. Living in Tongatapu also leads to a higher take-up of mobile money by 5.2 percentage points compared to other islands. This is probably because of a higher rate of mobile phone ownership and mobile data usage in Tongatapu than in the other three islands (Tonga Statistics Department 2022a: 10; Tonga Statistics Department 2022b: 137–138).

The current participation in the temporary migration programs makes cash transfers a less attractive option for remittances but leads to a higher probability of using online transfers through banks. Households with a temporary migrant who participated in the temporary migration programs for the first time have an 8.9 percentage point lower probability of using the over-the-counter transfers compared to those households without any participants of the temporary migration programs while keeping other factors constant. When households have repeated participants in the temporary migration programs, they are 18.2 percentage points less likely to use the over-the-counter transfers. On the other hand, households with a participant of the temporary migration programs for the first time have a 5.2 percentage point higher probability of using online transfer through banks. Those with repeated migrants have a higher probability of using online transfers through banks by 15.5 percentage points. Such changes occur probably because households become aware of a relatively higher cost of cash transfers as the audit data show the price advantage of online bank transfers over cash transfers through MTOs.

Past migration experience provides opportunities to switch to online transfers. Households with living experiences in Australia and New Zealand for more than one month have a lower probability of using cash transfers by 15.6 percentage points, whereas they have a higher probability of receiving remittances with online transfers through MTOs by 20.6 percentage points.

For the remitting characteristics, frequent remittance drives a shift from cash transfers to online transfers within MTOs. Households who send remittances every month or more frequently have a lower probability of using over-the-counter transfers through MTOs by 7.0 percentage points compared to those households who receive remittances on request at the significance level of 10%. They also have a higher probability of using online transfers through MTOs by 8.8 percentage points. Households who send remittances every two to six months show a larger effect, with a 23.4 percentage point lower probability of using over-the-counter transfers through MTOs and a 21.8 percentage point higher probability of using online transfers through MTOs. Unlike the frequency, we find that the amount of remittances is not associated with the choice of remittance channels. The coefficients of a monthly remittance received per head are statistically insignificant at a 10% level or the magnitude of the coefficient is small.

In contrast to the previous literature, we find that education level is not an important factor. The coefficients for the education level of households are statistically insignificant at the 10% level. As for the other two covariates, households with a greater number of adults have a lower probability of using mobile money by 1.6 percentage points, but this does not relate to a probability of using cash transfers

through MTOs. The coefficients of the monthly saving per head are statistically insignificant at a 10% level or the magnitude of the coefficient is too small.

4.3 Simulation: How Much Would Be the Gain Made by Switching RSPs?

When policymakers try to intervene in the choice of remittance channels and RSPs, one important question is how much the intervention would benefit the affected citizens. We calculate the potential gain by switching from the two popular MTOs, Moneygram and Western Union, to the lowest cost RSPs, Ria in the Australia–Tonga corridor and Ave Pa’anga Pau in the New Zealand–Tonga corridor. Data for households with temporary migrants are used to calculate the gain because we can identify the remittance corridor that the household belongs to.

Figure 9 shows three steps of our simulation. First, we derive the gain per transaction of 200 AUD/NZD by calculating the difference between the cost of the lowest-cost RSP and the two popular MTOs in both local currency and the percentage of remittance costs. We use data for both cash and online transfers for Moneygram and Western Union. Second, we derive the average remittances sent in six months by Tongan temporary migrants in Australia and New Zealand from the worker survey, respectively. On average, Tongan temporary migrants in Australia send A\$8,116.5 (12,695.7 Pa’anga), and RSE workers in New Zealand send NZ\$9,265.3 (13,410.2 Pa’anga) in six months. We obtained the multiplier, 40.58 for Australia and 46.33 for New Zealand, by dividing the average remittances by A\$/NZ\$200. These multipliers are then used to calculate the per-household gain in six months made by switching providers. Third, we calculated the gain of the Tongan economy by multiplying the gain per household by the number of temporary migrants in Australia and New Zealand on 30 April 2023. There were 3,692 and 1,386 participants of the temporary migration programs in Australia and New Zealand, respectively (Department of Home Affairs 2023; Ministry of Business, Innovation and Employment 2023).

Figure 9: Simulation Study

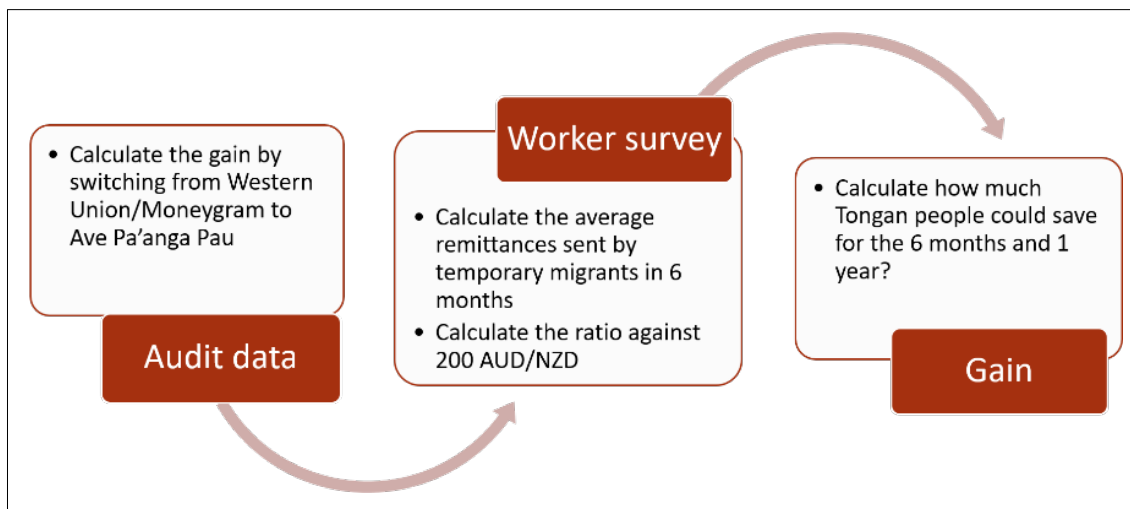


Table 4 shows the simulation results based on data from SMP. Households who use online transfers through Moneygram would gain 0.88% if they switched to Ria. If households switched from cash transfers with Moneygram to Ria, they would gain 3.64%. Those households who use Western Union could gain a larger amount, saving 5.62% for online transfers and 6.47% for cash transfers. If all households who use Moneygram and Western Union switched to Ria, the Tongan economy would be able to receive 1,103,809 Pa'anga more in a six-month period, amounting to 2.4% of the remittances sent by Tongan temporary migrants in Australia.

Table 4: The Gain Made by Switching Based on Send Money Pacific

	Australia–Tonga				New Zealand–Tonga				Total
	WU (Online)	WU (Cash)	MG (Online)	MG (Cash)	WU (Online)	WU (Cash)	MG (Online)	MG (Cash)	
Remittance costs (%)	7.38	8.23	2.64	5.4	7.39	7.53	9.73	5.84	
Gain by switching (%)	5.62	6.47	0.88	3.64	4.07	4.20	6.40	2.51	
Gain in 6 months (TOP and %)		1,103,809 TOP (2.4%)				424,596 TOP (2.3%)			1,528,405 TOP (2.3%)

MG = Moneygram, WU = Western Union.

In the New Zealand–Tonga corridor, compared to the case in Australia, households who send and receive money through Moneygram would be able to save a greater amount of money by switching to Ave Pa'anga Pau. Households who use online transfers could save 6.4% of remittances when they send 200 NZD, while those who use cash transfers would gain 2.51%. Those households who use Western Union could save 4.07% for online transfers and 4.20% for cash transfers. If all these households switched to Ave Pa'anga Pau, the Tongan economy would be able to save 424,596 Pa'anga, amounting to 2.3% of the remittances sent by RSE workers. In total, the gain of the Tongan economy would equal 1,528,405 Pa'anga which is 2.3% of the estimated total remittances sent by temporary migrants in the two destination countries.

For the robustness check, we did the same simulation analysis with data from SP. Table 5 shows that the results are slightly different, but still similar. In the Australia–Tonga corridor, the total gain by switching becomes 0.1 percentage points larger than the main result. This is because the gain of the main channel, Moneygram, becomes larger compared to the SMP results. The gain for online transfers is 0.42 percentage points higher at 1.3% and the gain for cash transfers is 0.32 percentage points higher at 3.96%. For households who send and receive money with Western Union, households who use online transfers would gain 5.73% while households who use cash transfers would save 5.83%. In the New Zealand–Tonga corridor, all estimated gain is lower compared to the results from SMP data. Those who use online and cash transfers of Moneygram would save 5.77% and 1.95%, respectively. Western Union users could save 4.07% if they use online transfers and 4.20% if they use cash transfers. In total, the gain by switching is 0.1 percentage points higher than the SMP results at 2.4%, amounting to 1,572,246 pa'anga.

Table 5: The Gain Made by Switching Based on Saver Pacific

	Australia–Tonga				New Zealand–Tonga				Total
	WU (Online)	WU (Cash)	MG (Online)	MG (Cash)	WU (Online)	WU (Cash)	MG (Online)	MG (Cash)	
Remittance costs (%)	6.93	7.03	2.51	5.17	7.39	7.53	9.73	5.84	
Gain by switching (%)	5.73	5.83	1.3	3.96	3.8	3.94	5.77	1.95	
Gain in 6 months (TOP and %)		1,186,427 TOP (2.5%)				385,819 TOP (2.1%)			1,572,246 TOP (2.4%)

5. DISCUSSION

As per household and economy, we show that Tongan migrants, and the economy as a whole, can significantly benefit from switching RSPs to the lowest-cost one. When policymakers try to change their behavior, what prevents them from switching RSPs? This section attempts to identify potential barriers to switching to lower-cost RSPs based on the existing literature, focusing on the factors at the household level.

We classify the barriers into three stages: awareness, preferences, and capability. Awareness refers to the stage where households do not understand the price advantages of low-cost transfers. Preference is that, after knowing the price advantages, households still choose a higher-cost channel. Capability is that households want to use online transfers or mobile money, but they do not know how to use them.

A lack of awareness of the cost advantage can hinder the expansion of online remittance services and mobile money in Tonga. FSD Africa (2018: 35) mentions that, in the Democratic Republic of Congo, only one respondent had heard of online remittance services. In Kenya, a Western Union user did not know the company offered online services with price incentives, probably because of a lack of promotion by the company (FSD Africa 2018: 35–36). In Tonga, most adults had heard of mobile money in 2016 (NRBT 2017: 24), but we are uncertain whether they also understand the price advantage of online transfers and mobile money. As shown above, less than half of migrants choose remittance channels because of cost advantages. In such a situation, migrants might not compare remittance costs across different RSPs. Thus, they can be unaware of price incentives of online services and mobile money.

The existing evidence reveals that three barriers can lower the preference for online services and mobile money. The first barrier is a lack of digital payment infrastructures. According to FSD Africa (2018: 29–30), households from countries with developed digital payment infrastructures tend to use online transfers, especially mobile money, because of convenience in payments. The same report also mentions that preferences for paying cash over mobile money can hinder the take-up of online services (FSD Africa 2018: 37). In Tonga, the digital payment infrastructure is underdeveloped, and payments are still cash-based. As of 2016, the majority of Tongan workers received income in cash except for government employees, and 98% of households paid school fees and utility bills in cash (NRBT 2017: 12–13). Edwards et al. (2022) report that the main uses of remittances from the participants of temporary migration are paying everyday expenses, school fees, and donating to church. If the payment and donations are cash-based, Tongan households prefer receiving remittances by cash rather than by mobile phone.

The second barrier is trust. This barrier has two dimensions. One is that a closer customer and service relationship gives more assurance and convenience in money transfer services. Households from the Democratic Republic of Congo, Ghana, and Zimbabwe said that cash transfers at the MTO agents were more trustworthy because they knew the staff to whom they should talk to resolve troubles and ask questions (FSD Africa 2018: 37–38). The other is security concerns. In Sierra Leone, people who did not use online services raised concerns about identity theft and fraud (FSD Africa 2018: 39–40). Another study shows that people from the Philippines, India, and Zambia also raised similar security concerns for branchless banking (Cohen 2014: 13–15).

Likewise in the PICs, the existing reports argue that trust is one of the key obstacles to promoting digital financial services and mobile money (Dayrit et al. 2016; Raithatha, Farooq, and Sharma 2021). However, security concern is not a particular problem for online transfers and mobile money in Tonga. Figure 5 shows that few migrants choose remittance channels because of safety, which indicates that security concerns exist for all remittance channels. Yet, human contacts have helped to build trust in services and hence decreased levels of human contacts could hinder the use of online transfers and mobile money.

The third barrier is habit. Changing habitual behavior costs a lot as a respondent from Zimbabwe answered that they kept using cash transfers because *“It is just habit, getting out of the habit would be the biggest thing.”* (FSD Africa 2018: 37). In Tonga, there has been a gradual shift from Western Union to other RSPs, but Western Union remains one of the most popular RSPs because of its ease of use. The Tongan people could also find it difficult to change the habit of remitting money through familiar and user-friendly RSPs, as the Zimbabwean respondent stated.

Capability is the key to building confidence in using mobile money and online transfers. In the Philippines, focused group discussions revealed that people were not willing to use branchless banking and mobile wallets because they did not understand how to use them (Cohen 2014: 16–17). This lack of capability amplifies the fear about new online services and hampers the transition from traditional financial services. Age can be a significant barrier when the older individual who is not technologically savvy plays a major role in household decision-making. In Africa, 9 out of 11 participants aged over 56 used cash transfers partly because of the lack of comfort in using online services (FSD Africa 2018: 40). In Tonga, the household decision is consensus-based, but the relationship within the family members is bounded by tradition, which can give more respect to the decision by elder members (Bennett, Plant, and Boekweg 2017). Thus, households might find it hard to convince the older members to switch from cash transfers to online transfers or mobile money, which leaves households stuck with cash transfers.

6. CONCLUSION

The importance of migration and remittances on economic development is salient in Tonga. This paper examines the issues around remittance costs in the country, focusing on their variation of remittance costs, household behavior around the choice of remittance channels, and the potential gain to be had by switching to the lowest-cost RSPs.

Four main findings illustrate the importance of household choice of remittance channels to lower remittance costs and the potential margin for policy interventions. First, the differences in remittance costs between the lowest- and highest-cost RSPs are significant. The remittance costs of Ria and Ave Pa’anga Pau are more than

20 percentage points lower than the highest-cost RSP in both Australia– and New Zealand–Tonga corridors. Second, the choice of remittance channels leads to high remittance costs. Moneygram and Western Union are popular among Tongan households mainly because of their ease of use. However, these MTOs charge a higher cost than other lower-cost RSPs do.

Third, three household factors emerge as the key to voluntarily shifting from cash transfers to online transfers. Exposure to new information thanks to migration experiences, frequent remittances, and living in Tongatapu have a negative association with the use of cash transfers. Exposure to new information thanks to migration experiences positively relates to the use of online transfers through banks or MTOs. Frequent remittances have a positive association with the probability of using online transfers through MTOs. Living in Tongatapu also has a positive association with the probability of using online transfers through MTOs and mobile money compared to those households living in outer islands, perhaps because of a higher mobile phone ownership and better internet access.

Fourth, the simulation analysis shows that Tongan households and the economy can save a significant amount of money just by switching to the lowest-cost RSP. The cost saved amounts to 1,528,405 Pa'anga which is 2.3% of the total remittances sent by the Tongan temporary migrants. If this higher amount is consumed or invested in the local economy, the multiplier effect could be large.

Such large potential gains should be seen as an existing opportunity for policy interventions to reduce remittance costs, not only for Tonga but also for other PICs. SMP and SP show that migrants from other PICs do not cost more than 5% to send remittances with the lowest-cost RSP. Contemporary recommendation against high remittance in the PICs sheds more light on removing institutional constraints (Raithatha, Farooq, and Sharma 2021). However, the findings indicate that microlevel intervention on household choice of remittance channels and RSPs can potentially greatly reduce remittance costs if policies effectively address critical hurdles, such as awareness of the cost advantages, the ease of use, and consumer trust in remote services.

This research has two limitations. First, the modeling about the choice of remittance channels only includes household characteristics. The first-to-last mile framework suggests that migrants, the characteristics of MTOs, and households in their home countries affect the choice of remittance channels. Due to the data constraints, we cannot include the characteristics of migrants and MTOs to model the choice of remittance channels in Tonga. Second, the result of the simulation analysis would change over time. Popular RSPs change over time as can be seen in the drop in Western Union's popularity and the rise in Ave Pa'anga Pau's popularity. Such competition among RSPs might lead to a reduction in remittance costs.

Moving forward, we have not yet understood why households stick to using high-cost RSPs in Tonga and other PICs. It could be due to lack of awareness of cost advantages, preferences, capability, or a mixture of the three factors. To maximize the benefits of migration with government initiatives, there is an urgent need for researchers and policymakers to collaboratively examine what prevents us from promoting the use of low-cost RSPs in the PICs from both quantitative and qualitative perspectives.

REFERENCES

- Adams, Jr R., and A. Cuecuecha. 2010. The Economic Impact of International Remittances on Poverty and Household Consumption and Investment in Indonesia. doi:[10.1596/1813-9450-5433](https://doi.org/10.1596/1813-9450-5433).
- . 2013. The Impact of Remittances on Investment and Poverty in Ghana. *World Development* 50: 24–40. doi:[10.1016/j.worlddev.2013.04.009](https://doi.org/10.1016/j.worlddev.2013.04.009).
- Amuedo-Dorantes, C., C. Bansak, and S. Pozo. 2005. On the Remitting Patterns of Immigrants: Evidence from Mexican Survey Data. *Economic Review –Federal Reserve Bank of Atlanta* 90(1): 37–58.
- Amuedo-Dorantes, C., and S. Pozo. 2005. On the Use of Differing Money Transmission Methods by Mexican Immigrants. *The International Migration Review* 39(3): 554–576.
- Bailey, R. 2015. Using Material Remittances from Labour Schemes for Social and Economic Development: Case Study Vanuatu. <http://ssgm.bellschool.anu.edu.au/experts-publications/publications/1319/using-material-remittances-labour-schemes-social-and-economic>, doi:[10.25911/5f2007ad7a622](https://doi.org/10.25911/5f2007ad7a622).
- Bedford, C. 2023. New Zealand’s Recognised Seasonal Employer scheme: 38,000 Workers by 2028? *Devpolicy Blog from the Development Policy Centre*. <https://devpolicy.org/nz-recognised-seasonal-employer-scheme-38000-workers-by-2028-20230509/> (accessed 21 July 2023).
- Bedford, C., R. Bedford, and H. Nunns. 2020. *RSE Impact Study: Pacific Stream Report*. Ministry of Business, Innovation and Employment, New Zealand Government, Wellington. <https://www.immigration.govt.nz/documents/statistics/rse-impact-study-pacific-stream-report.pdf> (accessed 21 July 2023).
- Bennett, N. S., H. Plant, and M. Boekweg. 2017. Tongan culture, edited by Bennett, N. S. In *Polynesian Culture*. Orem: Utah Valley University. http://freebooks.uvu.edu/polynesian_culture/05_Tongan_Culture.php (accessed 9 September 2023).
- Bertram, I. G., and R. F. Watters. 1985. The Mirab Economy in South Pacific Microstates. *Pacific Viewpoint* 26(3): 497–519. doi:[10.1111/apv.263002](https://doi.org/10.1111/apv.263002).
- Bouoiyour, J., and A. Miftah. 2016. The Impact of Remittances on Children’s Human Capital Accumulation: Evidence from Morocco. *Journal of International Development* 28(2): 266–280. doi:[10.1002/jid.3147](https://doi.org/10.1002/jid.3147).
- Brown, R. P. C., and E. Jimenez. 2008. Estimating the Net Effects of Migration and Remittances on Poverty and Inequality: Comparison of Fiji and Tonga. *Journal of International Development* 20(4): 547–571. doi:[10.1002/jid.1474](https://doi.org/10.1002/jid.1474).
- Brown, R. P. C., J. Connell, and E.V. Jimenez-Soto. 2014. Migrants’ Remittances, Poverty and Social Protection in the South Pacific: Fiji and Tonga. *Population, Space and Place* 20(5): 434–454. doi:[10.1002/psp.1765](https://doi.org/10.1002/psp.1765).
- Brown, R. P. C., J. Connell, E. V. Jimenez Soto, and G. D. Leeves. 2006. Cents and Sensibility: The Economic Benefits of Remittances. In *At Home and Away: Expanding Job Opportunities for Pacific Islanders through Labour Mobility* (pp. 47–99). Washington, DC: World Bank.

- Cohen, M. 2014. *From Insights to Action: Building Client Trust and Confidence in Branchless Banking*. Microfinance opportunity. Cambridge, Massachusetts. <https://www.findevgateway.org/paper/2014/10/insights-action-building-client-trust-and-confidence-branchless-banking> (accessed 24 June 2023).
- Connell, J., and R. P. C. Brown. 2005. *Remittances in the Pacific: An Overview*. Asian Development Bank. <https://www.adb.org/publications/remittances-pacific-overview> (accessed 19 May 2023).
- Dayrit, M., C., Caparas M. Tobias, M. Abellar, E. Creus, and L. Dunstan. 2016. Digital Financial Services in the Pacific: Experiences and Regulatory Issues. <https://www.adb.org/publications/digital-financial-services-pacific> (accessed 24 June 2023).
- Department of Home Affairs. 2023. Temporary Visa Holders in Australia. Datasets. data.gov.au – beta. <https://data.gov.au/dataset/ds-dga-ab245863-4dea-4661-a334-71ee15937130/details> (accessed 24 June 2023).
- Doan, D., D. Matthew, J. Doyle, and K. Petrou. 2023. Migration and Labor Mobility from Pacific Island Countries. <https://thedocs.worldbank.org/en/doc/511bd7fb799a3379242b5c151b2a14d5-0050062023/original/WRD-Pacific-Islands-case-study-FORMATTED.pdf> (accessed 31 May 2023).
- Edwards, R. 2023. Migration Seems to be Shifting Gender Norms in Tonga. *Devpolicy Blog from the Development Policy Centre*. <https://devpolicy.org/migration-seems-to-be-shifting-gender-norms-in-tonga-20230113/> (accessed 22 July 2023).
- Edwards, R., D. Matthew, D. Doan, and T. Nguyen. 2022. Three Questions on Tongan Remittances. *Devpolicy Blog from the Development Policy Centre*. <https://devpolicy.org/three-questions-on-tongan-remittances-20220720/> (accessed 6 September 2023).
- Fifita, K 'Aseli. 2021. *Remittances Release December 2020*. National Reserve Bank of Tonga, Nuku'alofa. http://reservebank.to/data/documents/Indicators/REM/2020/NRBT_REM_Dec20.pdf (accessed 31 May 2023).
- FSD Africa. 2018. *Moving Money and Mindsets: Increasing Digital Remittances across Africa*. Nairobi: Financial Sector Deepening Africa. <https://fsdafrica.org/publication/moving-money-and-mindsets-increasing-digital-remittances-across-africa/> (accessed 24 June 2023).
- Gibson, J., and D. McKenzie. 2014. The Development Impact of a Best Practice Seasonal Worker Policy. *The Review of Economics and Statistics* 96(2): 229–243.
- Hernandez-Coss, R. 2005. The U.S.–Mexico Remittance Corridor: Lessons on Shifting from Informal to Formal Transfer Systems. doi:[10.1596/0-8213-6087-6](https://doi.org/10.1596/0-8213-6087-6).
- Jayaraman, T. K., C-K. Choong, and R. R. Kumar. 2011. Financial Sector Development and Remittances in Pacific Island Economies: How Do They Help the World's Two Most Recipient-Dependent Countries? *Perspectives on Global Development and Technology* 10(3–4): 386–405. doi:[10.1163/156914911X610376](https://doi.org/10.1163/156914911X610376).
- Jimenez-Soto, E. V., and R. P. C. Brown. 2012. Assessing the Poverty Impacts of Migrants' Remittances Using Propensity Score Matching: The Case of Tonga. *Economic Record* 88(282): 425–439. doi:[10.1111/j.1475-4932.2012.00824.x](https://doi.org/10.1111/j.1475-4932.2012.00824.x).

- Karafolas, S., and G. Konteos. 2010. Choice of Money Transfer Methods in the Case of Albanian Immigrants in Greece. *Transition Studies Review* 16(4): 962–978. doi:[10.1007/s11300-009-0117-7](https://doi.org/10.1007/s11300-009-0117-7).
- Kosse, A. and R. Vermeulen. 2014. Migrants' Choice of Remittance Channel: Do General Payment Habits Play a Role? *World Development* 62: 213–227. doi:[10.1016/j.worlddev.2014.05.002](https://doi.org/10.1016/j.worlddev.2014.05.002).
- MacIsaac, S. 2023. Remittance Modality: Unpacking Canadian Money Transfer Mechanism Choices. *International Migration Review* 01979183231181564. doi:[10.1177/01979183231181564](https://doi.org/10.1177/01979183231181564).
- Maeda, H. and R. Edwards. 2023. Seasonal Work Supports Everyday Expenses in Tonga. *Devpolicy Blog from the Development Policy Centre*. <https://devpolicy.org/seasonal-work-supports-everyday-expenses-in-tonga-20230203/> (accessed 2 August 2023).
- Mansuri, G. 2006. Migration, School Attainment and Child Labor: Evidence from Rural Pakistan. doi:[10.1596/1813-9450-3945](https://doi.org/10.1596/1813-9450-3945).
- Minister's Media Centre. 2023. *Government Delivers on Expanding the Pacific Workforce – Six Months Early*, Ministers' Media Centre. <https://ministers.dewr.gov.au/anthony-albanese/government-delivers-expanding-pacific-workforce-six-months-early> (accessed 21 July 2023).
- Ministry of Business, Innovation and Employment. 2023. Migration Data Explorer. https://mbienz.shinyapps.io/migration_data_explorer/ (accessed 24 June 2023).
- Mobarak, M., I. Sharif, and M. Shrestha. 2020. *Returns to Low-Skilled International Migration: Evidence from the Bangladesh-Malaysia Migration Lottery Program*. Washington, DC: The World Bank. doi:[10.1596/1813-9450-9165](https://doi.org/10.1596/1813-9450-9165).
- NRBT. 2017. *Tonga Financial Services Demand Side Survey*. The National Reserve Bank of Tonga, Nuku'alofa. <http://www.reservebank.to/index.php/financials/financial-access/dss.html> (accessed 24 June 2023).
- PACER Plus. 2023. *Report on Constraints and Opportunities in Remittance Data Collection in the Pacific*. Apia, Samoa: PACER Plus. <https://pacerplus.org/assets/Pacific-Remittance-Data-Constraints-Report-PACER-Plus-v2.pdf> (accessed 24 July 2023).
- Raithatha, R., S. Farooq, and A. Sharma. 2021. *Using Mobile Technology to Improve Remittances to the Pacific*. Global System for Mobile Communications. <https://www.gsma.com/mobilefordevelopment/resources/using-mobile-technology-to-improve-remittances-to-the-pacific/> (accessed 24 June 2023).
- Sharman, E. 2022. New Government Confirms its New Pacific Migration Policies. *Devpolicy Blog from the Development Policy Centre*. <https://devpolicy.org/new-government-confirms-its-new-pacific-migration-policies-20220610/> (accessed 21 July 2023).
- Siegel, M., and M. Lücke. 2013. Migrant Transnationalism and The Choice of Transfer Channels for Remittances: The Case of Moldova. *Global Networks* 13(1): 120–141. doi:[10.1111/glob.12002](https://doi.org/10.1111/glob.12002).
- Tonga Statistics Department. 2022a. *2021 Population and Housing Factsheet*, Tonga Statistics Department, Nuku'alofa. <https://tongastats.gov.to/census-2/population-census-3/census-report-and-factsheet/> (accessed 2 August 2023).

- Tonga Statistics Department 2022b. *Tonga 2021 Census of Population and Housing Volume 1: Basic Tables*, Nuku'alofa, <https://tongastats.gov.to/census-2/population-census-3/census-report-and-factsheet/> (accessed 2 August 2023).
- UNDESA. 2020. International Migrant Stock. <https://www.un.org/development/desa/pd/content/international-migrant-stock> (accessed 21 July 2023).
- United Nations. (n.d.) *Goal 10 | Reduce Inequality Within and Among Countries*. <https://sdgs.un.org/goals/goal10> (accessed 11 July 2023).
- World Bank. 2017a. *Pacific Possible: Long-term Economic Opportunities and Challenges for Pacific Island Countries*. Washington, DC: World Bank. doi:[10.1596/28135](https://doi.org/10.1596/28135).
- . 2017b. *Maximizing the Development Impacts from Temporary Migration*. Washington, DC: World Bank. doi:[10.1596/29622](https://doi.org/10.1596/29622).
- . 2023a. Remittance Prices Worldwide. <https://remittanceprices.worldbank.org/data-download> (accessed 2 August 2023).
- . 2023b. *Remittance Price Worldwide Quarterly Issue 45 March 2023*. Washington, DC: World Bank Group. [https://remittanceprices.worldbank.org/sites/default/files/Remittance Prices Worldwide_main_report_and_annex_q123_final.pdf](https://remittanceprices.worldbank.org/sites/default/files/Remittance%20Prices%20Worldwide_main_report_and_annex_q123_final.pdf) (accessed 11 July 2023).
- . 2023c. *World Development Report 2023: Migrants, Refugees, and Societies*. Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/39696> (accessed 20 May 2023).

APPENDIX 1: ISSUES IN THE PLMS DATA SET

The combined data set of the face-to-face survey and phone-based survey is not yet ready to be used, at least in researching remittance channels and MTOs, due to the following two issues.

First, the information about the main bank or MTO stored in the combined data set is not consistent with the information stored in the initial data set only for the face-to-face survey. In the initial data set, as Tables A2 and A3 present, Moneygram, Western Union, and Ave Pa'anga Pau are the three main MTOs. However, Table A15 in the Appendix shows that ANZ is the most popular remittance service provider while less than 15% of households use Moneygram or Western Union. Also, the table below shows that the two data sets report a different main MTO or bank for the household with the same pairing ID.

w_id	Initial Data	Combined Data
1101205	Western Union	ANZ
1101190	Western Union	ANZ
1101191	Bank of South Pacific	ANZ
1101018	Moneygram	ANZ
1101014	Moneygram	ANZ

Second, the information about the main remittance channel stored in the combined data is not clean. The data must be a categorical variable with five categories, but a simple tabulation shows that it contains many unknown numbers.

10.04. Which Is the Most Usual Channel Through Which Your Household Receives the Money?	Freq.	%
ONLINE TRANSFERS	93	10.15
OVER-THE-COUNTER TRANSFERS	116	12.66
MOBILE WALLET	5	0.55
CASH THROUGH A THIRD PARTY	1	0.11
OTHER (specify)	1	0.11
200	2	0.22
250	1	0.11
300	4	0.44
400	4	0.44
450	2	0.22
500	10	1.09
600	8	0.87
620	1	0.11
700	3	0.33
800	6	0.66
900	5	0.55
1,000	37	4.04
1,200	7	0.76
1,259	1	0.11
1,280	1	0.11

continued on next page

Appendix 1 *table continued*

10.04. Which Is the Most Usual Channel Through Which Your Household Receives the Money?	Freq.	%
1,300	3	0.33
1,390	1	0.11
1,400	3	0.33
1,450	1	0.11
1,500	14	1.53
1,600	1	0.11
1,800	10	1.09
1,950	1	0.11
2,000	38	4.15
2,100	2	0.22
2,400	7	0.76
2,500	15	1.64
2,600	3	0.33
2,700	1	0.11
2,800	4	0.44
3,000	72	7.86
3,300	2	0.22
3,400	1	0.11
3,500	15	1.64
3,600	8	0.87
3,700	2	0.22
3,800	1	0.11
4,000	66	7.21
4,100	1	0.11
4,200	1	0.11
4,400	1	0.11
4,500	10	1.09
4,600	1	0.11
4,800	6	0.66
5,000	53	5.79
5,400	3	0.33
5,500	7	0.76
5,600	2	0.22
5,800	3	0.33
6,000	58	6.33
6,500	6	0.66
6,800	1	0.11
6,900	1	0.11
7,000	23	2.51
7,200	8	0.87
7,500	1	0.11
8,000	16	1.75
8,400	3	0.33
8,600	1	0.11
9,000	4	0.44

continued on next page

Appendix 1 *table continued*

10.04. Which Is the Most Usual Channel Through Which Your Household Receives the Money?	Freq.	%
9,600	4	0.44
9,650	1	0.11
10,000	30	3.28
10,600	1	0.11
11,000	5	0.55
12,000	21	2.29
12,400	1	0.11
13,000	1	0.11
14,000	1	0.11
14,200	1	0.11
14,300	1	0.11
14,400	1	0.11
15,000	17	1.86
16,000	1	0.11
16,800	1	0.11
17,900	1	0.11
18,000	4	0.44
19,000	2	0.22
20,000	9	0.98
21,600	2	0.22
22,000	1	0.11
24,000	3	0.33
25,000	5	0.55
30,000	5	0.55
35,000	3	0.33
40,000	5	0.55
Total	916	100.00

Questions about the Reason Why Temporary Migrants Choose Remittance Channels

The worker survey asks, “Why did you use the main remittance channel?” I modified the label of the variables below when creating the graphs and tables.

Questions in the Survey	Labeling in the Graph
a. Cheapest	Cost
b. Fastest	Speed
c. Easiest to use	Ease of Use
d. Only channels I know of	Awareness
e. Many other work mates use this channel	Word of Mouth
f. Only channel available at home	Available_home
g. Only channel available in your workplace area	Available_host
h. Do not have an account on bank	Bank Account

The Average Remittances in 6 Months Sent by Temporary Migrants

We calculated the average remittances sent by temporary migrants in Australia and New Zealand in the following procedures. The worker survey asked the amount and frequency of remittances: “How often do you send money to your country?” and “Normally, how much did you send to your country each time?” Depending on the frequency of remittances, we multiply the amount of remittances per each time by a constant number to get the estimate of average remittances in six months. For instance, the average remittance in six months is $500 \times 24 = 12,000 \text{ AUD}$, if households send a weekly remittance of 500 AUD. When calculating the average, the migrants who belong to the top 5 percentile are dropped to remove an excessive amount of remittances such that they send 2,000 AUD weekly. This happens because the PLMS allows the workers to report the amount of remittances they sent last time if the amount of remittances varies over time. Table A6 presents the average remittances in six months. The threshold is 24,000 AUD which equals a weekly remittance of 1,000 AUD.

Frequency	A Constant Number (Multiplier)
Weekly	24
Every 2 weeks	12
Once a month	6
Once every 2–3 months	3
Once every 4 months or more	1

APPENDIX 2: SUPPLEMENTAL FIGURES AND TABLES

Table A1: The Main Remittance Channels Reported by Households with Temporary Migrants in Australia or New Zealand

Channel	Freq.	%
Online/Bank	85	16.67
Online/MTOs	193	37.84
Counter/MTOs	198	38.82
Mobile wallet	31	6.08
Other	3	0.59
Total	510	100.00

Table A2: The Main MTOs Reported by Households with Temporary Migrants in Australia

MTOs	Freq.	%
Bank of South Pacific BSP	8	2.22
ANZ	2	0.55
TDB	28	7.76
MBF	1	0.28
Digicel	15	4.16
IMEX Money Transfer	9	2.49
KlickEX	2	0.55
Melie Mei Langi	2	0.55
MoneyGram	196	54.29
Nikua Money Transfer	2	0.55
Pacific Ezy	2	0.55
Western Union	72	19.94
Other	22	6.09
Total	361	100.00

Table A3: The Main MTOs Reported by Households with Temporary Migrants in New Zealand

MTOs	Freq.	%
Bank of South Pacific BSP	1	0.67
TDB	46	30.67
Currency online	1	0.67
Digicel	14	9.33
IMEX Money Transfer	1	0.67
Melie Mei Langi	1	0.67
MoneyGram	50	33.33
Nikua Money Transfer	1	0.67
Pacific Ezy	1	0.67
Western Union	32	21.33
Other	2	1.33
Total	150	100.00

Table A4: The Main MTOs Reported by Temporary Migrants in Australia

Main	Freq.	%
ANZ	11	2.03
Westpac	5	0.92
Western Union	75	13.81
Moneygram	285	52.49
KlickEx	5	0.92
Ria money transfer	11	2.03
Wantok money	2	0.37
TDB	54	9.94
Island Flexi	36	6.63
Other (specify)	59	10.87
Total	543	100.00

Table A5: The Main MTOs Reported by Temporary Migrants in New Zealand

Main	Freq.	%
ANZ	7	3.43
Kiwi bank	2	0.98
BNZ	3	1.47
Westpac	14	6.86
Western Union	31	15.20
Moneygram	25	12.25
KlickEx	9	4.41
KlickEx pacific	1	0.49
Wantok money	1	0.49
TDB	66	32.35
Island Flexi	2	0.98
Other (specify)	43	21.08
Total	204	100.00

Table A6: The Channels Used by Moneygram Users in the Australia–Tonga Corridor

Channel	Freq.	%
Online/MTOs	109	55.61
Counter/MTOs	87	44.39
Total	196	100.00

Table A7: The List of Other (specify) in the Worker Survey

Other (Specify)	
Talafi paanga pe fanga kii talafi ofi ange kanautolu	mobile money
Freedom Pacific	koloa fakatau
Lupe Hume	koloa fakatau facebook
Koloa Fakatau	koloa fakatonga fb page
Talafi paanga Mosimani	mobile money
MOSIMANI	mobile money
pacific eo transfer	no money
Noah	mobile money
Mosimani	mobile money
Koloa Fakatau - Ma'ufanga	Koloa Fakatau
Malakai Huni - Noah	Palu Transfer
world remit	Imex
Mosimani	Mosimani
AMLS money transfer	Mosimani
louena transfer	Mosimani
world money transfer	Rowena
Mosimani Building	BSP
Ria n Noah	MOSIMANI
Mosimani	Kautaha Noa
Rowena money transfer	Mosimasi Money Transfer
Rowena	Mosimani Money Transfer
personal account of a co workers	Koloa Fakatau
manatu ofa	Noah Money Transfer
mobile money digi	Society Federation Money Transfer
mosimani transfer	Rowena Money Transfer
Palu Money Transfer	Noah Money Transfer
Vavau	Palu Money Transfer
Siasi Tonga Houeiki	Rowena money transfer
Tonga Post	private
Mosimani	NOAH
Palu Money Transfer	nasita dvd
Palu	Noah
Melie Mei Langi	Mosimani Money Transfer
Meliemeilangi	Mosimani Money Transfer
Talafi Paaga Siasi STT	Mosimani Money Transfer
Mana	Chinese Shop
post office	Chinese Shop Money Transfer
pangike fakalakalaka	dont know
regional australian bank	koloa fakatonga
Mosimani Building	Koloa Fakatau
pangike fakalakalaka	Koloa Fakatau
mobile money	Koloa Fakatau
online	Koloa Fakatau
doesn't have a fee for the transfer	Koloa Fakatau
online	Koloa Fakatau
Koloa Fakatau	Koloa Fakatau
Noah	Koloa Fakatau
LOUENA FINANCE	Koloa Fakatau
koloa fakatau	Mosimani
mosimani	Koloa Fakatau
mobile money	Mobile Money

Table A8: The Average Remittance Costs Across Different MTOs in the Australia–Tonga Corridor (Send Money Pacific)

MTOs	Mean	Standard Deviation
ANZ	3.471	.300
Ave Pa'anga Pau	2.849	.574
KlickEX	5.086	1.168
Moneygram (Cash)	5.402	.223
Moneygram (Online)	2.639	.227
NAB	23.444	.383
Ria	1.76	.322
Western Union (Cash)	8.231	.379
Western Union (Online)	7.381	.389

Table A9: The Average Remittance Costs Across Different MTOs in the Australia–Tonga Corridor (Saver Pacific)

MTOs	Mean	Standard Deviation
ANZ	3.626	1.018
Ave Pa'anga Pau	2.628	.145
Moneygram (Cash)	5.169	.204
Moneygram (Online)	2.509	.207
OFX	15.727	1.167
Ria	1.209	.345
Wantok	5.549	.13
Western Union (Cash)	7.034	.12
Western Union (Online)	6.934	.12

Table A10: The Average Remittance Costs Across Different MTOs in the New Zealand–Tonga Corridor (Send Money Pacific)

MTOs	Mean	Standard Deviation
ANZ	4.523	.474
ASB	21.676	.494
Ave Pa'anga Pau	3.329	.591
KlickEX	5.411	.742
Moneygram (Cash)	5.843	.295
Moneygram (Online)	9.731	.285
Wantok	5.676	.464
Western Union (Cash)	7.533	.414
Western Union (Online)	7.394	.413

Table A11: The Average Remittance Costs Across Different MTOs in the New Zealand–Tonga Corridor (Saver Pacific)

MTOs	Mean	Standard Deviation
ANZ	5.736	.083
Ave Pa'anga Pau	3.529	.414
Kiwi Bank	15.482	.086
Moneygram (Cash)	5.478	.061
Moneygram (Online)	9.299	.059
Wantok	6.024	.426
Western Union (Cash)	7.467	.12
Western Union (Online)	7.328	.119
iMEX	3.849	.072

Table A12: The Estimated Results of Multinomial Logit Regression

Variables	(1) Online Bank	(2) Online MTOs	(4) Mobile Money
Living in Tongatapu (Yes = 1)	0.517 (0.335)	0.753*** (0.231)	1.768*** (0.573)
Temporary migration status (No migrants is the baseline)			
First-time	0.827** (0.339)	0.312 (0.212)	0.103 (0.415)
Repeated	1.722*** (0.297)	0.490** (0.207)	0.465 (0.367)
Past migration (Yes = 1)	0.264 (0.376)	1.004*** (0.247)	−0.241 (0.473)
Frequency of remittances (On request is the baseline)			
Monthly	0.288 (0.306)	0.463** (0.212)	−0.434 (0.377)
2–6 months	0.508 (0.398)	1.252*** (0.257)	0.939** (0.437)
Monthly remittances (Pa'anga)	−0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Monthly saving per head (Pa'anga)	0.000** (0.000)	−0.000 (0.000)	0.000 (0.000)
Number of adults	−0.044 (0.068)	−0.021 (0.046)	−0.316*** (0.106)
The share of adults who completed the secondary education	0.251 (0.380)	0.239 (0.258)	−0.094 (0.505)
Constant	−3.024*** (0.600)	−2.390*** (0.344)	−2.725*** (0.766)
Observations	941	941	941
Pseudo-R-squared	0.0679	0.0679	0.0679

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A13: The Estimated Average Marginal Effects

	Average Marginal Effects	Standard Error	z	P>z	[95% Conf. Interval]	
Residential place						
Outer islands		(base outcome)				
Tongatapu						
Online Banks	0.015	0.030	0.510	0.613	−0.044	0.074
Online MTOs	0.110	0.041	2.710	0.007	0.030	0.190
Cash MTOs	−0.178	0.046	−3.870	0.000	−0.268	−0.088
Mobile Money	0.052	0.014	3.820	0.000	0.026	0.079
Temporary migration status						
Non-migrants		(base outcome)				
First-time migrants						
Online Banks	0.052	0.026	2.010	0.044	0.001	0.102
Online MTOs	0.042	0.043	0.980	0.329	−0.042	0.125
Cash MTOs	−0.089	0.046	−1.950	0.051	−0.178	0.000
Mobile Money	−0.005	0.020	−0.230	0.819	−0.044	0.035
Repeated migrants						
Online Banks	0.155	0.028	5.430	0.000	0.099	0.211
Online MTOs	0.024	0.040	0.600	0.548	−0.055	0.103
Cash MTOs	−0.182	0.043	−4.270	0.000	−0.265	−0.098
Mobile Money	0.003	0.019	0.140	0.891	−0.035	0.040
Past migration (Yes = 1)						
Online Banks	−0.015	0.035	−0.420	0.674	−0.084	0.055
Online MTOs	0.206	0.047	4.420	0.000	0.115	0.298
Cash MTOs	−0.156	0.051	−3.100	0.002	−0.256	−0.057
Mobile Money	−0.035	0.024	−1.470	0.140	−0.081	0.011
Frequency of remittances						
Monthly or more						
Online Banks	0.015	0.029	0.530	0.599	−0.042	0.072
Online MTOs	0.088	0.038	2.310	0.021	0.013	0.163
Cash MTOs	−0.070	0.042	−1.670	0.096	−0.153	0.012
Mobile Money	−0.033	0.022	−1.470	0.141	−0.077	0.011
2–6 months						
Online Banks	−0.012	0.035	−0.350	0.729	−0.080	0.056
Online MTOs	0.218	0.050	4.350	0.000	0.120	0.316
Cash MTOs	−0.234	0.049	−4.780	0.000	−0.330	−0.138
Mobile Money	0.028	0.033	0.860	0.389	−0.036	0.093
On request		(base outcome)				
Monthly remittances						
Online Banks	−0.000	0.000	−1.350	0.176	−0.000	0.000
Online MTOs	0.000	0.000	1.730	0.083	−0.000	0.000
Cash MTOs	−0.000	0.000	−0.880	0.381	−0.000	0.000
Mobile Money	0.000	0.000	0.660	0.508	−0.000	0.000

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Table A13 *table continued*

	Average Marginal Effects	Standard Error	z	P>z	[95% Conf. Interval]	
Number of adults						
Online Banks	−0.001	0.007	−0.210	0.834	−0.014	0.012
Online MTOs	0.004	0.009	0.420	0.672	−0.014	0.022
Cash MTOs	0.013	0.009	1.410	0.158	−0.005	0.032
Mobile Money	−0.016	0.006	−2.790	0.005	−0.027	−0.005
The share of adults who completed the secondary school						
Online Banks	0.016	0.037	0.430	0.665	−0.057	0.089
Online MTOs	0.042	0.051	0.810	0.415	−0.058	0.142
Cash MTOs	−0.046	0.053	−0.870	0.383	−0.150	0.058
Mobile Money	−0.012	0.025	−0.450	0.650	−0.061	0.038
Saving per head						
Online Banks	0.000	0.000	2.860	0.004	0.000	0.000
Online MTOs	−0.000	0.000	−0.680	0.495	−0.000	0.000
Cash MTOs	−0.000	0.000	−0.080	0.934	−0.000	0.000
Mobile Money	0.000	0.000	0.070	0.943	−0.000	0.000

Table A14: The Average Remittances in Six Months Sent by Temporary Migrants

Country	Observation	Mean	Std. Dev.	Min	Max
Australia	486	8,116.514	5,283.024	0	22,800
New Zealand	184	9,265.283	5,693.992	0	21,600

Table A15: The Main MTOs Reported in the Combined Data

	Freq.	%
NAB	84	9.17
ANZ	619	67.58
ASB	1	0.11
WESTERN UNION	23	2.51
MONEYGRAM	111	12.12
KLICKEX	3	0.33
WANTOK MONEY	3	0.33
TDB	30	3.28
OTHER (Specify)	42	4.59
Total	916	100.00