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Financial Literacy and Remittance Behavior of Skilled and Unskilled Immigrant Groups in Australia[★]

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ABSTRACT

The growing literature on financial literacy suggests people in many countries are poorly prepared for making major financial decisions. One important sub-population rarely examined by financial literacy studies is immigrants, who have specialized financial needs related to remittances. This paper examines variation in financial literacy amongst two actively remitting immigrant groups in Australia – Sri Lankans and Samoans – using surveys designed and supervised by the authors. Paying attention to remittance-related and credit-related literacy, large gaps in the level of financial literacy of the two groups are shown, which are due especially to differences in educational attainment. The wide variation in the transactions costs of various remittance channels available to these two groups suggest that many immigrants could save several hundred dollars per year if improved financial literacy helped to produce more efficient remittance choices.

JEL Classification:

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F24

Keywords:

Financial literacy, Immigrants, Remittances, Transaction Costs, Information, Australia

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1. Introduction

The growing literature on financial literacy suggests that in many countries people are poorly prepared for making major financial decisions (Lusardi and Mitchell, 2006; Yoong, 2011). While most studies use nationally representative samples, or pre-retirement cohorts, a few cover more specialized groups, including convenience samples such as university students (Beal and Delpachitra, 2003). But one important population group that is rarely considered by financial literacy studies is immigrants. Not only are there very few immigrant samples, it is also rare to find immigrant-status used as a predictor variable in studies of the financial literacy of general-purpose samples. For example, Worthington (2006) used a model with 38 predictor variables in a study of financial literacy of Australians, but none of these variables included whether the respondent was an immigrant, despite the high share of immigrants in Australia.

There are at least two reasons why the financial literacy of immigrants may be of special interest. First, many immigrants, especially those who are migrating from poor countries to a rich country, may have low rates of participation in the formal financial sector, either due to language and cultural barriers or because of their limited previous experience of these financial institutions in their home countries. Irregular immigrants, who lack proper documentation, are especially likely to avoid formal financial institutions. Results for a distinctive immigrant group in the US – the Hmong – suggest that it may take nearly a full generation for financial assimilation to occur (Paulson and Rhine, 2008). To the extent that there is learning-by-doing, this lack of financial assimilation also impairs the financial literacy of these unbanked immigrants. A second, less recognized, reason why the financial literacy of immigrants may be distinctive is that they are a group who typically carry out a type of specialized financial transaction that most of the general population does not – sending international remittances.

For many developing countries international remittances have increasingly become a major source of foreign exchange and income. The World Bank estimates US\$325 billion of recorded remittance inflows to developing countries in 2010. These recorded remittances are approximately three times the amount of foreign aid and almost as large as foreign direct investment (FDI) flows to these developing countries (World Bank, 2011). The true scale of remittance flows is likely even larger since remittances through informal channels such as family and friends are generally unrecorded. Since emigrants are now an important source of

external finance for developing countries, it becomes increasingly important that they have good knowledge of the remittance market, in terms of being aware of the range of remittance channels available to them, and understanding the components of remittance costs and how to compare these across various providers. Indeed, the significance of remittance flows to developing countries makes the differences in the level of financial literacy among migrants and the effect of such differences on remittance behavior a key issue worth exploring.

A particular motivation for why the financial literacy of migrants may matter is that it appears that sending international remittances may be one of the most expensive financial activities of consumers, in terms of the relative transactions costs. For example, the transactions costs on remittances sent from Australia and New Zealand to the Pacific Islands range from 15-26 per cent for banks and larger money transfer operators (MTOs) such as Western Union, according to the cost-comparison website developed with World Bank and AusAID assistance (www.sendmoneypacific.org). Except for the highest interest rates for short-term informal credit (e.g., payday loans) it would be rare to find other financial dealings with transactions costs anywhere near as high as this. Moreover, it appears that Australia is an unusually expensive country to send remittances from (Pacific Island Forum Secretariat [PIMS], 2011), since the global average of remittance transactions costs is just nine percent, and is even lower, at approximately four per cent, in some especially competitive corridors.¹ The costs of sending remittances from Australia to the Pacific have long been an outlier when compared to the rest of the world, and lowering the costs of sending remittances is a frequently discussed topic for policy intervention in recent years (AusAID, 2011).

Financial literacy is likely to be a key component of attempts to lower the costs of sending remittances. If remitters could become more effective consumers, who compare remittance products according to their often opaque transactions costs and quickly switch to the cheapest providers, it would put pressure on the uncompetitive providers. Yet the available evidence on the financial literacy of immigrants suggests that they often lack knowledge of the components of a remittance cost, the methods available, or how to compare methods (Gibson et al, 2006; 2007). However, this evidence is from one particular group of immigrants – Pacific Islanders in New Zealand – and may not apply to other immigrants, especially in countries like Australia where skill-selective criteria are used to admit many immigrants.

¹ The cost of sending US\$300 to Mexico fell from US\$32 in 1999 to US\$12 by 2003 (Hernández-Coss, 2005).

The goal of this paper is to examine variation in financial literacy amongst actively remitting immigrant groups in Australia. We also relate financial literacy and its determining characteristics to information-seeking behavior on remittance costs. Since existing general-purpose surveys lack suitable financial literacy questions related to remittances, and have insufficient coverage of immigrants, the paper is based on primary surveys designed and supervised by the authors. Thus the paper does not give a comprehensive picture of all immigrant groups in Australia, instead paying attention to a group of highly skilled immigrants and to a less skilled group who nonetheless are equally active remitters. The level of financial literacy of the two groups is measured, paying attention to remittance-related literacy and credit-related literacy. The financial literacy scores are then subjected to regression decomposition to see which factors have the largest impact on the financial literacy of these immigrant groups, and this reveals the major impact of tertiary education. The determinants of information-seeking behavior on remittance costs are then examined using a probit analysis.

A final contribution of the paper is to consider whether there is scope for financial innovation to lower the transactions costs of remittances. The survey data are used to see how remitters may respond to lower transactions costs since there is uncertainty in the literature about whether lower transactions costs will induce more remittances and what is the distribution of the gains between senders and receivers (Gibson et al, 2006). Although the results are only for two groups of immigrants in one major immigrant receiving country, so little is known about immigrant financial literacy that the results may have broad relevance especially because of the growing attention to the transactions costs of remittances (Gibson et al, 2007).

The rest of the paper is organized as follows. In Section 2 we explain the background and how the surveys are conducted. Section 3 describes and compares the two samples participating in the surveys. Section 4 provides a brief review of the approaches that we used to measure financial literacy. The decomposition methodology and results for examining differences in financial literacy are in Section 5, while the analysis of information-seeking behavior is in Section 6. This is followed by a discussion of the scope for financial innovation in Section 7. Section 8 concludes the paper.

2. Background and Survey

In order to examine the variation in financial literacy amongst actively remitting immigrant groups in Australia we needed to conduct our own surveys. Existing surveys, such as the *ANZ Survey of Adult Financial Literacy in Australia* used by Worthington (2006), lack questions specifically focused on immigrants and related to remittances. We chose two identifiable immigrant populations that differ in terms of education, position in the labor market (and more broadly, in the income distribution), and the stream through which they had immigrated to Australia but which are both known to be active remitters. The first was Sri Lankans, who mainly enter Australia as either skilled migrants or as tertiary students, becoming permanent migrants after completing their studies. The second group was Pacific Islanders, especially Samoans, who mainly enter Australia through family migration, or indirectly by concessional migration to New Zealand with subsequent entry to Australia after obtaining New Zealand permanent residence.² Since Pacific migration is mainly through concessions and family categories these migrants can be expected to have lower formal skills, which is confirmed in the survey data described below. Neither group is especially important in Australian immigration, with Sri Lanka ranking only the 16th and Samoa the 60th most important source country³ (with other Pacific Island countries even lower ranked) for the number of foreign-born in Australia in the 2006 Census. Thus, while our results will show the extent of variation in financial literacy amongst two immigrant groups they may not apply to all immigrants.

Since immigrants are a rare population, especially when considering those from a particular country, obtaining a representative sample can be prohibitively expensive (McKenzie and Mistiaen, 2009). We therefore recruited study participants from these two populations using snowball sampling and intercept point sampling methods. Both of these non-random approaches are feasible and widely used for building a sample when no frame is available.⁴ These approaches also mimic how policymakers and financial institutions might try to reach immigrant groups if, for example, they were targeting financial literacy interventions like disseminating information on new methods of sending remittances.

² The concessions letting a quota of Pacific Islanders be granted New Zealand permanent residence, in addition to those entering under normal immigration arrangements, include the Samoa Quota (1100 per year), and the Pacific Access Category (250 from Tonga and 75 from each of Kiribati and Tuvalu each year). Once these Pacific Islanders obtain New Zealand permanent residence their automatic rights to New Zealand citizenship provide unrestricted entry and residence in Australia under the Trans-Tasman Travel agreement.

³ According to 2006 Census, 0.3% and 0.07% of Australia's total population consisted of Sri Lankan born and Samoan born migrants respectively.

⁴ Including use by Mansoor and Quilin (2007), Bailey (2009), and IOM (2010).

In order to ensure that the surveys were conducted in the most effective and culturally appropriate way individuals from these same populations led the field work, which necessarily put a limit on the geographical scope of each sample. Specifically, the Sri Lankan sample was restricted to the greater Melbourne area while the Pacific Island sample was restricted to the greater Sydney area, reflecting the location of the survey team leaders; in each case these are also the dominant areas where immigrants from each particular population has settled in Australia.⁵

For the Sri Lankan sample, initially 20 people were selected from various Sri Lankan groups in Melbourne, which represented different demographic, economic, educational and location groups. Each individual from these organizations was asked to provide names and contact details of five other Sri Lankan immigrants who could be interviewed; of the 120 potential participants identified this way, 80 on the seed list agreed to participate in the baseline survey. In turn, when the interviews were conducted with these 80 people, they were asked to provide further referrals, leading to another 129 respondents and giving a final sample of $n=209$. For the Pacific Island sample, recruitment was through various Pacific Island churches, located mainly in western and southern Sydney, and also through Pacific Island cultural groups, which drew some respondents from as far away as Wollongong. The remaining participants were recruited from pre-existing research networks of the Samoan team leader (who was based in Sydney), to provide a sample of $n=379$. One feature of the Pacific Island sample is that it included some second-generation migrants. These people are not born in the Pacific but are still likely to be active remitters due to the on-going linkage with the extended families in the Islands (Lee, 2003) and so for this reason we did not rule out any of these New Zealand-born or Australian-born participants. Since there is no research on remittance activity of the second generation Sri Lankan immigrants, the Sri Lankan sample on the other hand was selected with a focus on first generation migrants.

The surveys were fielded in 2011 using largely the same questionnaire that was adapted to the specific nature of each group. Since the Sri Lankan immigrants are a highly skilled group, their questionnaires were printed only in English while for the Pacific Island sample there were both English and Samoan versions available (the number of respondents from locations

⁵ The 2006 census shows Victoria as the most popular destination for Sri Lankan migrants (containing 51% of all Sri Lanka born residents) and New South Wales as the popular state of residence for Samoans (with 45.2% of all Samoan immigrants).

other than Samoa was too small to justify separate translations for each Pacific Island language). The questionnaire collected information on their use and awareness of different remittance methods, their financial literacy, with specific emphasis on knowledge relevant to remittances and use of credit instruments, and their background characteristics. A summary of these characteristics is reported in Table 1. The main differences between the two samples include the much higher educational attainment of the Sri Lankan sample, with higher employment rates, higher incomes, higher home ownership rates and a higher proportion who are male, and who have a parent living overseas.

3. Remittance Behavior and Financial Access

Despite their substantial differences in migration history and position within the Australian labor market, which showed up in the comparison of characteristics in Table 1, the Pacific Islander and Sri Lankan samples reveal similar remittance behavior. In both groups, slightly over one-quarter of respondents sent remittances at least monthly and over one-half sent them at least quarterly (Table 2). The Sri Lankan sample was slightly more likely to include infrequent remitters (the one-quarter who remitted at least annually but not quarterly) while the Pacific Island sample had a higher incidence of never remitting (at least in the previous year). The lower rate of never remitting for the Sri Lankans may reflect the fact that almost all of them were first-generation migrants and a majority still had parent(s) living overseas.

Amongst the respondents who had ever remitted in the previous 12 months, the average value of the last remittance was \$1120 for the Sri Lankans and \$450 for the Pacific Islanders. The median remittances were lower, at \$500 and \$250, since the average reflects a few larger transactions made by members of both groups. These occasional large transactions are likely to be a feature of life for many immigrants, so the best estimate of the annual amount remitted is formed by combining the mean last remittance with data on the frequency of remitting. These estimated annual remittances were just over \$7500 for the Sri Lankans and almost \$4300 for the Pacific Islanders, which is equivalent to 16 per cent and 13 per cent of annual gross income.⁶ In other words, remittances take up a substantial fraction of the income of these immigrant groups.

⁶ The survey also sought to establish the marginal share of income that would be remitted by asking “Suppose that you were to win \$1000 as a lottery prize. How much, if any, would you send as extra remittances?” The marginal share for remittances according to the answers to this hypothetical question was 18 per cent for the Pacific Island sample and seven per cent for the Sri Lankan sample.

The gap in transactions costs between the lowest cost methods of remitting and the highest cost methods is typically at least ten percentage points for a given remittance corridor (Gibson et al, 2007) and the same is true in this setting. For the Sri Lankans, the transactions costs for remitting A\$200 ranged from 16 per cent for a bank transfer to just three per cent for some local money transfer operators (FastCash, Remittance Plus or Serandib). The range was even wider for remitting to the Pacific, with bank transfers costing almost 25 per cent of the amount remitted, for sending \$200, while some MTOs had transactions costs below 10 per cent. Hence, these immigrants may be facing avoidable transactions costs that amount to several hundred dollars per year given the average amount that is remitted.

Despite their potential financial stake in finding and using the lowest cost methods, the surveyed immigrants appear to not have full information about all of the options for remitting. The surveys asked respondents how many different methods of sending money to their usual destination that they knew of, and how many methods they had used in the past year. Even for habitual remitters, an average of only four methods for the Sri Lankans and three methods for the Pacific Islanders were known about, and just two or fewer methods are typically used. This low number of methods identified is despite the questionnaires listing up to ten methods and allowing for open-ended answers where other methods could be written in by the respondent. This finding of incomplete knowledge is consistent with previous studies of remitters, which find that they know about only three other methods, on average, beside their most commonly used method (Gibson et al, 2007).

Another symptom of potentially costly remittance strategies is the frequency of making small remittances, defined here as those that are less than \$100. The structure of transactions costs for almost all remittance providers includes a non-trivial fixed fee, which may be up to \$25, so the percentage transactions cost rises sharply for small remittances. The active remitters amongst the Pacific Islander sample made an average of 1.2 small remittances every three months, which was twice the rate at which the Sri Lankan sample made these small remittances, despite an overall similar frequency of remitting. This propensity to make small remittances, and therefore face higher transactions costs, may reflect lower average incomes in the Pacific sample or differences in awareness about the nature of transactions costs.

The Pacific Island respondents are also less banked, with only three-quarters of them having a bank account (of any type), compared with 95 per cent of the Sri Lankan sample (Table 2).

Similarly, they are much less likely to have a credit card, with a gap of 40 percentage points compared with the Sri Lankans. In addition to the importance of bank account access for financial assimilation, not having a bank account may rule out some cheaper methods of sending remittances. For example, while most remittances to the Pacific are made through cash-based operators like Western Union, one of the cheapest methods of remitting is for the recipient to have a second ATM card linked to a domestic account maintained by the immigrant.⁷ However this low-cost method is not available to any immigrants without bank accounts.

4. Measuring Financial Literacy amongst Migrants

Many approaches are used in the literature to measure financial literacy, but our review of these found few questions particularly designed for migrants or for remittance transactions. Moreover, there is little agreement on how many and what type of questions are needed to measure financial literacy. At the low end of the scale, just three questions related to numeracy, inflation, and diversification are used in the financial literacy measure first developed by Lusardi and Mitchell (2006) for the Health and Retirement Survey (HRS) in the US, and now copied in several general purpose household surveys and financial literacy surveys around the world.⁸ At the detailed end of the scale, in their study of Australian university students Beal and Delpachitra (2003) used 25 questions related to basic concepts (compounding, risk and return and diversification), knowledge of markets and instruments, the use of planning and budgeting, financial analysis and monetary problem solving, and insurance. Yet even with these 25 questions there was nothing of special relevance to migrants, despite their large share in the Australian population.

We therefore developed our own battery of six questions, three that related to remittances and three that related to sources of credit. The reason for the focus on credit is that many studies of immigrants find that they are ‘unbanked’ and therefore have to rely on fringe financial

⁷ In New Zealand the *Financial Transactions Reporting Act* was amended in late 2008 to allow this *Westpac Bank Prepaid Remittance Express Card*, where the second card is sent to the overseas recipient without any identity verification as long as annual remittances sent via the card are limited to less than \$10,000.

⁸ These three questions are as follows: (1) “Suppose you had \$100 in a savings account and the interest rate was two per cent per year. After five years, how much do you think you would have in the account if you left the money to grow: more than \$102, exactly \$102, or less than \$102?” (2) “Imagine that the interest rate on your savings account was one per cent per year and inflation was two per cent per year. After one year, would you be able to buy more than, exactly the same as, or less than today with the money in this account?” (3) Do you think that the following statement is true or false? “Buying a single company stock usually provides a safer return than a stock mutual fund.”

institutions to cash checks and obtain short-term loans (Rhine and Greene, 2006). While it may be that in the long-run, financial literacy related to savings products has the greatest impact on wealth, the short-run financial difficulties from relying on high interest debt are a well known subject of policy interest.⁹ While there is no particular focus on payday lending to immigrant groups in Australia in these policy debates, the typical low-income customers of payday lenders are likely to include unbanked immigrants.

The six questions that we used, and their answer options, are listed in full in Appendix 1. The first remittance question required respondents to identify the cheapest method for sending A\$200 to the destination that they send to (or would send to if they were to begin remitting) from a list of popular providers (which included corridor-specific providers such as indigenous money transfer operators).¹⁰ We had already established which methods were cheapest at the time of the survey and continued to monitor these afterwards and generally the cheapest providers maintained that position for several months so that there was, indeed, a stable correct answer to the question of which provider was cheapest. The next two remittance questions tested whether respondents knew all of the transactions costs components of a remittance and whether they understood the implications of there being fixed, up-front, costs to send money, which makes it cheaper to bundle two smaller remittances into one larger one. The questions on credit asked respondents to identify the type of debt with the lowest interest rate, to identify the repayment strategy that would cause the highest credit card costs, and to correctly calculate the nominal annual percentage rate on a two-week payday loan.¹¹ Only the last question places a particular emphasis on numeracy, all of the others could be answered intuitively even for respondents with low levels of numeracy skills.

On average, the respondents in the Sri Lankan sample gave correct answers for three out of the six questions, while in the Pacific Island sample only one out of six questions was answered correctly (Table 3). In both samples the question on bundling two smaller

⁹ See for example, the reforms to the *National Consumer Credit Protection Act 2009*, proposed by the Minister for Financial Services and Superannuation, Bill Shorten, in September 2011, which would have included capped interest rates and limits on refinancing so that debt on payday loans does not accumulate.

¹⁰ We used a value of \$200 in the questionnaire because previous research with Pacific Island remitters in New Zealand found \$200 to be the median remittance transaction (Gibson et al, 2007). Moreover, \$200 is one of the two exemplar values (along with \$500) used to calculate transactions costs by the remittance comparison website, www.sendmoneypacific.org.

¹¹ No calculations of compound interest are needed for this nominal interest rate question, it simply requires multiplication to convert from a two week period to an annual rate.

remittances into one larger transaction to reduce costs had the highest proportion of correct answers. However the other two questions on remittances were poorly answered, even though the majority of both samples were regular remitters. This finding concurs with evidence reported by Gibson et al (2007) that many remitters only focus on the upfront costs, in terms of the fixed fee to send money internationally, and are ignorant of the exchange rate commission component of the overall transaction cost. Overall, very few of the Pacific Island sample got either of these two remittance questions correct, compared with approximately one-fifth of the Sri Lankan sample.

The questions on credit showed even bigger gaps in knowledge between the Sri Lankan sample and the Pacific Island sample. On average, the credit questions were answered correctly by just 16 per cent of the Pacific Island sample, versus a 53 per cent correct answer rate for the Sri Lankan sample. Moreover, this gap did not just reflect differences in numeracy; all participants struggled with calculating the annual percentage rate for a two-week payday loan, which had the lowest rate of correct answers for credit questions in both samples. Instead, the biggest gap in credit-related financial literacy between the two samples was for a conceptual question on which type of debt (credit card, hire purchase, home mortgage or payday loan) had the lowest interest rate.

5. Accounting for Differences in Financial Literacy

In this section a regression decomposition approach is used to study the gap in financial literacy between the Sri Lankan and Pacific Island samples. The observed difference in average literacy is broken into two parts, that explained by differences in characteristics and a remainder. The decomposition technique that we use is borrowed from the literature on gender and racial differences in earnings where the unexplained remainder is attributed to discrimination (Oaxaca and Ransom, 1994), but in our context the unexplained portion reflects differences in coefficients that may reflect differences in how characteristics are translated into knowledge.

The various decomposition formulae available differ according to the set of coefficients used to value differences in the average characteristics of groups. However, all start with separate regression models, in this case for the financial literacy (L) of Pacific Islanders (PI) and Sri Lankans (SL):

$$\begin{aligned} L^{PI} &= X^{PI} \beta^{PI} + \varepsilon^{PI} \\ L^{SL} &= X^{SL} \beta^{SL} + \varepsilon^{SL} \end{aligned} \quad (1)$$

where:

X^k ($k=PI,SL$) = a matrix of demographic, educational, household, income and employment and financial usage factors that affect financial literacy;

β^k = the vector of regression parameters; and

ε^k = the random error term.

The gap in average financial literacy between the Sri Lankan and Pacific Islander samples can be expressed as:

$$\bar{L}^{SL} - \bar{L}^{PI} = \bar{X}^{SL} \hat{\beta}^{SL} - \bar{X}^{PI} \hat{\beta}^{PI}. \quad (2)$$

In order to decompose this observed gap into a portion due to characteristics and a portion due to coefficients, an estimate of the counterfactual parameter vector, β^* that would apply were there no difference between the samples is needed.¹² By adding and subtracting $\bar{X}^{SL} \beta^*$ and $\bar{X}^{PI} \beta^*$ to equation (2), the decomposition can be expressed as:

$$\bar{L}^{SL} - \bar{L}^{PI} = \bar{X}^{SL} (\hat{\beta}^{SL} - \beta^*) + \bar{X}^{PI} (\beta^* - \hat{\beta}^{PI}) + (\bar{X}^{SL} - \bar{X}^{PI}) \beta^* \quad (3)$$

The first two terms reflect group differences due to coefficients and the last term reflects the portion of the financial literacy gap that is explainable by differences in characteristics.

The crucial issue in implementing equation (3) is the choice of β^* . A flexible way to represent β^* following Oaxaca and Ransom (1994) is given by:

$$\beta^* = \Omega \hat{\beta}^{SL} + (1 - \Omega) \hat{\beta}^{PI} \quad (4)$$

where Ω is a weighting matrix. If it is assumed that Ω is an identity matrix, one obtains the usual Oaxaca decomposition, where the difference in characteristics is valued using the coefficients from the group with the highest value of the outcome measure (in this case, the Sri Lankans, who have the highest average financial literacy). The other widely used assumption is that $\Omega = 0$, with the coefficients from the less successful group used to value the difference in characteristics. However, in the present case there is no reason to favour one set of coefficients over the other, so instead we follow Neumark (1988) who uses a pooling approach, where:

$$\Omega = (X'X)^{-1} (X'^{SL} X^{SL}) \quad (5)$$

¹² In the literature on earnings discrimination, β^* is known as the no-discrimination wage structure.

where X is the matrix of covariates for the pooled sample, and X^{SL} is the matrix for the Sri Lankan sub-sample. This ratio of cross-product matrices can be estimated from a regression of financial literacy on X in the pooled sample, where the dependent variable is fitted financial literacy from the sub-sample regressions in equation (1).¹³

What characteristics are associated with having higher financial literacy, and which differences between the two samples in the average value of these characteristics contribute most to the large gap in financial literacy scores? The results in the first two columns of Table 4 are from bivariate regressions of the financial literacy score for each sample on various characteristics. There are several patterns that are common to the two samples, with greater financial literacy for those with higher education, those with higher income, those who are recent migrants, and those who have a bank account or use e-mail at least weekly (which may proxy for general computer literacy). Financial literacy is also higher amongst the Sri Lankan participants who are male, who have a credit card, who remit at least annually, and who live in smaller households; none of these factors are statistically significant for the Pacific Island sample.

Several of these bivariate correlations disappear once all characteristics are considered at once. Specifically, the third column of Table 4 reports the coefficients of a multiple regression model relating personal, household and financial characteristics to the financial literacy scores for the pooled sample. The t -statistics for the coefficients of this model are in the fourth column.¹⁴ The variables which are statistically significant and positive determinants of financial literacy are having bachelors-level education or greater, which raises the score by 0.75 points, being a recent migrant (0.25 points), using e-mail at least weekly (0.5 points) and having a bank account (0.3 points). There are also significant negative effects on financial literacy of living in a large household, which is here defined as one with five or more members.

¹³ Results will be the same if actual financial literacy is used as the dependent variable, unless sample weights apply (Neumark, 1988, p. 289).

¹⁴ Since the financial literacy score is a count of the number of items that are correct, it only takes on integer values whereas the standard errors for the OLS regression estimator are derived under the assumption of a continuously distributed dependent variable. However, when both Poisson and Negative Binomial regression models were used, which are designed for dealing with count data, the same variables that were statistically significant in the OLS regression remained significant. Moreover, the count-data variant of the regression decomposition (Sinning, et al, 2008) has observed characteristics explaining 80 per cent of the gap in average financial literacy scores between the two samples; almost exactly equal the 78 per cent explained in Table 4. So the additional complications of using count-data models would not alter any inferences from Table 4.

The final two columns of Table 4 present the results of the decomposition, to see which characteristics contribute most to the gap in average financial literacy scores between the Sri Lankan and Pacific Island samples. The raw gap in the average scores is 1.59 points, and 78 per cent of this gap is explained by the characteristics in Table 4 (the explained gap is 1.24 points). The biggest contributor to the explained gap is the difference in the prevalence of tertiary education, with 59 per cent of the Sri Lankan respondents having a bachelor degree or higher, compared with just four per cent of the Pacific Island respondents. Combining this educational gap with the strength of the association between financial literacy and higher education (the pooled regression coefficient of 0.757), shows that this single characteristic contributes 0.4 points to the difference in the average scores, which is one-third of the explained gap. The other large contributors to the explained gap are the frequent use of e-mail (which likely serves as a proxy for computer literacy and access to information sources) and living in large households. On the other hand, differences in experience, in terms of sending remittances at least once per year and in using the banking system (from having either a bank account or a credit card) do not seem to make a very large contribution to the explained gap in financial literacy.

6. Financial Literacy and Remitters' Information-Seeking Behavior

Understanding the information seeking behavior of remitters' is important for the design of policies and interventions that can reduce the cost of remitting. In general, if financial literacy is the major determinant of information seeking behavior of remitters, changing their behavior in the short term will be hard since financial literacy mainly depends on education. Table 5 presents the results of the Probit regression that describes the determinants of information seeking behavior for the pooled sample of remitters. In the first two columns are coefficient estimates and their corresponding t-statistics for a regression model that does not include the financial literacy score. The remaining columns report the results for a regression model that includes the financial literacy variable, to see whether it exerts an effect that is independent of the demographic characteristics, educational attainment and other variables.

The results suggest that there is no independent effect of the financial literacy score on information-seeking. The lack of effect of the financial literacy variable is also apparent from the two regressions having marginal effects for each variable that are very close to each other. Amongst the relevant characteristics, education is the major determinant of information

seeking by remitters, with those with a Bachelors degree being 23 percentage points more likely to seek information, all else the same. A significant difference in information seeking behavior can be seen between the two samples, with the Pacific Islanders having a 22 percent lower likelihood of looking for information on remittance costs. This lower likelihood of seeking information is notwithstanding the fact that sending money from Australia to Pacific Island nations is more expensive than is sending money to Sri Lanka. But since there is no significant impact of financial literacy on information seeking behavior, it would be possible that remitters can be taught to seek information even if they have low literacy. In other words, there is a potential role for specialized training about remittance costs, even amongst groups with low financial literacy (Gibson, McKenzie and Zia, 2013). Such efforts would not necessarily be hampered by the fact that financial literacy depends mainly on levels of education and so is harder to change in the short run.

7. The Scope for Financial Innovation

The evidence on the correlates of financial literacy scores implies that it may be difficult to raise financial literacy in the short-run. While those who have experience of particular financial transactions, such as sending a remittance or using a credit card, have somewhat higher literacy than others, it is having tertiary education rather than learning-by-doing that is the major observable characteristic associated with higher financial literacy. Moreover, studies in other settings suggest that it is these types of cognitive constraints, rather than a lack of attention, that are a key barrier to improving financial knowledge (Carpena et al, 2011). It is therefore an open question as to how much can be achieved by efforts to lower the cost of remittances just by short-term interventions like training programs designed to raise financial literacy. Such efforts may be motivated by a desire to make remittance senders more effective consumers, who can efficiently compare remittance products according to their often opaque transactions costs and who then quickly switch to the cheapest providers, and in the process put pressure on the costly and uncompetitive providers.

However there are other ways that remittance costs can fall, particularly through financial innovation. For example, it is instructive that the average transactions costs of sending money from New Zealand to the Pacific are considerably lower than for transfers to the same region from Australia. According to the Pacific Island Forum Secretariat (2010, p.3) “across all remittance corridors to Pacific Island countries surveyed, the average cost is 21.7 per cent of the amount remitted when sent from Australia and 15.2 per cent when sent from New

Zealand.” At least some of the lower costs for remittances from New Zealand are attributed to a regulatory change that allowed for innovative remittance products (PIFS, 2010, p.4).

Moreover, the entry of non-traditional remittance providers, such as mobile phone operators, also has the promise of substantial reduction in transactions costs. For example, in May 2012 a contactless “beep and go” payment technology was introduced into Tonga by Dicigel, the major Pacific-wide mobile phone company. This lets Tongans use their phones to make payments, and deposit or withdraw cash instantly on their mobiles at local stores. This is the world’s first fully inclusive mass-market mobile payment system that doesn’t require a bank account, smart phone or credit card. The important feature of this mobile wallet is that it can receive international remittances, at rates below those of traditional banks or money transfer operators, without either the sender or the recipient needing a bank account.

It is interesting to speculate on what the response by remitters might be to the potentially lower transactions costs that would follow from financial innovation. On the one hand, if the amount sent is strongly inelastic with regard to the cost of remitting, any reduction in costs passes one-for-one to the sender. This would be the case, for example, if immigrants aim to send a constant amount of the home currency. On the other hand, remitters may share the savings with recipients, so that they increase the amount sent but not by the full amount of the reduced transactions cost. In other words, the overall spending on the remittance by the sender would have fallen. A third possibility is that there is a negative cost-elasticity (Gibson et al, 2006), whereby high transactions costs effectively act as a tax on remittances, so that by lowering the ‘tax rate’ more is spent on making a remittance (and even more is received since the transaction costs are also lower).

To examine these possibilities the survey respondents were asked hypothetical questions about how they would alter their remittances if they were offered a \$10 discount every time they sent money to people in the Pacific Islands (or Sri Lanka) over the next year. The four options given were to send the same amount (so all the cost saving is for the sender), to send \$1-10 more in each remittance (so the saving is shared between receiver and sender), to send more than \$10 more in each transaction, or to transfer less. The modal choice was to transfer the same amount (Table 6), which has the implication that remittances are transactions cost inelastic. But the proportion choosing the “same amount” option was only slightly greater than the proportion choosing to send from \$1-10 more for the Pacific Island sample, and if

both options for sending more are combined then 58 per cent of the Pacific sample (36 per cent for the Sri Lankans) say that would send more money if the transactions costs were lowered. Almost no respondents in either sample said that they would transfer less money. Hence, financial innovation that lowered transactions costs could lead to more money being received in the destination countries, whether from the response of remitters who keep on sending almost the same amount of Australian dollars or from a negative-elasticity response whereby they increase their spending on remittances as the effective taxation rate from high transactions costs begins to fall.

8. Conclusions

In this paper we have examined variation in immigrants' financial literacy, especially related to remittances and sources of credit. In the two immigrant populations studied, spending on remittances is equivalent to more than one-eighth of gross income, on average. In accordance with previous research in the region, we find that there is a wide variation in the transactions costs of sending a remittance from Australia to either Sri Lanka, or especially to the Pacific Islands. This wide variation in transactions costs and the substantial share of income devoted to remittances means that improved financial literacy that resulted in shifting towards lower cost remittance providers could save many immigrants several hundred dollars per year. Yet despite their financial stake in finding and using lower cost methods, the surveyed immigrants appear to have incomplete information on the range of remittance products and imperfect knowledge for calculating the transactions costs of remittances.

We also find a wide variation in financial literacy related to credit, which could cause some immigrants to use very costly credit sources such as payday loans. Some of these gaps in knowledge were due to the Pacific Island immigrants being more likely to be unbanked, and therefore needing to rely on fringe financial institutions. An additional cost of being unbanked is that it rules out some low-cost remittance methods, such as two-card systems that use ATMs for the recipients to get their cash. This additional cost of being unbanked may be reduced in the future with the continued development of mobile wallets as companies providing mobile telephone services combine with financial service operators to provide low-cost remittance methods that do not require bank accounts in either source or destination countries.

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Appendix 1: Financial Literacy Questions (version for the Pacific Island survey)

Remittance-specific measures:

In your opinion, which of the following methods is the cheapest way of sending A\$200 to someone in the Pacific Islands?

- a) Western Union
- b) Bank transfer
- c) Samoa Money Transfer
- d) ATM card or Visa prepaid card
- e) Other (specify) _____

When money is sent by someone in Australia to people in the Pacific Islands, what are the various costs that the bank or money transfer operator charges? (tick all that apply)

- a) A fixed fee imposed on the sender
- b) A fixed fee imposed on the recipient
- c) An exchange rate commission
- d) All of the above
- e) None of the above
- f) Don't know

Suppose you want to send A\$200 to the Pacific Islands. Which costs more, sending it all at once as \$200, sending it at two different times of \$100 each time, or is the cost the same either way?

- a) Cheapest to send \$200 all at once
- b) Cheapest to send \$100 two times
- c) The same cost either way
- d) I don't know

General Financial Literacy:

In your opinion, which one of the following credit card users is likely to pay the GREATEST dollar amount in finance charges per year, if they all charge the same amount per year on their cards?

- a) Semisi, who pays at least the minimum amount each month, and more when he has the money
- b) Samisoni, who only pays the minimum amount each month
- c) Sione, who always pays off his credit card in full shortly after he receives it
- d) Tevita, who generally pays off his credit card in full, but occasionally, will pay the minimum when he is short of cash.

In your opinion, which type of loan will generally have the LOWEST interest rate?

- a) Credit card
- b) Hire purchase
- c) Home mortgage
- d) Payday loan

A consumer takes out a payday loan for \$100 which has a \$15 fee. After 2 weeks, the consumer pays back the full \$115. What do you think is the annual percentage rate (APR) charged on this loan?

- a) 15%
- b) 115%
- c) 315%
- d) 390%

Table 1: Personal and household characteristics of survey respondents

	Sri Lankan Sample	Pacific Island Sample
Age	39.739 (0.666)	34.830 (0.711)
Male (=1, female=0)	0.699 (0.032)	0.417 (0.025)
Education of Grade 10 or less	0.014 (0.008)	0.293 (0.023)
Education of Bachelors or more	0.589 (0.034)	0.042 (0.010)
Married (=1, else=0)	0.880 (0.023)	0.544 (0.026)
First generation migrant	0.986 (0.008)	0.778 (0.021)
Migrated to Australia within last 10 years	0.622 (0.034)	0.361 (0.025)
Has parent(s) living overseas	0.766 (0.029)	0.311 (0.024)
Employed full-time	0.641 (0.033)	0.496 (0.026)
Employed part-time	0.144 (0.024)	0.095 (0.015)
Annual income (A\$)	46599 (1765)	32461 (788)
Household has 5 or more members	0.029 (0.012)	0.596 (0.025)
Dwelling is rented (=1, else=0)	0.340 (0.033)	0.744 (0.022)
Uses e-mail at least weekly (=1, else=0)	0.761 (0.030)	0.435 (0.026)
Number of observations	209	379

Notes: Mean values. Standard errors in ().

Table 2: Remittance activity and financial access

	Sri Lankan Sample	Pacific Island Sample
Sends remittances at least monthly	0.280 (0.032)	0.303 (0.024)
Sends remittances at least quarterly	0.570 (0.035)	0.584 (0.026)
Sends remittances at least annually	0.815 (0.028)	0.714 (0.024)
Receives remittances	0.315 (0.033)	0.024 (0.008)
Has a bank account (ATM, savings or cheque)	0.950 (0.015)	0.768 (0.022)
Has a credit card	0.755 (0.030)	0.351 (0.025)
<i>Conditional on ever remitting, last 12 months</i>		
Number of remittance methods known about	3.981 (0.163)	3.076 (0.118)
Number of remittance methods used ^a	1.623 (0.072)	2.045 (0.086)
Last remittance value (AU\$) ^a	1120 (272)	450 (63)
Annual amount remitted (AU\$)	7564 (2566)	4261 (675)
Number of remittances of less than A\$100 ^b	0.593 (0.081)	1.163 (0.112)

Notes: Standard errors in (), $n=588$.

^a In the last 12 months.

^b In the last three months.

Table 3: Financial literacy components and financial literacy scores

	Sri Lankan Sample	Pacific Island Sample
Knows cheapest method(s) to remit \$200	0.278 (0.031)	0.034 (0.009)
Knows all components of a remittance fee	0.191 (0.027)	0.037 (0.010)
Knows that bundling reduces remittance fees	0.780 (0.028)	0.720 (0.023)
Knows minimum payments raise credit card costs	0.440 (0.034)	0.285 (0.023)
Knows which debt has lowest interest rate	0.742 (0.030)	0.129 (0.017)
Correctly calculated APR on payday loan	0.416 (0.034)	0.050 (0.011)
<i>Financial Literacy Score (sum of correct answers)</i>		
Mean	2.847 (0.103)	1.256 (0.041)
Median	3	1

Notes: Standard errors in (), $n=588$. The questions and answer choices for each financial literacy component are listed in Appendix 1.

Table 4: Determinants of financial literacy scores and contribution of observed characteristics to the average gap in literacy scores between the two migrant groups

	Bivariate regressions		Pooled regression		Decomposition	
	Sri Lankan	Pacific	Coeff	t-stat	of average gap	
Age	-0.006	0.001	0.001	(0.30)	0.007	0.6%
Male (=1, female=0)	0.781***	0.039	0.201	(1.68)	0.057	4.6%
Education of Grade 10 or less	-1.874**	-0.184**	-0.147	(1.14)	0.041	3.3%
Education of Bachelors or more	0.945***	0.451**	0.757	(4.49)	0.414	33.5%
Married (=1, else=0)	-0.174	0.141*	0.213	(1.72)	0.072	5.8%
First generation migrant	0.521	0.145	0.164	(1.06)	0.034	2.7%
Migrated to Australia within last 10 years	0.588***	0.216**	0.258	(2.49)	0.067	5.4%
Employed full-time	0.759***	0.115	-0.186	(0.62)	-0.027	-2.2%
Employed part-time	-0.133	-0.191	-0.124	(0.71)	-0.006	-0.5%
Annual income (A\$000)	0.020***	0.005*	0.007	(0.80)	0.095	7.7%
Household has 5 or more members	-1.387**	0.067	-0.272	(2.65)	0.155	12.5%
Dwelling is rented (=1, else=0)	0.168	0.081	-0.141	(1.37)	0.057	4.6%
Uses e-mail at least weekly (=1, else=0)	1.350***	0.191**	0.503	(4.69)	0.164	13.3%
Sends remittances at least annually	1.044***	-0.108	0.036	(0.33)	0.003	0.2%
Has a bank account	1.797***	0.286***	0.306	(2.44)	0.046	3.7%
Has a credit card	1.174***	0.028	0.152	(1.42)	0.058	4.7%
Intercept			0.540	(2.36)		
Total explained gap in literacy score					1.237	100.0%

Notes: The bivariate regressions have $n=209$ for the Sri Lankan sample and $n=379$ for the Pacific Island sample. Linear regression coefficients are reported, which show the increase in the financial literacy score for a one-unit change in the characteristic. Statistical significance is denoted as: ***=0.01, **=0.05 and *=0.10.

For the pooled regression, $n=588$, $R^2=0.385$, $F_{(16, 571)}=22.35$ ($p<0.001$).

Table 5: Determinants of Seeking Information on Remittance Costs

	Excl. Literacy Score		Incl. Literacy Score	
	Coeff	t-stat	Coeff	t-stat
Age	0.007***	(2.69)	0.007***	(2.70)
Male (=1, female=0)	0.104	(1.41)	0.103	(1.41)
Education of Grade 10 or less	0.079	(1.00)	0.078	(0.99)
Education of Bachelors or more	0.231**	(2.17)	0.226**	(2.12)
Married (=1, female=0)	-0.022	(0.31)	-0.023	(0.32)
First generation migrant	0.035	(0.36)	0.030	(0.30)
Migrated to Australia within 10 yrs	-0.113*	(1.94)	-0.115**	(1.97)
Employed full-time	0.219	(1.21)	0.223	(1.23)
Employed part-time	0.076	(0.71)	0.079	(0.74)
Annual income (A\$000)	-0.009*	(1.67)	-0.009*	(1.70)
Household has 5 or more members	0.057	(0.89)	0.058	(0.90)
Dwelling is rented (=1, else=0)	0.024	(0.40)	0.024	(0.40)
Uses e-mail at least weekly	0.083	(1.31)	0.078	(1.22)
Has a bank account	-0.132*	(1.73)	-0.134*	(1.75)
Has a credit card	-0.023	(0.38)	-0.024	(0.39)
Pacific Island sample	-0.234***	(2.65)	-0.215**	(2.30)
Financial literacy score (0-6)			0.016	(0.66)
Likelihood ratio test (slopes=0)	$\chi^2_{(16)}=48.13***$		$\chi^2_{(17)}=48.57***$	

Notes: Marginal effects from probit regressions reported, showing change in probability of seeking information for a one unit change in the independent variable. The sample is restricted to those ever sending remittances ($n=434$).

Statistical significance is denoted as: ***=0.01, **=0.05 and *=0.10.

Table 6: Responses to hypothetical questions on lowering the costs of money transfers

	Sri Lankan Sample	Pacific Island Sample
Transfer the same amount, keeping the discount for self	59.8	35.1
Transfer \$1-10 more than would normally remit	15.2	32.9
Transfer more than \$10 more than normally remit	21.2	25.1
Transfer less than would normally remit	3.8	6.9

Notes: