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Negative shocks travel home: the income elasticity of temporary migrant remittances

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Abstract

Using high-frequency financial diaries from Fijian temporary migrant workers in Australia and their families back home, we estimate the within-individual income elasticity of remittances at approximately 0.3 and a marginal propensity to consume remittance income at around 0.7. Migrants send regular, stable amounts home, regardless of their earnings level: remittance budget shares fall with income in our sample, resembling Engel's Law. Exploiting fortnightly variation within individuals, we find that the contemporaneous elasticity is driven by negative shocks, while positive shocks are absorbed with higher consumption or savings abroad. The immediate pass-through of earnings declines to families, for whom remittances are typically the primary and often only source of income, has direct implications for worker welfare protections and the vulnerability of remittance-receiving households.

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1. Introduction

How low-income households manage income volatility, unexpected expenses, and other risks is a topic central to modern development economics (Dercon 2002). How do these risks change when your primary source of income is remittances from a family member temporarily working overseas? Low-income workers in advanced economies face significant earnings volatility (Ganong et al. 2025) and migrants commonly work in these sectors and occupations. Are shocks borne by migrant workers passed through to their families back home or absorbed by the migrant? These first-order questions for understanding how migration affects development have proven difficult to study, as we rarely observe migrants or their households repeatedly, let alone simultaneously, as they weather the ebbs and flows of their working weeks abroad (Bossavie and Özden 2023). In this paper, we provide direct evidence on the income elasticity of remittances with respect to the earnings fluctuations of individual migrant workers, and how this variability affects household expenditures back home. These questions are not unique to international migration, as rural-to-urban migrants within developing countries face similar spatial separation, income pooling, and risk-sharing issues (Lucas and Stark 1985; Rosenzweig and Stark 1989) and the underlying economics relate to long-standing questions on how households allocate resources, share risk, and manage information asymmetries (Riley 2024; Carranza et al. 2025). From the household's perspective, the national border is simply an additional source of frictions (e.g., transfer costs, time zones, information asymmetries amplified by distance) rather than a fundamentally different decision environment.

The main barrier to understanding the day-to-day "financial lives" of migrant workers and their households back home is data. We address this challenge by simultaneously collecting detailed high-frequency financial diaries of temporary Fijian migrants working in Australia under the Pacific Australia Labour Mobility (PALM) scheme and their families back home in Fiji, covering all transactions and accounts, regardless of the financial services provider, every week for up to a year.[1] The high-frequency longitudinal nature of

[1]While our sample of 29 workers and their families back home is objectively small in cross-sectional terms, detailed case study evidence from novel data and rich fieldwork, sacrificing cross-sectional breadth for

this data, which reveals considerable volatility within most individual time series, provides a unique opportunity to study how remittances vary with earnings abroad, an issue which clearly transcends this established and important corridor. Paired migrants' household incomes are almost entirely comprised of remittances and household finances in Fiji are far more volatile than those of their family members abroad, rendering this a first-order welfare issue for remittance-receiving households.

A second challenge is disentangling the effects of income on remittances sent and on remittance-receiving households, likely heavily confounded if migrants adjust their work on the margin to meet anticipated or realised remittance demands from back home. Here, Australia's PALM scheme and our dyadic data offer distinct advantages for identification. They also offer advantages relative to much of the intrahousehold bargaining literature, where it has proven difficult to credibly exclude dynamic effort adjustments between household members in response to each other's earnings. As PALM workers are employed at minimum wages or modern industry awards, pay rates do not vary by period unless their roles significantly change. Variation in fortnightly earnings within individuals is thus almost entirely due to employer-determined variation in rostered hours (i.e., fluctuations in processing demand and shift allocations). Several falsification tests suggest that income variation is demand-driven by employers, rather than supply-driven by workers' remittance needs. We exploit this plausibly exogenous variation in earnings within individuals using a simple within fixed effects approach, estimating the income elasticity of remittances and other expenditures with respect to deviations from each migrant's average earnings. We then take advantage of the dyadic nature of the data and the fact that receiving households cannot determine worker hours in Australia to recover the marginal propensity to consume remittance income in Fiji. To understand what drives these elasticities and the pass-through of migrant income risk to families back home, we explore asymmetric responses to positive versus negative earnings shocks.

Our main result: within individuals, the income elasticity of remittances is around 0.3. A one percent increase in earnings corresponds to between a 0.26 percent (using

individual depth, now has a long and rich tradition in development economics (Collins et al. 2009; Banerjee and Duflo 2007; Townsend 2016). We build on and extend this tradition to the transnational household here.

fortnightly data) and 0.34 percent (using monthly data) increase in remittances in the same period. These within-individual elasticities sit against the cross-sectional variation: regardless of whether PALM migrants earn more or less in Australia over their stay, they tend to send similar *regular* amounts home in level terms. Thus, regular remittances follow a type of Engel's Law, falling as a share of income as income rises. As the gap for higher earners, by definition, is consumed abroad or saved for lumpier transfers or carried back for expenditures upon return, such an Engel's Law for regular remittances does not preclude higher-income migrants accumulating more savings and thus ultimately taking or sending more money home beyond their regular transfers. Our data are consistent with this interpretation. Taking the averages across fortnights for each worker, the average worker typically earns $1,968 per fortnight, sends $458 back home, spends $574 on other expenses, and has $935 left over in savings.

Exploiting the dual-sided nature of our data and the fact that employer rostering decisions in Australia are plausibly exogenous to household expenditures in Fiji, we estimate a marginal propensity to consume remittance income in Fiji at around 0.7, slightly below the marginal propensity to consume any income of 0.8. The average fortnightly income observed in our dataset in Fiji is 633 FJD, where 566 FJD is remittance income from the migrant in Australia, and 444 FJD is reported in expenses. Thus, consuming most of their income each fortnight, which is mostly from remittances, remittance-receiving households have less of a savings buffer, an average of 189 FJD per fortnight, to weather shocks and uncertainty independent of the migrant family member.

These contemporaneous remittance and expenditure responses are marked by important asymmetry. Immediate remittance responses appear primarily driven by negative (i.e., earnings below each migrant's median) rather than positive shocks, suggesting immediate pass-through of negative income shocks to families back in Fiji while positive shocks tend to be consumed abroad, saved, or sent later. This pattern is consistent with recent work on intrahousehold bargaining in Sub-Saharan Africa, where variation in earnings visibility (i.e., women's ability to hide income) affects within-household transfers and consumption allocations (Riley 2024; Field et al. 2021; Heath and Riley 2024). In contrast,

worker expenditures increase significantly when they have higher pay periods but we find no evidence that these gains are immediately passed on to families back home, consistent with models of private asymmetric information (de Laat 2014; Joseph, Nyarko, and Wang 2018). Migrant expenditure responses to negative shocks are more muted, suggesting some degree of consumption smoothing while overseas. This asymmetry means that the lower-income household in Fiji is absorbing the downside earnings risk of the higher-income migrant in Australia, and that measures in place to protect workers from negative income shocks, including minimum hours and pay guarantees, may be more important for workers' families back home than for the workers themselves.[2]

1.1. Relative contributions

This paper connects three main streams of research in economics. The first lies at the intersection of migration and development, and in particular the microeconomics of how shocks experienced by migrants abroad transmit back to families and local economies in origin countries. In the burgeoning literature on how migration affects development in migrant sending countries (Yang 2011; Clemens 2011; Dustmann and Görlach 2016), remittances play a central role in shaping development outcomes (Lucas and Stark 1985; Adams and Page 2005; Acosta et al. 2008). Most of what we know about the transmission of shocks through remittances comes from aggregate-level analyses focused on extensive (changes in employment opportunities) rather than intensive margin adjustments made by individual migrants (what they actually do with their money) while overseas.[3] Household-level studies on remittance behaviour, including a large literature on rural-urban migration within developing countries (Lucas and Stark 1985; Rosenzweig and Stark 1989; de la Brière et al. 2002) in addition to international flows, directly examine the decision environment but tend to be limited by cross-sectional variation or one-off experimental interventions,

[2] As the consumption floor for Pacific households is relatively high in a global context, this somewhat tempers the welfare implications compared to other settings with lower incomes and higher poverty, such as rural Sub-Saharan Africa, where much of this literature has focused to date.

[3] Caballero, Cadena, and Kovak (2023) show how labour demand shocks in the United States transmit back to local economies in Mexico, while Yang (2008) exploits the Asian financial crisis to show that exchange rate shocks affect remittance flows and investment in origin communities in the Philippines.

not observing within-individual dynamics over time.[4]

The closest study to ours is Joseph, Nyarko, and Wang (2018), which uses administrative data from a financial institution to directly observe remittances and unpack migrants' responses to income shocks in the United Arab Emirates. They find that remittances are more elastic when shocks are observable to recipients, consistent with a model of asymmetric information in decision-making. Simpson and Sparber (2020) estimate income-remittance elasticities of similar magnitude using household-level data in the United States. Like Joseph, Nyarko, and Wang (2018), we estimate within-individual income elasticities of remittances and explore asymmetric responses. Unlike that study, we select on the migrant rather than the financial institution, capturing all transactions across all accounts rather than those visible to a single provider. Observing both sides of the transnational household, we trace shocks from sender earnings, through remittances, to receiver expenditure, and estimate the marginal propensity to consume remittance income, something not possible when only one side is observed. In this way, our data structure arguably parallels the ideal setting in the intrahousehold bargaining literature, where observing both members' income, transfers, and expenditures simultaneously is key for identifying allocation rules and risk-sharing arrangements.

This paper also contributes to work in household finance on the consequences of income volatility for low-income households, the allocation of risk within families, and the extent to which households smooth consumption in the face of income shocks (Townsend 1994; Dercon 2002; Morduch 1995; Udry 1994, 1995; Yang and Choi 2007; Jack and Suri 2014; Gröger and Zylberberg 2016). As Morduch and Schneider (2017) first demonstrated in a small sample and Ganong et al. (2025) later validated with a representative sample, the majority of US workers experience substantial earnings volatility, even in ongoing employment relationships, with consequences for consumption and welfare (Schneider and Harknett 2019). We add to this work a unique but globally ubiquitous case where the

[4]These studies include those on asymmetric information between migrants and recipients (Ashraf et al. 2015; Seshan and Yang 2014), split decision-making within transnational households (Clemens and Tiongson 2017; Seshan and Zubrickas 2017), and the role of commitment devices and other financial products in shaping how much, how often, and how migrants send home (De Arcangelis et al. 2015; Batista and Narciso 2018; Ambler 2015).

low-income worker with volatile earnings is separated from their family by significant distance, either international borders or long-range rural-to-urban migration (e.g., South Asia), and welfare must be considered from both sides.[5] The within-individual income elasticity of remittances we estimate is smaller than the corresponding elasticity of migrant consumption abroad. This sits alongside an important cross-sectional regularity: regardless of whether migrants earn more or less over their stay, they send the same regular amounts home, so that remittance budget shares fall with income in a pattern resembling Engel's Law. This average masks an important asymmetry, as negative income shocks are passed through immediately to families back home while positive shocks are absorbed. For remittance-receiving households, where remittances typically constitute the primary and often only source of income, the immediate pass-through of negative shocks means that earnings volatility abroad directly determines consumption volatility at home, which we quantify directly with our dyadic data. While the classic literature on the marginal propensity to consume transitory income (Friedman 1957; Jappelli and Pistaferri 2010) has been extended to transfers and windfall income (Parker et al. 2013; Kaplan, Violante, and Weidner 2014; Kaplan and Violante 2014; Ganong et al. 2024) as well as to unconditional cash transfers (Haushofer and Shapiro 2016; Egger et al. 2022), we estimate this quantity for remittance income identified through the earnings shocks of a specific sender observed in real time. In this regard, our dual-sided data complement experimental and quasi-experimental studies in the household decision-making literature (Clemens and Tiongson 2017; Seshan and Zubrickas 2017).

Our third main contribution is at the intersection of measuring remittances and Pacific migration and development. Remittances are difficult to measure (De Arcangelis et al. 2023; McKenzie and Mistiaen 2009) and standard approaches, typically household surveys with long recall periods or administrative data from individual financial institutions, miss important dimensions. Comola and Fafchamps (2014) and Gibson and McKenzie (2017)

[5] A related question is whether risk-sharing operates in both directions: whether migrants provide additional insurance to the Fijian household for shocks originating in Fiji. Our data and empirical setting do not provide a clear and systematic test of this, though the transaction notes include ad hoc transfers specifically responding to such requests from back home.

show that remittance reports can diverge substantially depending on who reports, how often transfers occur, and the recall burden placed on respondents. The financial diaries methodology we use (Collins et al. 2009; Morduch and Schneider 2017) collects transaction-level data every week across all accounts and providers from both migrants and their families, addressing recall error and provider selection issues. The positive economic impacts of Pacific labour mobility schemes have been well-documented (Gibson and McKenzie 2014; Bank 2017) and the crucial issue is how to increase their development impacts further (McKenzie and Yang 2015). Evidence on remittance behaviour in these corridors tends to come from cross-sectional surveys (Doan, Dornan, and Edwards 2023; Edwards, Maeda, and Suryadarma 2024) and much older studies (Brown 1997; Gibson et al. 2006), since which the remittance technology has changed considerably.[6] Our data come from Australia's PALM scheme: one of the few temporary migration programs in the world with an explicit development objective and among the most regulated. The high-frequency longitudinal structure allows us to examine within-individual dynamics and intensive margin adjustments that are simply not visible in cross-sectional data.

1.2. Roadmap

The next section introduces Australia's PALM scheme and the institutional settings that guide our analysis. Section 3 introduces our dual-sided financial diaries data and presents descriptive statistics on PALM migrant earnings and remittances. Section 4 details our estimation and identification strategies. Section 5 presents the results on within-worker income elasticities of remittances and the marginal propensity to consume remittance income back in Fiji. Section 6 explores the asymmetric transmission of income shocks in Australia back to households in Fiji and Section 7 concludes.

[6] For PALM workers and increasingly for migrants globally, transfers are increasingly instantaneous or close to it through electronic platforms, and employers sometimes split pay between domestic and overseas bank accounts at the worker's request, bringing these mechanics closer than before to that of income allocation within a domestic household.

2. Background

2.1. Institutional details on the PALM scheme

Our focus is on Fijian temporary migrant workers in Australia as part of the Pacific Australia Labour Mobility (PALM) scheme's "long" stream, introduced in 2019 as the Pacific Labour Scheme (PLS). The PALM scheme's purpose is to "(a) support the economic development of Pacific countries and Timor-Leste, (b) help workers build skills and experience, and (c) help meet workforce shortages in rural and regional Australia." It brings in people from ten countries and has, at least since 2019, explicitly been a central part of Australia's foreign aid and development program (Department of Foreign Affairs and Trade 2025).[7] With over 30,000 workers in Australia in January 2026, the PALM scheme is firmly established as a stable and important circular labour migration corridor for many Pacific countries where migration is remarkably important, remittances as a share of GDP are among the highest in the world, and domestic demand and employment opportunities are limited (Doan, Dornan, and Edwards 2023). Yet, with media reports documenting incidents of low pay, accidents, and people breaching their visa conditions to leave the scheme, the PALM scheme remains contested in both academic and public discourse (Petrou and Connell 2023; Withers 2024; Withers and Liu 2026).

The PALM scheme is a highly regulated and demand-driven program, which consolidated Australia's Seasonal Worker Programme (SWP, in place since 2012, now the PALM-short stream) and Pacific Labour Scheme (PLS, since 2019, now the PALM-long stream) in 2022 (Department of Employment and Workplace Relations 2026a; Gibson and McKenzie 2011). The SWP was modelled on New Zealand's Recognised Seasonal Employer (RSE) scheme, bringing Pacific workers over for several months a year to work in highly seasonal sectors, typically horticulture and under casual labourer rates (Gibson and McKenzie 2014; Howes 2026). The PLS offered a significant departure from the SWP in Australia and the RSE scheme in New Zealand, aiming to offer longer contracts of up to

[7] To our knowledge, PALM's explicit development focus and the close involvement of Australia's foreign aid agency in this temporary labour migration program are unique globally in the migration and development policy landscape.

four years, broaden the range of sectors beyond seasonal agriculture and tourism, offer more opportunities to women, and offer some roles with slightly higher skill requirements, for example in aged care (Chand, Clemens, and Dempster 2022; Clemens and Chand 2023). In practice, it is dominated by men working in meat processing, typically abattoirs, at the minimum wage unless doing higher-skill tasks (e.g., dicing, boning, supervising). Workers in both schemes are usually placed in regional (i.e., rural) Australia, with the exception of those in meat processing where postcode restrictions were lifted (Department of Employment and Workplace Relations 2026b). Thus, many PALM-long workers live on the outskirts of capital cities, while those on the short visas are predominantly in rural agricultural areas (Nguyen and Edwards 2025).

2.2. Fijian participation in the PALM scheme

Fiji has participated in the PALM scheme since it joined its predecessor the SWP in 2015, three years after its launch. In 2019, however, there were just 226 Fijian workers in Australia under the scheme, but this had grown to 5,350 in September 2025 (Department of Employment and Workplace Relations 2026b). Despite their proximity, the number of people of Pacific origin living in Australia is small, primarily due to the country's largely skills-based immigration system (Howes and Liu 2022). Most Pacific people in Australia came through New Zealand, with the exception of Indo-Fijians who have been competitive for skilled visas and driven to leave under discriminatory policies following the 1987 coup (Chand and Clemens 2023; Curtain et al. 2022). The PALM scheme thus is the primary pathway for Fijians ineligible for skilled pathways to work in Australia (with the exception of the new Pacific Engagement Visa, which offers permanent visas for up to 300 Fijians per year through a lottery), and most Fijian PALM participants are indigenous Fijian (i-Taukei). The waitlist or work-ready pool had been closed for a number of years and just opened again in August 2025, with at least 20,000 applications waiting to be processed (Turner 2025). Despite the popularity of the schemes among potential workers, concerns over a so-called brain drain, the loss of domestic workforce, and an over-reliance on remittances remain widespread (Macdonald, Heap, and Joyce 2025; Prasad 2026).

3. Dual-sided financial diaries data

3.1. The Remittance Diaries project

Household financial diaries have been crucial for understanding the barriers to household financial security for low-income households and their various coping strategies. Popularised in the seminal *Portfolios of the Poor* (Collins et al. 2009) and *United States Financial Diaries* (Morduch and Schneider 2017), household financial diaries have been completed in at least a dozen countries. The method involves visiting participants several times a month, closely tracking income and expenditures, and building a corpus of both qualitative and quantitative data underwritten by repeat engagement, relationships, and trust. Applied to migration and development, such high-frequency detailed financial information may help us better understand the choices migrants and their families make, behaviours and interactions, and the nature of modern transnational migrant households (Clemens and Ogden 2020).

The Remittance Diaries is a dual-sided diaries project collecting transaction-level data each week from both Fijian PALM-long migrants and their households, specifically the remittance receiver, back home in Fiji for between five (our minimum data collection period) and twelve months in 2022–23, as well as additional information from thematic surveys and extended participant observation and discussions. To adapt the standard financial diaries methodology to study migration, we modified the core financial software instruments (FinBit) to better capture individual and household financial flows and focus more on international transfers, modalities, and consistent dual-sided measurement and accounting, and developed a series of three short one-off survey questionnaires covering intrahousehold decision-making, remittance tools and preferences, and migration history, aspirations, and intentions.[8]

[8] Our focus in this paper is, however, on the quantitative transaction data. Data collection for the Remittance Diaries was implemented in parallel to the country data collection for Fiji during the Global Small Firm Diaries project, led by the Financial Access Initiative at New York University, using the parallel teams, operational infrastructure, and quality controls.

Our sampling approach was purposive and non-random, seeking primarily to capture in detail the experiences of sufficient men and women in meat processing and the care sectors, the two main sectors in the PLS (now PALM-long), across regional Australia. Recruitment was rolling until our minimum quota of 30 pairs was reached, as recruitment for these time-intensive studies is typically far more difficult than for standard surveys even with incentives.[9] Remittance receivers were from the Suva, Nasinu, and Nausori municipalities to allow face-to-face visits (in the same areas as firms participating in the global Small Firm Diaries project, which ran in parallel). Data from migrant workers, dispersed widely across Australia, were collected via regular phone and video discussions, in their preferred language, by the same enumerator who interviewed their families each week in Fiji. For each pair, we collected at least 25 weeks of data, with many observed for up to a year. The final sample of 59 diaries participants includes 29 Fijian PALM-long migrants in Australia, who were neither at the start nor the end of their contracts in Australia, and 30 remittance receivers back in Fiji. Migrants were more likely to be men, and remittance receivers more likely to be women.

3.2. Migrant and remittance receiver transaction data

This paper uses the regular, high-frequency transaction-level data collected each week through the project's core FinBit software instruments, which in turn went through extensive quality checks, standardisation, and cleaning.[10] We convert the transaction data into fortnightly sums[11], for each remittance sender (migrant in Australia) and receiver (household in Fiji), by the category of the transaction, as some migrants are paid fortnightly, rather than weekly. Panel A of Figure 1 shows each worker's fortnightly income. Panel

[9] We use data from 29 pairs, dropping one "double receiver" with insufficient data. While the group is similar to typical Fijian PALM migrants, there must be some selection effect and we stress that the diaries are better thought of as a collection of detailed quantitative (and qualitative) case studies. At the time of recruitment, there were just 481 Fijians in Australia under the scheme. With just 20 in the care sector, our study covers much of this group. For meat processing, which dominates the scheme, it is a smaller share.

[10] "An Introduction to the Small Firm Diaries: Methodology and Process", released in February 2024, provides further details on the general software environment and cleaning process, including the removal of any suspicious outlier transactions.

[11] Calendar fortnight (Monday–Sunday) is the measure we use, rather than "fortnight in study". See Data Appendix for more details.

B shows the same workers' fortnightly remittances over the data collection period. Our remittance measure captures financial remittance transfers only, not in-kind goods or in-person cash.[12] Each individual time series in Figure 1 is characterised by fluctuations, motivating our focus on "within" estimation, exploiting deviations from workers' mean pay and regular remittances, throughout this paper.

Our phone-based collection approach prioritised face-to-face interviews with Fijian household members while allowing PALM workers to be located anywhere in Australia. Recent work confirms most phone-survey concerns are mitigated by repeat engagement and periodic cross-checking, two key tenets of our data collection approach (Beegle et al. 2012; Dabalen et al. 2016; Gourlay et al. 2021). Respondent fatigue is unlikely: weekly interviews were short (15–30 minutes), the same enumerator returned each week, and transaction variances show no systematic secular trends across participants' time in the study nor across individuals (see Appendix Figure A3). Measurement error in remittances is difficult to eliminate in any data source (De Arcangelis et al. 2023) but our approach directly addresses some of the most important sources: weekly recall windows are shorter than those in standard surveys, diaries capture transactions across all accounts (cf. administrative data, as in Joseph, Nyarko, and Wang (2018)), and our dyadic structure allows cross-validation between senders and receivers (Gibson and McKenzie 2017; Comola and Fafchamps 2014). Further details are in the Data Appendix.

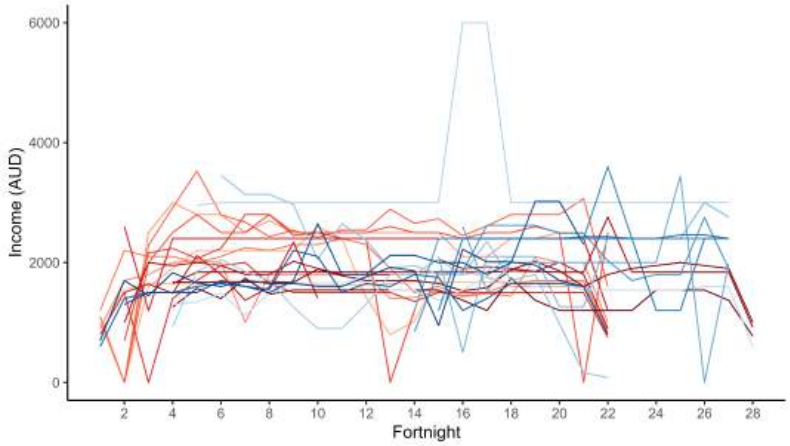
3.3. Descriptive statistics and visual evidence

Table 1 presents aggregate descriptive statistics on the personal finances of temporary migrants while abroad and their households back in Fiji. Each transaction type is aggregated to the participant-fortnight level. All figures are in local currency units: current (at the time of data collection) Australian dollars for the Fijian PALM workers in Australia, and Fijian dollars for their households back in Fiji. The two left columns summarise all participant-fortnight observations pooled together. The two right columns calculate

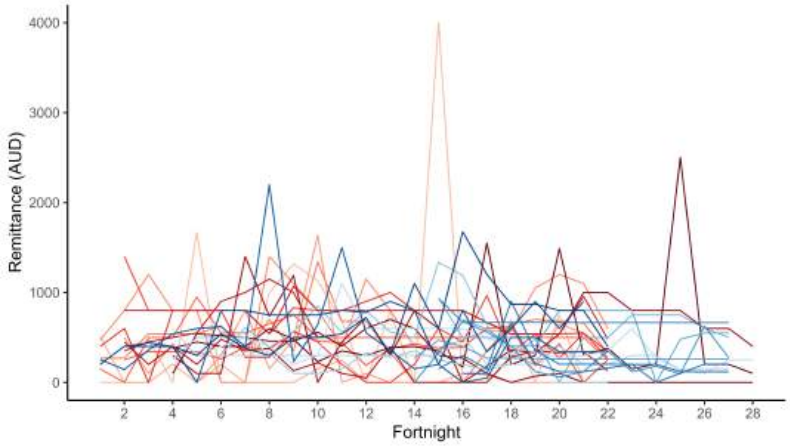
[12] This distinction matters less for within-individual contemporaneous elasticities than for total remittance levels. Please refer to the Data Appendix for a longer discussion of this issue.

FIGURE 1. FORTNIGHTLY INCOME AND REMITTANCES IN AUSTRALIA

A. Individual Migrant Incomes Over Time



B. Individual Migrant Outward Remittances Over Time



Notes: Panel A plots the individual fortnightly income time series for each Fijian PALM-long worker in the Fiji Remittance Diaries, by calendar fortnight (cf. fortnight in study, which differs by individual due to the rolling intake). Panel B plots the total fortnightly financial cash remittances sent back to Fiji by each of the same individuals. Fortnightly sums are calculated from transaction-level data collected weekly, but presented fortnightly for consistency, as some individuals are paid fortnightly. The entry and exit visible by individuals within the collected series reflect the rolling sampling intake and data collection. Each individual time series is plotted separately for easier visual inspection at Appendix Figures A1 and A2.

participant averages across all periods (i.e., "between" variation) then take the means across each participant's own average value over time.

Panel A of Table 1 shows that, on average in our dataset, Fijian PALM workers' fortnightly post-tax income is $1,943. Outward financial remittances are $459 on average, with the share of income remitted varying considerably across individuals (Appendix Figure A4). In a minority of cases (1 percent of income reports), taxes are included, and these figures do not strictly exclude post-tax deductions made by employers (e.g., repaying flights and regular health insurance payments, as some migrants have these included in what they reported).[13] Remaining fortnightly expenses, on average, sum to $566. $918 is left after subtracting remittances and other living and recreational expenses from income, presumably as savings for future expenditure, cash or in-kind remittances, or to take home as a lump sum. Removing the time dimension to look at the differences across migrants in the remaining two columns of Panel A shows that averages are similar but variances smaller, as expected.

Panel B of Table 1 shows the same calculations for Fiji-based counterparts of the workers in Panel A (i.e., remittance-receiving households). Average income for counterparts in Fiji is 633 FJD, which at the time of data collection was about 410 AUD (mid-market rate), around one fifth of what their counterpart in Australia earns. On average, about 90 percent of income comes through contemporaneous cash remittances from the migrant abroad. Unlike migrant workers, receiving households spend most of their income on expenses, rather than saving it. Fortnightly savings rates are around 30 percent. In terms of the relative costs of living in each country, at current exchange rates, which were not particularly volatile during this time, the Fijian household spends just under half what the individual migrant worker does each fortnight.

Figure 2 illustrates the full distributions of fortnightly income and remittance observations, pooled together across all migrant-fortnight observations and estimated via kernel density estimation. Panel A plots fortnightly income and remittances, revealing three

[13] See Appendix A—Data Appendix for a detailed explanation of the variables used, and Doan, Dornan, and Edwards (2023) for more details on PALM workers' finances in cross-sectional data from the first wave of the Pacific Labour Mobility Survey (PLMS), which finds similar levels and shares.

TABLE 1. FORTNIGHTLY SUMMARY STATISTICS

	All observations pooled		Average by participant	
	Mean	Std. Dev.	Mean	Std. Dev.
Panel A: Migrant workers in Australia (AUD)				
Income	1,943	655	1,968	414
Remittances	459	375	458	186
Expenses	566	353	574	234
Savings	918	710	935	453
N observations	556	556	29	29
Panel B: Remittance receivers in Fiji (FJD)				
Income	633	578	620	317
Remittances	566	522	561	266
Expenses	444	416	446	204
Savings	189	313	174	187
N observations	563	563	29	29

Notes: Amounts are all in current local currency units (Australian dollars in Panel A and Fijian dollars in Panel B) at the time of data collection. The level of aggregation of the underlying transaction data, collected weekly, is at the fortnight-participant level. The sample is a panel of 29 Fijian PALM workers observed for 5–12 months. The two left columns summarise all participant-fortnight observations pooled together. The two right columns calculate each participant's average value across all fortnightly time periods, then take the means across participants (migrants in panel A and remittance receivers in Panel B).

facts. One, that remittances are a small but non-trivial share compared to income each fortnight. Two, that the distribution of remittances is less dispersed than for income and centred tightly around the regular amounts. Three, that income has a bimodal distribution, reflecting large earnings differences across sectors (there are 17 workers in meat processing and six in aged care in our sample with respective average fortnightly incomes of $1948 and $2315. The remaining six workers are in other sectors). Panel B of Figure 2 splits the fortnightly remittance data (the blue curve in Panel A) by whether, on average across all weeks, the migrant earned above or below the median income in our sample. We cannot reject the null in an asymptotic two-sample Kolmogorov-Smirnov test at the 5% level that the two samples come from the same distribution, suggesting that higher income earners are not necessarily likely to regularly send any more money back home than their lower-earning counterparts. We interpret this pattern as similar to an Engel's Law, but for *regular* remittances (which also happen to be spent primarily on necessities). As income rises, the regular remittance share of income falls.[14]

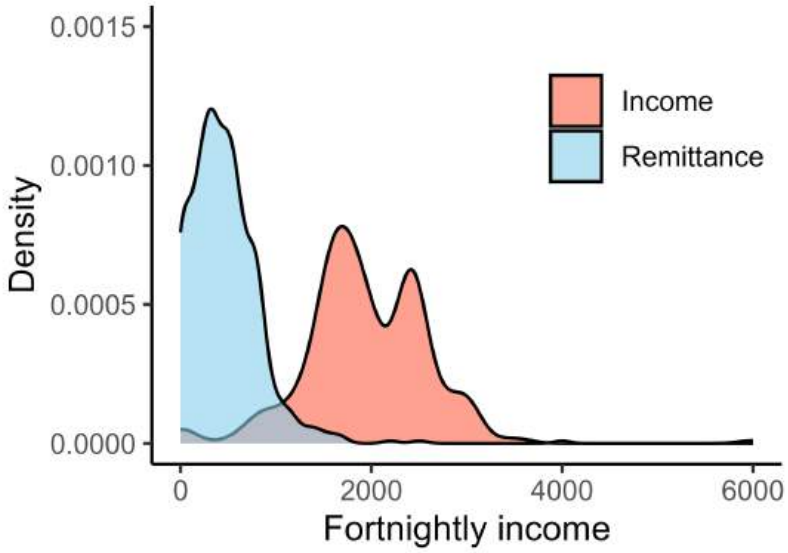
A natural question is then what happens with the additional income that does not appear to map neatly to higher regular remittances across migrants. Figure 3 produces the same above and below median income plots (as Panel B of Figure 2) for fortnightly expenses (minus remittances) and savings (the difference between all income and expenditures, including remittances).[15] Figure 3 reveals a significant gap between expenses, which are only slightly higher for above-median earners, compared to savings, which are, on average, almost double. While it does not look like higher earners are sending more money home each pay—and they do tend to spend a little more each fortnight—they have substantially higher savings, which are likely repatriated or spent later.

[14] In Appendix Figure A5 we show Figure 2 instead using the cross-section of migrant averages taken across all fortnights in the study. Distributions are again similar and not statistically distinguishable; note that as the Kolmogorov-Smirnov test relies heavily on sample size, this test is not particularly well-powered to detect genuine differences.

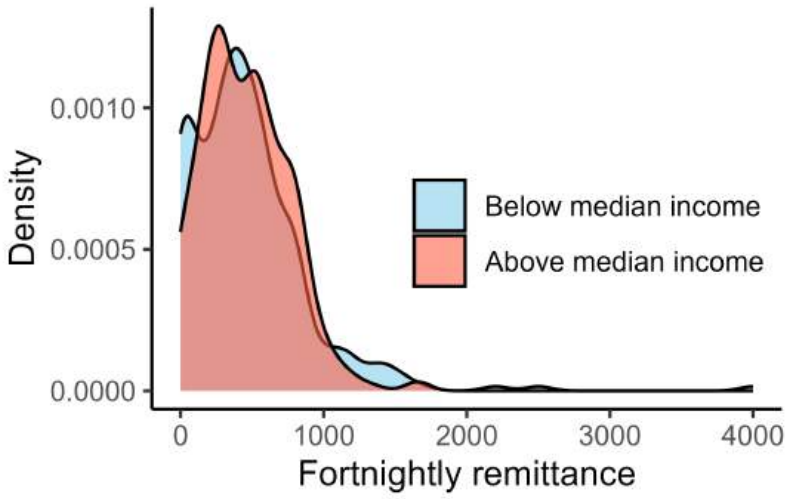
[15] Appendix Figure A6 shows Figure 3 instead using the cross-section of migrant averages taken across all fortnights.

FIGURE 2. DISTRIBUTIONS OF FORTNIGHTLY INCOMES AND REMITTANCES

A. Income and Remittances



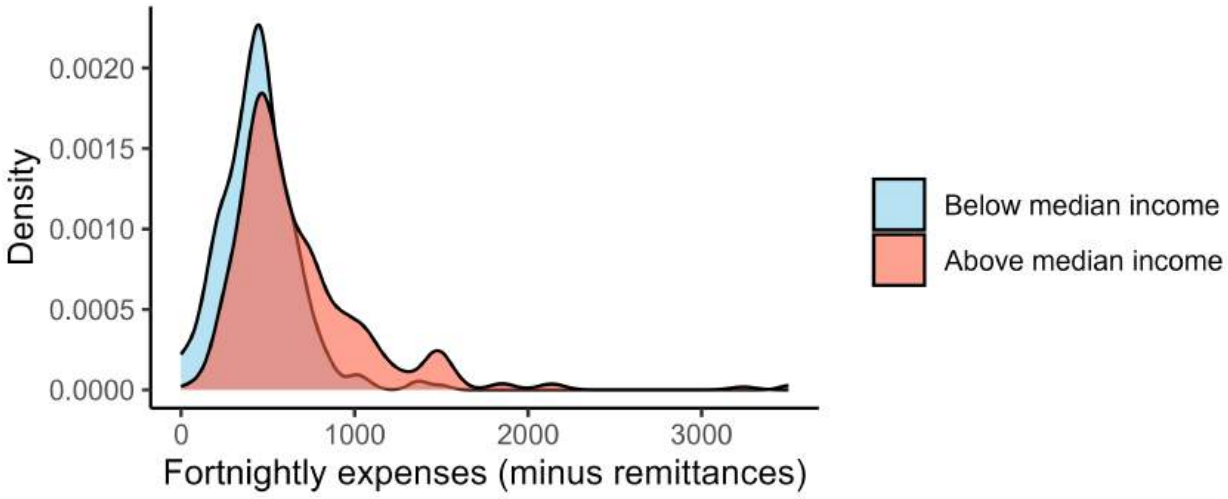
B. Remittances by Income Level



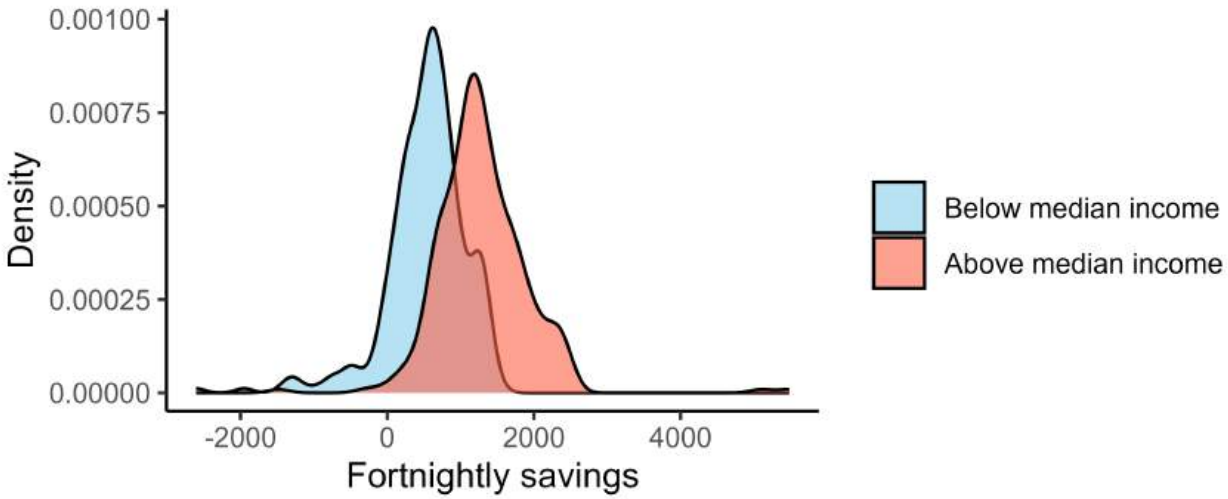
Notes: Panel A plots the kernel density estimates of fortnightly incomes and remittances, pooled across all migrant-fortnight observations. Panel B plots fortnightly remittances, the blue area in Panel A, split by whether the migrant, on average across all weeks, earned above or below the sample median of each migrant's average income. The distributions are similar if we instead use the cross-section of averages of each migrant's time series (i.e., the "between" variation). Please refer to Appendix Figure A5.

FIGURE 3. DISTRIBUTIONS OF FORTNIGHTLY EXPENSES AND SAVINGS

A. Expenses by Income Level



B. Savings by Income Level



Notes: Panel A plots the kernel density estimates of migrant fortnightly expenses (excluding remittances), split by whether the migrant, on average across all weeks, earned above or below the median average income for the sample. Panel B plots migrant fortnightly savings (income minus expenses), split by whether the migrant, on average across all weeks, earned above or below the median average income. The distributions are similar if we instead use the cross-section of averages of each migrant's time series (i.e., the "between" variation). Please refer to Appendix Figure A6.

4. Empirical strategy

4.1. Estimation and inference

We relate fluctuations in outbound international remittances to the income of Fijian PALM-long worker i at time t with simple panel data specification:

$$R_{i,t} = \beta Y_{i,t} + \delta_i + \gamma_t + \epsilon_{i,t} \tag{1}$$

where $R_{i,t}$ is total fortnightly (unless specified otherwise) outward international remittances, in Australian dollars, from migrant i at time t. $Y_{i,t}$ is total fortnightly income in the same period, in Australian dollars, almost exclusively from the individual's PALM scheme work. We take the natural logarithm of both variables to allow a direct elasticity interpretation. δ_i and γ_t are individual and time period (fortnight usually) fixed effects, capturing all time-invariant factors at the individual level and period-specific factors common to all individuals. Standard errors are clustered at the individual level and adjusted for arbitrary heteroskedasticity. As traditional cluster-robust standard errors can understate uncertainty with a small number of clusters, we also report p-values from wild cluster bootstrap standard errors (Cameron, Gelbach, and Miller 2008).[16]

The trade-off between depth and breadth lies at the heart of financial diaries data, allowing us to capture transaction-level detail across all accounts, qualitative transaction notes, and dual-sided data observation which goes well beyond the features in standard survey and administrative datasets.[17] With up to 28 fortnights of data per participant (Australia average: 23.6; Fiji average: 18.4), we have around 500 participant-fortnight observations throughout—not abnormal for panel data studies[18]—and our key results are detectable

[16] All analyses were conducted in R (R Core Team 2024). Regressions were estimated using the fixest package (Bergé 2018), except for system GMM models, which were implemented using plm (Croissant and Millo 2008). Wild cluster bootstrap standard errors were computed using fwildclusterboot (Fischer and Roodman 2021), and figures were produced using ggplot2 (Wickham 2016).

[17] While power in panel data depends on the total number of observations, our number of panel units is just 29, as the diaries are designed for more detailed individual analysis to build credible insights into the underlying financial challenges and strategies used by participants to weather risk over time and generate new hypotheses (cf. well-powered applied microeconometric analysis).

[18] For example, panel data studies of OECD countries routinely have 20–35 panel units and similar or fewer time periods (Kónya 2006; Bação et al. 2024).

across specifications with varying degrees of identifying variation and statistical leverage, despite the relatively small cross-section.

β is interpreted as follows: a one percent increase in income in fortnight t relative to an individual's average income—across all periods, given the within fixed-effects estimator—corresponds to a β percent increase in fortnightly outbound financial remittances in that period relative to her regular remittance. Using a log-log functional form as our primary specification (for its natural elasticity interpretation and to reduce the influence of outliers, salient given our relatively small sample) means we drop migrant-fortnight observations with zero values and estimate the elasticity conditional on remitting. In the extreme case, if a negative shock systematically leads people to remit zero, this response will be underestimated or missed completely by excluding these outcome realisations.

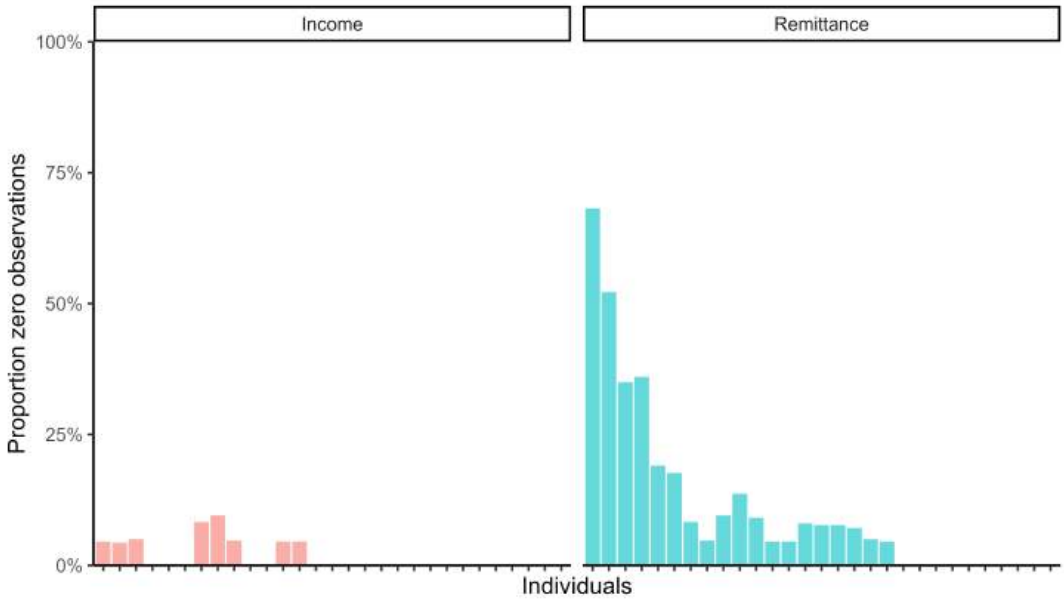
We address this issue in three ways. First, we report the number and proportion of zeros at each temporal frequency. Figure 4 shows that the 68 zero remittance observations (cf. the 488 non-zero observations) are concentrated in four individuals[19], and the vast majority of participant-fortnight observations are not zeros.[20] Second, we compare our results to those obtained from Poisson pseudo-maximum likelihood (PPML) estimates allowing zeros in the dependent variable, individual and time fixed effects, and an elasticity interpretation (Silva and Tenreyro 2006; Correia, Guimarães, and Zylkin 2020; Chen and Roth 2024). Similar results here suggest that the distinction between extensive (decision to remit) and intensive (how much to remit, conditional on remitting) margin effects is not quantitatively important in this particular application. Third, results from level-level specifications provide further reassurance that our results are not driven by omitting zeros.

[19] One is only supporting his single parent and does not have children to support, one sends monthly to her husband, and the other two travel to Fiji during the study and buy housing materials while there.

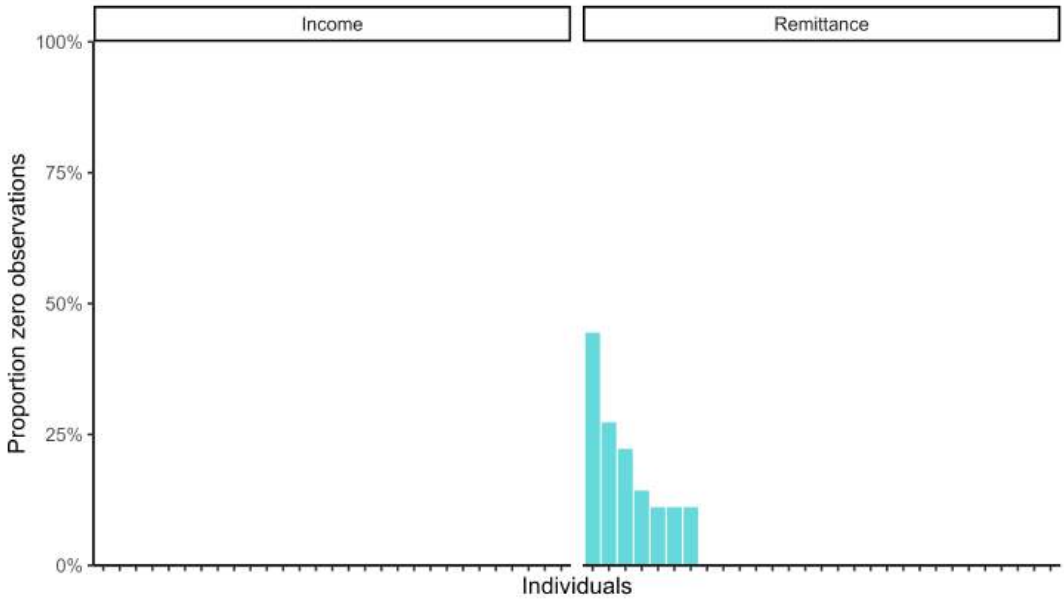
[20] Appendix Figure A7 plots zero values by individual over time. Note that we would, naturally, expect some zeros to be realised both on the income and expenditure side, and having no periods where there was a break for this cohort would be more abnormal and concerning. Importantly, the transaction notes provide no evidence of migrants strategically bunching remittances, which would make specifications using logs suffer from sample selection bias. Rather, we tend to observe migrants regularly send some share, save another share and send irregularly another share.

FIGURE 4. ZERO VALUES ACROSS INDIVIDUALS AND TIME

A. Fortnightly zero value observations per individual



B. Monthly zero value observations per individual



Notes: Panel A plots the percentage of zero income records, and zero remittance records, for individuals in the fortnightly data. Panel B plots the percentage of zero income records, and zero remittance records, for individuals in the monthly data. The white space shows the data included in our log-log elasticity specifications. See Appendix Figure A7 for a heatmap plotting individual zero value realisations over time for each individual.

4.2. Identification

β offers a causal interpretation if, conditional on individual and time fixed effects, within-individual variation in income is uncorrelated with the error term $\epsilon_{i,t}$. With individual fixed effects absorbing all time-invariant factors for each worker (i.e., sector, employer, wage rate, typical remittance commitments) and time effects absorbing common shocks (e.g., macroeconomic conditions and exchange rates, seasonal demand patterns, and holidays in Fiji or Australia), the main identification concern is omitted variables simultaneously affecting income and remittances in the same period: whether migrants can influence their earnings at the margin (e.g., anticipating requests from home).

Although such heterogeneity cannot be ruled out, three pieces of evidence support the exogeneity of within-individual income. First, PALM-long workers are employed at fixed hourly rates (minimum wages or the relevant modern industry awards, including the Meat Industry Award 2010) and cannot negotiate pay each period, unless roles change.[21] PALM workers are typically all trying to maximise their earnings while working overseas and any worker-initiated reductions in labour supply are primarily involuntary, like sick days (Mas and Pallais 2017). The key margin of concern is thus whether workers can systematically get more hours when more remittances are needed. However, variation in hours worked is fundamentally demand-driven from the employer, with variation in fortnightly earnings within individuals almost entirely due to employer-determined variation in rostered hours due to shift allocations, overtime availability, plant shutdowns, and fluctuations in processing demand. These dynamics have been documented so extensively in media (including cases of underpayment and low hours), by qualitative researchers (emphasising employer power), and by the fact that recent program reforms (since data was collected for this study) explicitly target these issues, especially workers not getting enough hours, that the threat of workers systematically adjusting their hours at the margin to meet demands back home is negligible (Department of Employment and Workplace Relations 2025).

[21] Any adjustments to the rate come from overtime penalty rates, where applicable, which are also set by law and industry awards, and are then a direct function of hours over time at particular times. Even when roles change, people are often reported to still be paid at the standard rates, rather than the higher rates they may be entitled to.

Second, examining income residuals, after removing individual and time effects, we see limited persistence (mild in fortnightly data and none in monthly), consistent with quasi-random scheduling on the employer side (see Appendix). The lack of any robust relationship between past (lags) and future (leads) remittances and current income provides additional evidence against labour supply adjusting in anticipation of future remittance needs (Table 3), as do the qualitative transaction notes in our data.[22]

Third, our estimates are stable across a range of different specifications. Beyond presenting results with different functional forms and temporal frequencies, we also estimated disciplined system generalised method of moments (SGMM) specifications (with collapsed instrument matrices and restricted lag depths) as a series of robustness checks (Roodman 2009). The convergent evidence is consistent with a relatively robust structural relationship rather than our results being an artefact of particular estimation or identification strategies.

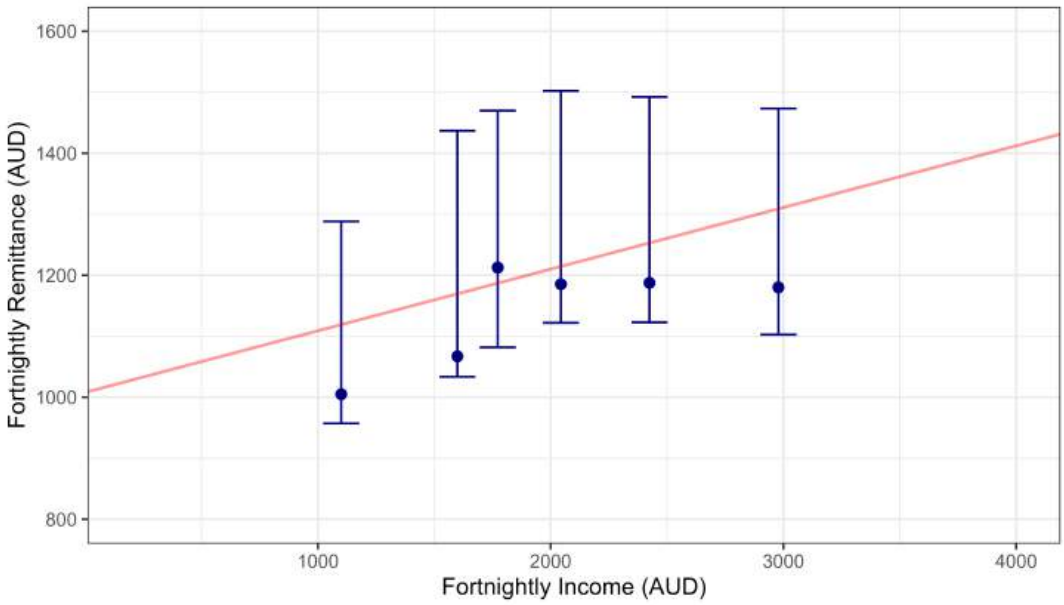
5. Main results

Our main result is that the within-individual elasticity of remittances is around 0.3, and that this appears to be principally driven by negative rather than positive deviations from migrants regular (i.e., median) earnings levels.

Figure 5 presents this plainly in a binned scatter plot of our main specification estimated in levels. Magnitudes are similar to those in Joseph, Nyarko, and Wang (2018) and Simpson and Sparber (2020) and should be interpreted not in isolation but with the stylised facts in Figures 2 and 3, where fortnightly remittances tend to be similar whether people earn above or below the median income over their stay (i.e., across migrant or "between" variation).

[22] In the remittance transaction notes, regular transfers dominate (i.e., remittance levels tend to be set in advance by household consumption needs back home) and irregular transfers largely relate to either unanticipated shocks (by definition, uncorrelated with demand in Australia) or long-term investments. We find no evidence that there is a class of transactions, however small, likely to drive week on week earnings in Australia, even if this was possible.

FIGURE 5. THE INCOME ELASTICITY OF REMITTANCES



Notes: This figure shows the binned scatter plot regressing level fortnightly remittances on level income with individual and time fixed effects. Confidence intervals are at the 95 percent confidence level and adjusted for arbitrary heteroskedasticity. The red line shows the slope of the two-way fixed effects regression in levels. Level-level is used here for visual clarity and results from level-level regressions of this form, as the main results that follow are log-log, are provided in tabulated form in the Appendix for completeness.

5.1. The income elasticity of remittances

Panel A of Table 2 presents the main estimates exploiting variation in income and remittances within individual migrants over time. Columns 1–2 present results using fortnightly individual panel data. Column 1 reports the partial correlation between income and remittances including only individual fixed effects to absorb level differences and exploit fluctuations within each migrant worker over time. A one percent increase in income in one fortnight, relative to workers' average income across all fortnights, is associated with a 0.4 percent increase in remittances in the same fortnight. Note that the minimum detectable effect here is approximately an elasticity of 0.336 and this estimate is statistically significant at conventional levels using both cluster-robust and the more conservative wild cluster bootstrap standard errors. Column 2 adds time period fixed effects, for a traditional two-way fixed effects within estimator, and finds a smaller

elasticity of 0.26, statistically significant at the ten percent level with cluster-robust standard errors but not with the bootstraps. Columns 3–4 present the same two estimates using monthly data. Here, transactions are summed within individuals by type over the month rather than fortnight, reducing the volatility significantly. These two estimates are of similar magnitude and precision to those obtained from fortnightly data, except slightly larger in our preferred specification (Column 4) with an elasticity of 0.34. Analogous estimates using weekly data are provided in the Appendix for completeness.

TABLE 2. REMITTANCE AND EXPENDITURE ELASTICITIES FOR REMITTANCE SENDERS

	Fortnightly data		Monthly data	
Column	(1)	(2)	(3)	(4)
Panel A: ln(remittances)				
log (income)	0.3976***	0.2622*	0.3697**	0.3430*
	(0.1219)	(0.1478)	(0.1640)	(0.1919)
Wild cluster bootstrap p-value	0.006	0.103	0.044	0.107
N observations	484	484	226	225
Panel B: ln(expenses)				
log (income)	0.5766***	0.4202***	0.5034***	0.4809***
	(0.0933)	(0.0821)	(0.1279)	(0.1229)
Wild cluster bootstrap p-value	0.000	0.005	0.004	0.009
N observations	545	545	239	238
Individual FE	Y	Y	Y	Y
Time period FE	N	Y	N	Y

Notes: Regressions of log fortnightly/monthly income on log fortnightly/monthly remittances and expenses, detailed in Equation 1. The estimation sample is a panel of 29 Fijian PALM workers observed weekly (and aggregated to the fortnight/month here) for between 5–12 months. Columns 2 and 4 use a standard two-way fixed effects estimator, with fixed effects for every individual migrant and calendar fortnight/month. Cluster-robust standard errors are in parentheses and stars denote statistical significance at the 10, 5 and 1 percent levels.

How do income-consumption elasticities compare to those for remitting money home, and are remittances more elastic than other migrant expenditures? Panel B of Table 2 shows results using the natural logarithm of *other* migrant expenses (i.e., remittances are also recorded as an expense) captured in the financial diaries as the dependent variable. Column 1 returns a coefficient of 0.58 including only individual fixed effects and Column 2 returns 0.42, both larger than those for remittances, statistically significant at the 1 percent level, and robust to bootstrap standard error corrections. Here, the minimum detectable effect is approximately half of the estimated coefficients. Recall from Table 1 that expenses are not much larger than remittances, but do have greater variance across participants. Estimates using monthly data in Columns 3 and 4 of Panel B reveal the same overall pattern as in Panel A: similar magnitudes, which shrink slightly and become less precisely estimated when time effects are added.[23]

5.2. Identification checks

The main identification concern is migrants potentially adjusting their labour supply on the margin to meet anticipated or realised remittance requests from back home. Although the PALM scheme setting naturally limits the scope for this type of behaviour, our panel data allow us to conduct falsification tests using leads and lags of remittances to test for correlations between remittance dynamics and current incomes. Table 3 presents these results. Columns 1 and 3 show that there is no statistically significant relationship between past remittances and current incomes in fortnightly and monthly data. Adding second lags (Columns 2 and 4) reveals a positive and statistically significant relationship with remittances two fortnights ago, but this is not present in the monthly data and of the opposite sign. The remainder of the table uses leads, finding that future remittances are not associated with current income.[24]

[23]The closest comparable estimates of the marginal propensity to consume for low-income workers in Australia are those in Hamilton et al. (2024) finding a marginal propensity to consume ordinarily inaccessible retirement income of 0.43–0.48 within eight weeks, with gambling the largest spending category. Ganong et al. (2025) also find that low-income workers in the United States spend the majority of transitory income, broadly consistent with our estimated magnitudes here.

[24]Note also that each lag reduces the sample size. For example, going from the first to the first and the second reduces the sample by 10-20 percent (depending on temporal aggregation), and this issue is also

TABLE 3. PLACEBO TESTS—PREDICTING MIGRANT EARNINGS WITH REMITTANCE LEADS AND LAGS

Dependent variable	ln (income)							
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Lags				Leads			
	Fortnight		Month		Fortnight		Month	
ln(L1 remit)	0.0174	0.0253	0.0476	0.0515				
	(0.0168)	(0.0190)	(0.0387)	(0.0461)				
ln (L2 remit)		0.0372***		-0.0418				
		(0.0121)		(0.0384)				
ln (F1 remit)					0.0061	0.0111	-0.0184	-0.0052
					(0.0154)	(0.0177)	(0.0196)	(0.0298)
ln (F2 remit)						-0.0212		-0.0268
						(0.0214)		(0.0252)
Observations	457	404	199	164	453	400	196	160

Notes: Regressions of log fortnightly/monthly remittances on log fortnightly/monthly income. The estimation sample is a panel of 29 Fijian PALM workers observed weekly for between 5–12 months. A standard two-way fixed effects estimator, with fixed effects for every individual migrant and calendar fortnight, is used throughout. Columns 1–4 use lags to explore whether past remittances predict current income, and Columns 5–8 use leads to explore whether future remittances predict current income. Cluster-robust standard errors are in parentheses, and stars denote statistical significance at the 10, 5 and 1 percent levels.

A second way to deal with potential time-varying omitted variables is through an instrumental variables approach. The ideal natural experiment here may have been sector-specific shocks in Australia, but this is not an option with our two main sectors (aged care and meat processing) and relatively small sample. An alternative is instrumenting current earnings with lagged values and lagged differences under the assumption that past earnings levels are correlated with current earnings levels but not with current idiosyncratic shocks to remittances (Blundell and Bond 2023). Thus, as a supplementary robustness check, we allow income to be endogenous and estimate a set of disciplined dynamic panel system GMM specifications instrumenting both income and remittance levels with lagged differences and differences with lagged levels. Estimates include individual fixed effects, the instrument matrix is collapsed (reducing overfitting risks and improving diagnostic test reliability), lags are varied for sensitivity, and two-step Windmeijer (2005) finite-sample standard error corrections are applied throughout (Roodman 2009).[25]

Table 4 presents supplementary SGMM estimates of the income elasticity of remittances, using our main fortnightly dataset. Column 1 uses lags 2–3, Column 2 uses 2–4, and so forth up to 2–10 in the final column. Column 1 returns a larger elasticity of 0.65, statistically significant at conventional levels and consistent with some degree of attenuation bias. All diagnostics are satisfied: the two Arellano-Bond tests for serial correlation are statistically significant (AR(1)) and statistically insignificant (AR(2)), the Hansen-Sargan test of over-identifying restrictions does not reject instrument validity nor suggest that instrument proliferation substantially reduced the power of the test, as expected given the number of instruments and 29 groups across all specifications. Estimated coefficients and diagnostics are remarkably stable across all of the columns in Table 4.

present in the following table and one underlying motivation for adopting the contemporaneous specification as our preferred, given the already small sample size.

[25]We opt for system over the difference GMM as earnings are somewhat persistent and this approach is considerably more reliable, diagnostics-wise, and efficient (Blundell and Bond 1998).

TABLE 4. Robustness—System GMM Estimates, Varied Lags

Lags IVs used	2:3	2:4	2:5	2:6	2:7	2:8	2:9	2:10
ln (income)	0.653***	0.629***	0.588***	0.578***	0.588***	0.592***	0.614***	0.610***
	(0.073)	(0.074)	(0.078)	(0.095)	(0.103)	(0.099)	(0.099)	(0.105)
lag (ln (remit))	0.186**	0.223**	0.273***	0.264**	0.244*	0.239*	0.205*	0.211*
	(0.087)	(0.091)	(0.096)	(0.114)	(0.126)	(0.124)	(0.122)	(0.127)
AR(1) p-value	0.007	0.009	0.008	0.007	0.015	0.015	0.014	0.017
AR(2) p-value	0.709	0.55	0.35	0.408	0.513	0.525	0.653	0.641
Sargan p-value	0.566	0.424	0.347	0.29	0.328	0.404	0.471	0.522
N instruments	6	8	10	12	14	16	18	20
N groups	29	29	29	29	29	29	29	29

Notes: Dynamic system generalised method of moments estimates of log fortnightly remittances on log income, with instrument (income and remittance) lags specified in the top column. The estimation sample is a panel of 29 Fijian PALM workers observed weekly (and aggregated to the fortnight here) for between 5–12 months. Individual fixed effects are included, the instrument matrix is collapsed, and Windmeijer finite-sample corrections made to standard errors (in parentheses) throughout. Stars denote statistical significance at the 10, 5 and 1 percent levels.

5.3. Further robustness and sensitivity analyses

The first set of sensitivity analyses relates to the functional form. Poisson pseudo-maximum likelihood (PPML) estimates are presented in the Appendix. That these are similar in direction, magnitudes, and precision suggests that the distinction between extensive (decision to remit) and intensive (how much to remit, conditional on remitting) margin effects is not quantitatively important here. Log-log specifications may also mislead due to the scale, as it does not follow that pass-through rates in logs will be similar in levels. Level-level estimates provide further reassurance that our results are not driven by omitting zeros, reducing outlier leverage, or log scaling. The second set of checks alternate the temporal bandwidth for aggregation. We focus on fortnights because some people are paid fortnightly. Tables 2–4 showed similar results when fortnightly volatility is smoothed out in monthly data. Equivalent estimates using weekly data are in the Appendix.

5.4. The marginal propensity to consume remittance income

A unique advantage of our data is the dyadic simultaneous collection from both sides of the transnational household, which allows us to estimate the same income-expenditure elasticities for both sides and compare the relative sensitivity of expenditures to fluctuations in income for the migrant versus their family back home. The remittance pass-through of income shocks in Australia, which clearly affect remittances sent, which in turn are the primary source of cash income for receiving households, naturally offers exogenous variation to recover the marginal propensity to consume in Fiji.[26]

Table 5 presents four sets of expenditure (in Fijian dollars) elasticities, using both fortnightly and monthly data (mirroring the Table 2 specifications), for Fijian remittance-receiving households: for remittance income reported in Fijian dollars in the Fijian data (Panel A), for total income reported in the Fijian data (Panel B), for remittances reported by their remittance-sender in Australian dollars in the Australian data (Panel C), and for total income reported by their remittance-sender in the Australian data (Panel D). Column 1 of Panel A shows that a one percent increase in remittances received in one fortnight, relative to households' average remittances across all fortnights, is associated with a 0.72 percent increase in expenditure in the same fortnight. Across all columns of Panel A, we see that expenditure back home in Fiji is highly elastic—in other words, it is highly sensitive to the money sent home by their family member abroad. The monthly estimates in Columns 3 and 4 are slightly smaller than the fortnightly estimates and the implied minimum detectable effect throughout is a fraction of the estimated elasticities. Panel B uses log total household income as the explanatory variable. Although remittances account for most of remittance-receiving households' income (Table 1), many participants have residual income. These estimated elasticities are all larger than for remittance income alone (Panel A) and statistically significant at the one percent level.

[26] Non-cash income and consumption, for example from subsistence agriculture, communal resources, or in-kind support from extended family, are not as clearly captured in financial diaries data and may provide an additional buffer, though our sampling frame naturally limits this with our focus on urban and peri-urban households in the Suva-Nausori corridor.

TABLE 5. EXPENDITURE ELASTICITIES FOR REMITTANCE RECEIVERS

	Fortnightly data		Monthly data	
Column	(1)	(2)	(3)	(4)
Panel A: Fijian sample, ln (expenses)				
ln (remittances)	0.7211***	0.7123***	0.6653***	0.6314***
	(0.0328)	(0.0342)	(0.0494)	(0.0506)
Wild cluster bootstrap p-value	0×10^{-16}	0×10^{-16}	0×10^{-16}	0×10^{-16}
Observations	504	504	232	232
Panel B: Fijian sample, ln (expenses)				
ln (income)	0.8019***	0.7919***	0.7963***	0.7784***
	(0.0311)	(0.0331)	(0.0495)	(0.0524)
Wild cluster bootstrap p-value	0×10^{-16}	0×10^{-16}	0×10^{-16}	0×10^{-16}
Observations	524	524	234	234
Panel C: Cross-country: Fijian sample, ln (expenses)				
ln (migrant remittances)	0.4480***	0.4371***	0.4016***	0.3906***
	(0.0785)	(0.0720)	(0.0938)	(0.0921)
Wild cluster bootstrap p-value	0×10^{-16}	0×10^{-16}	0×10^{-16}	0×10^{-16}
Observations	473	473	214	213
Panel D: Cross-country: Fijian sample, ln (expenses)				
ln (migrant income)	0.4521***	0.3294***	0.1803	-0.0083
	(0.0792)	(0.0765)	(0.1115)	(0.1500)
Wild cluster bootstrap p-value	0×10^{-16}	0.0310	0.2030	0.9550
Observations	501	501	221	220
Individual FE	Y	Y	Y	Y
Time period FE	N	Y	N	Y

Notes: Regressions of log fortnightly/monthly expenses on log fortnightly remittances reported by remittance-receivers (Panel A), reported by remittance-receivers' total income (Panel B), total remittances reported by the migrant (Panel C), and total migrant income (Panel D), similar to Equation 1. The estimation sample is a panel of 29 remittance-receiving households in Fiji observed fortnightly/monthly for between 5–12 months. Panels A and B use only data on remittance-receivers; Panels C and D use linked dyadic data of migrants' income and remittances and receivers' expenses. Columns 2 and 4 use a standard two-way fixed effects estimator, with fixed effects for every participant and calendar fortnight/month. Cluster-robust standard errors are in parentheses and stars denote statistical significance at the 10, 5 and 1 percent levels.

The remaining two panels of Table 5 combine the Australian and Fijian data to use remittances as reported by the sender as the explanatory variable. Column 1 of Panel C suggests that a one percent increase in fortnightly remittances is associated with a 0.45 percent increase in expenditure in the same fortnight. Coefficients are again relatively stable and not statistically different from one another after adding time fixed effects, or when using monthly data. The only difference emerges in Panel D: while fortnightly data give similar results for both migrant income and migrant remittances, the monthly data reveal no statistically significant relationship between fluctuations in monthly income abroad and expenditures in Fiji. This is not especially surprising, since remittances sent are just a fraction of earnings in Australia and, as we will show shortly, exhibit some heterogeneity with respect to the direction of earnings fluctuations in Australia. Overall, remittance-receivers' expenditures are more elastic to fluctuations in income than the expenditures of their migrant counterparts working in Australia under the PALM scheme, with implications for risk-sharing and the transmission of income risk across borders.

We stress three practical limitations of this exercise. First, most migrants send to more than one person, so sender-receiver pairs are not strictly one-to-one with respect to all remittances sent (though most go to the one receiver). Thus, migrant income shocks are only partially reflected in receiver income, likely attenuating these estimates. Second, transactions by senders to receivers within the same fortnight are not perfectly aligned in timing (e.g., if one is picked up in the next fortnight for another; we use Monday–Sunday fortnights). Third, currency conversions introduce exchange rate and conversion noise. Yet, in an important data validation check, we compare dyadic transaction pairs in Appendix Figure A11. Consistent with the patterns in Panels C and D of Table 5, there is a strong correspondence within individual pairs.

6. Potential heterogeneity

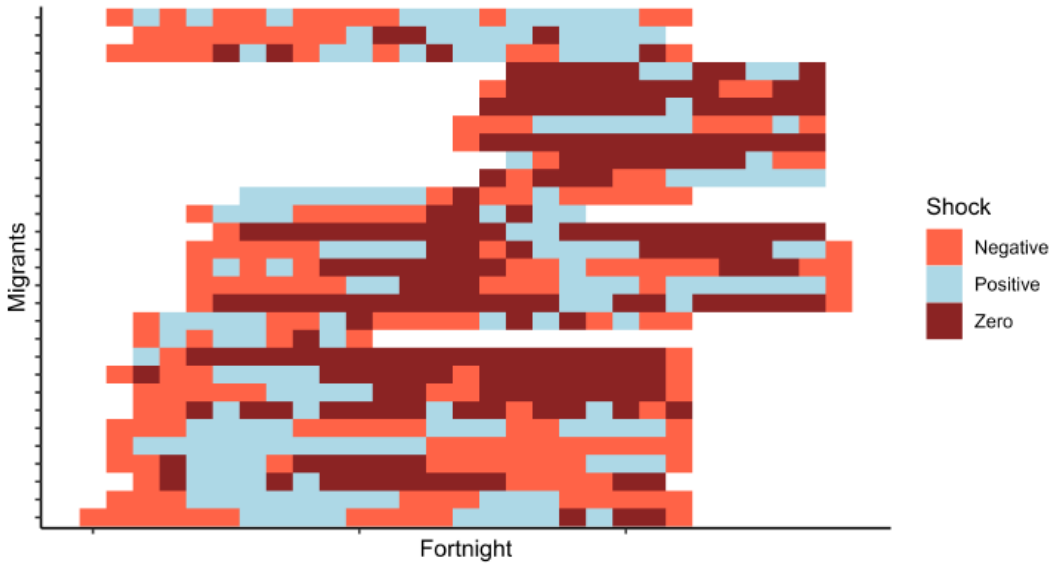
The natural next questions are whether migrant remittance behaviours respond differently depending on whether the income shock is positive or negative (Joseph, Nyarko, and Wang 2018) and whether any such heterogeneity passes through to different expenditure responses in Fiji. Given our data limitations, we approach this question primarily through a descriptive empirical lens, rather than incorporating any deeper theoretical or qualitative analysis of migrant remittance decision making, or using the dynamic estimators introduced as supplementary analyses above.

6.1. Estimating equation

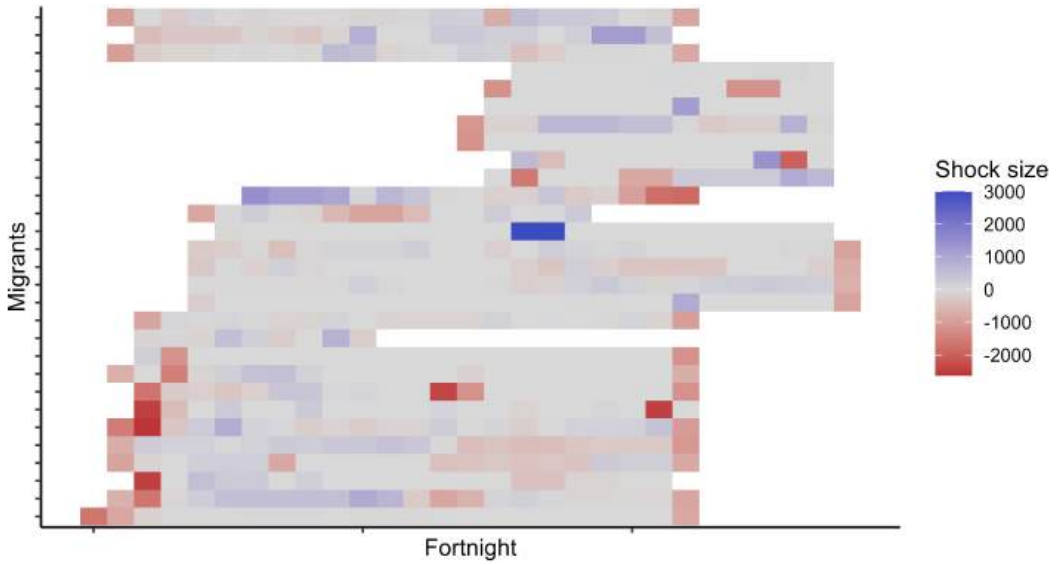
The key challenge in exploring heterogeneity is statistical power. A common approach, including by Joseph, Nyarko, and Wang (2018), is to use interaction terms. However, holding all else constant, a sample size up to 16 times larger is often needed to detect an effect of the same magnitude as the main effect (Gelman 2018). As we are already working in a highly constrained power environment, we adopt a simpler and more transparent approach, not least because interaction terms would be prohibitively uninformative. We first assign participant-fortnight observations into three groups: observations above that participant's median income over all study fortnights (N=199), observations below that participant's median income (N=213), and a third control group of observations at each individual's median income (N=151). We opt for median here because many fortnights coincide with each migrant's regular (median) pay and this allows for three natural groups, yielding cleaner comparisons with a well-defined excluded group. Panel A of Figure 6 shows how this looks in the data. We construct similar intensity measures: absolute level deviations above (mean 101, standard deviation 277) or below (mean 159, standard deviation 394) each migrant's median income. This indicator is plotted for each individual and fortnight in Panel B, highlighting the intensity of fluctuations realised by Fijian PALM workers in our sample (similar to Figure 1 except centred within individuals).

FIGURE 6. POSITIVE AND NEGATIVE SHOCK INCIDENCE

A. Treatment and control group assignment



B. Shock intensity across individuals and time



Notes: Panel A shows a heatmap at the fortnightly level of positive, negative and zero shocks to migrant workers' incomes. The shocks are calculated as dollars above or below each migrant's median income. Those with an even number of income observations have a median which is an average of the two centre values, which results in no matching zero-shock fortnights for those migrant workers. There are 199 positive shocks, 213 negative shocks and 151 no shock fortnightly observations. In the monthly data the corresponding numbers are 100, 94 and 40 respectively. Panel B shows the size of positive and negative shocks as described above.

To explore how this variation relates to remittances and expenditures, we estimate augmented versions of our main specification:

$$R_{i,t} = \beta_1 P_{i,t} + \beta_2 N_{i,t} + \delta_i + \gamma_t + \epsilon_{i,t} \tag{2}$$

where $R_{i,t}$ is total fortnightly outward international remittances or expenses from participant i at time t. $P_{i,t}$ is either (a) dichotomous treatment indicator equal to one if, in a given period, an individual earns income higher than their individual-specific median or (b) a continuous intensity indicator with the amount in dollars that fortnight's income is higher than the respondent's median. $N_{i,t}$ is the negative equivalent. When both indicators are included, the omitted category is periods at individual median earnings. When one indicator is included, observations at or below the median for the positive indicator and at or above the median for the negative indicator form the omitted category. δ_i and γ_t are again individual and time period fixed effects and $\epsilon_{i,t}$ is the cluster-robust error term. P-values from wild cluster bootstrap standard errors are also reported throughout (Cameron, Gelbach, and Miller 2008).

6.2. Results on the asymmetric transmission of income risk

Table 6 presents these results for remittances (Australian data), expenses in Australia, and expenses in Fiji. The first three columns show the impact of whether there is a shock (i.e., the extensive margin, agnostic to shock size) and the final three columns show the impact of the size of the shock (i.e., on the intensive margin).

Table 6, Panel A, Column 1 shows that, in fortnights with abnormally high pay (relative to both the median pay and low pay weeks), there is on average a 0.68 percent increase in remittances (about 27 dollars if we opt for a level-level specification; see Appendix). Column 2 shows that fortnights with abnormally low pay (relative to median and high pay weeks) correspond to a 9 percent decrease in remittances (about 70 dollars if levels are used). Neither coefficient is statistically significant. Including both the negative and positive indicators together in Column 3 (shrinking the implicit within-individual control

group to only the median earnings) sees the coefficient on the positive shock flip in sign and remain statistically indistinguishable from zero, while the coefficient on the negative shock increases in size and precision, to a 13.7 percent decrease, statistically significant at the 5 percent level. Relative to a median fortnight, a fortnight with below-median earnings is on average associated with around 14 percent less remittances being sent home.[27]

These patterns suggest a clear prioritisation of expenditures. First, meeting the migrant's basic consumption needs while abroad. Second, providing a floor of regular support for the family back home, and third, saving for lumpier transfers, future investments, or to carry back home upon return. Such a hierarchy is consistent with recent intrahousehold bargaining research where male earnings are allocated first to the earner's own minimum consumption, then a floor of household support, then savings and discretionary spending (Carranza et al. 2025; Riley 2024). From the receiving household's perspective, the asymmetric pass-through inverts what standard models of efficient risk-sharing predict (i.e., the wealthier or less risk-averse side absorbs risk). The poorer side of the transnational household here effectively insures the higher earner against potential negative income shocks by absorbing reductions in remittances when hours fall without reciprocal gains when hours rise.

As the binary indicators will mechanically overweight small shocks and underweight large shocks, by treating them equivalently, Columns 4–6 of Table 6 present analogous estimates using our continuous shock indicators. Here, the coefficients on the positive income shocks are again small and not statistically distinguishable from zero, but the coefficient on the negative shock is around 0.15 (not comparable, as in levels) and more precisely estimated.

[27] One potential concern in interpreting these asymmetric effects is asymmetric variance: if negative shocks have higher variance, and thus more statistical power, we will be more likely to observe these effects mechanically and they might not represent genuine behavioural differences. Our results likely represent some combination of both: while the distribution of positive and negative shocks is similar (Panel B of Figure 6), negative shocks do have a higher mean (159 vs. 101) and standard deviation (394 vs. 277).

TABLE 6. ASYMMETRIC RESPONSES TO INCOME SHOCKS

Explanatory variable:	Shock dummy			Shock intensity (level)		
Column	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Migrant sample	*ln (remittances)*			*remittances (level)*		
Positive shock	0.0068		-0.0743	0.0626		0.0336
	(0.0622)		(0.0622)	(0.0490)		(0.0493)
Wild bootstrap p-value	0.9130		0.2340	0.1900		0.4930
Negative shock		-0.0904	-0.1366**		-0.1503***	-0.1461***
		(0.0590)	(0.0604)		(0.0395)	(0.0394)
Wild bootstrap p-value		0.146	0.029		0.001	0.002
N observations	487	487	487	555	555	555
Panel B: Migrant sample	*ln (expenses)*			*expenses (level)*		
Positive shock	0.1878***		0.2135***	0.1049		0.0806
	(0.0429)		(0.0517)	(0.0848)		(0.0767)
Wild bootstrap p-value	0.000		0.000	0.274		0.359
Negative shock		-0.0982*	0.0403		-0.1323**	-0.1223**
		(0.0513)	(0.0570)		(0.0543)	(0.0559)
Wild bootstrap p-value		0.067	0.494		0.053	0.085
N observations	549	549	549	555	555	555
Panel C: Fiji sample	*ln(expenses)*			*expenses (level)*		
Positive shock	0.6027***		0.3436***	0.7221***		0.6528***
	(0.0651)		(0.0766)	(0.1009)		(0.1014)
Wild bootstrap p-value	0		0	0.0010		0.0020
Negative shock		-0.6197***	-0.3730***		-1.096***	-0.6449***
		(0.0512)	(0.0511)		(0.1053)	(0.0605)
Wild bootstrap p-value		0.000	0.000		0.000	0.000
N observations	528	528	528	562	562	562

Notes: Columns 1-3 show regressions of log remittances and expenditures on dichotomous treatment indicators reflecting whether a fortnight-participant income observation is above or below that participant's median income over the study period with individual and time period fixed effects included throughout. Columns 4-6 show regressions of the level of remittances or expenditure on continuous variables of the size of the positive or negative shock (dollars above/below participant's median income) at the fortnight-participant level. The estimation sample is a panel of 29 Fijian PALM workers (their household counterparts in Fiji in Panel C) observed fortnightly for between 5–12 months, and income shocks here are for their total income, not only remittance income. Cluster-robust standard errors are in parentheses and stars denote statistical significance at the 10, 5 and 1 percent levels.

Taken together, the estimates in Panel A suggest that our main contemporaneous estimates are driven by negative rather than positive deviations from migrants' typical earnings. This is consistent with what we observe in the accompanying transaction notes, which cumulatively suggest that a great deal of the remittances sent are either planned out or in response to requests back home. The notes also make clear that migrants occasionally send from their savings. For example, one migrant sent AUD 300 to his mother and to support his children when he was unable to go to work. Another participant in Australia withdrew AUD 900 from savings specifically for a house extension in Fiji, which we see received in his wife's account. At the same time, with remittances the primary and often only source of income for family members left behind, there may be reason to be concerned about this finding of immediate pass-through of only negative shocks abroad to family members back home. A series of recent welfare measures has been put in place with respect to minimum hours, minimum pay, and employer deductions. If effective, such protections may be as beneficial for remittance receivers back home as for the migrants themselves (Department of Employment and Workplace Relations 2026a, 2025).

Panel B of Table 6 turns to migrant expenditures while in Australia. Here, we see very mixed results. Using the dichotomous indicators, positive shocks are associated with higher contemporaneous expenditures, and the magnitudes are quite large, robust to using single or both indicators together, and precisely estimated. The coefficients on the binary negative shock indicators are more indeterminate and imprecisely estimated, changing in sign and statistical significance as the implicit control group changes. Using the continuous indicator, in Columns 4–6, sees this pattern reverse: a robust negative effect in level terms associated with the negative shocks and imprecise estimates for the positive shock. Overall, Panel B illustrates a mildly pro-cyclical association between earnings and expenditures, more visible for positive shocks when the fluctuations are not scaled for their size, and vice versa for the negative shocks.

Thus, for migrant remittances, it matters whether there is a negative income shock and its size, while this is not the case for positive shocks. For migrant expenditures, it matters whether there is a positive shock but not its size, as only the former is statistically discernible. While any negative shock is less likely to affect expenses other than remittances, its size appears to matter more than for positive shocks in terms of any systematic statistical relationship on the intensive margin. People may thus be able to absorb or smooth small negative shocks, but only to a point. These patterns are consistent with precautionary savings, which help absorb small negative shocks but are easily overwhelmed with large ones, and asymmetric adjustment costs.

Panel C of Table 6 presents the same results for remittance-receivers in Fiji. These results provide a striking contrast to the previous two panels. Consistent with their much larger elasticities estimated in Table 5, we see much larger expenditure responses to our dichotomous shock indicators. Column 1 of Panel C shows a 60 percent increase in expenditure, on average, in fortnights with income above the within-household median over our sample (relative to median and below-median weeks). Column 2 shows that the magnitude is approximately the same, but the opposite direction, for a negative shock. Including both indicators in Column 3 reduces the magnitudes, as expected (because the control group no longer includes the opposite shocks), but the relative elasticities are similar on either side. A similar pattern emerges using the continuous intensity indicators in Columns 4–6. The expenditures of remittance-receiving households, unlike any of the estimates for the Fijian migrants in Australia, thus do not respond asymmetrically to income shocks: expenditures tend to fall when incomes fall and rise almost symmetrically when incomes rise, and we find no evidence of consumption smoothing (Kazianga and Udry 2006). We also find no evidence of any clear distinction between extensive and intensive margin effects, which characterise the story for the migrant sample in Australia.[28]

[28] An important question we can thus only partially address is how remittance-receiving households in Fiji cope when negative income shocks are passed through. Our sample size does not allow us to explore margins of adjustment in detail (e.g., whether households draw down on savings, reduce certain categories of expenditure more, and so forth). With an average fortnightly savings buffer of just 189 FJD, the scope for self-insurance seems limited Edwards (2020).

7. Conclusion

We used high-frequency financial diaries from 29 Fijian PALM workers in Australia and their families back home in Fiji to study how remittances respond to earnings fluctuations within individual migrant workers over time. A one percent increase in earnings corresponds to between a 0.26 percent (fortnightly data) and 0.34 percent (monthly data) increase in remittances in the same period. Our dyadic data structure allows us to close the transmission chain. Exploiting plausibly exogenous variation in sender earnings in Australia, we estimate the marginal propensity to consume remittance income among receiving households in Fiji at around 0.7.

We find that these average responses, however, mask potentially important asymmetry. Remittances respond primarily to negative rather than positive earnings shocks, consistent with the model of private asymmetric information developed in Joseph, Nyarko, and Wang (2018) and the expenditure prioritisation framework outlined in the previous section. PALM migrants in our sample send similar regular remittance amounts home regardless of their earnings level. Thus, regular remittance budget shares follow a type of Engel's Law, falling as income rises. As the gap for higher earners, by definition, is consumed abroad, saved for lumpier transfers, or carried back for expenditures upon return, such a pattern for regular remittances does not preclude higher earners accumulating more savings and taking or sending more money home overall.

Taken together, our estimates paint a clear and coherent picture of migrant financial decision-making under this scheme. Migrants know how much to send regularly to meet consumption needs back home. They do not raise regular transfers when they earn more, but rather use additional income for expenses abroad while saving for lumpier investments and later requests from home. They pass through negative shocks immediately but absorb the windfalls. For their families in Fiji, where remittances are typically the primary and often only source of income (and consumption smoothing capacity limited), the welfare cost of earnings volatility abroad seems to be borne substantially back home. The minimum hours, pay, and deduction protections now in place under the PALM scheme

may thus be equally if not more important for remittance-receiving households in the Pacific than for the migrant workers themselves. Protecting the floor of PALM workers' earnings may protect the consumption floor in sending countries. As electronic transfer technologies continue to reduce the cost and time lags of remitting, the link between sender earnings volatility and receiver consumption volatility is likely to tighten further and make these dynamics more relevant over time.

We stress here that the income and expenditures we observe capture primarily cash flows. The extent to which non-cash consumption helps with smoothing is not clearly measured in our data, though anecdotal evidence from discussions with participants suggests these buffers exist but are limited and unreliable. On the issue of bi-directional risk-sharing, our qualitative transaction notes provide evidence of irregular specific requests from Fiji (e.g., for ceremonies, medical expenses, and school fees) but we do not have available to us analogous exogenous variation in Fiji to test this further.

Two additional limitations of our analysis here also suggest promising directions for future work. Financial diaries deliberately sacrifice cross-sectional breadth for individual depth on each participant over time, so we lack the statistical power to unpack potential heterogeneity, for example by gender or level of education. Since we only observe migrants and their families during their overseas work contract, we also cannot compare the volatility these households face to that of comparable non-migrant households. As negative shocks are immediately transmitted home, this is a first-order question.

Although the PALM scheme offers an exceptional opportunity to study the nexus of temporary migration and development, PALM migrants are different from those working in other countries or from other origin countries. The scheme is among the most regulated temporary migration schemes in the world, Australia as a migration destination has high minimum wages and a unique industrial relations system, and Pacific origin countries are themselves unique in ways which condition the welfare interpretations of our findings. In particular, the consumption floor for remittance-receiving households is relatively high by developing-country standards, and the persistent communal and informal economy may further cushion the impacts of negative shocks more than would be possible in, for

example, South Asia or Sub-Saharan Africa. The behavioural fundamentals we document here may thus generate more severe welfare consequences in corridors where receiving households have lower consumption floors and fewer non-cash resources to fall back on. Further analysis in other contexts is thus needed to see the extent to which the patterns we document here generalise to other settings. The fact that they are rationalised by standard economic theories of behaviour and consistent with several other key studies gives us some confidence that they will, but ultimately that is an empirical question. More broadly, our results here may be interpreted through the lens of intrahousehold bargaining in spatially separated households, a framework which applies to domestic and international migration alike and which, in our view, is a promising avenue for future work.

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Online Appendix for "Negative shocks travel home"—Not For Publication

Ryan Edwards and Estelle Stambolie, May 2026

Supplementary Appendix A. Data Appendix

A.1. Construction of the panel datasets for analysis

The main datasets (fortnightly and monthly, respectively) used for analysis in this paper were created from the cleaned data (cleaned by L-IFT and New York University, Financial Access Initiative) produced by the "FinBit" application. The process for creating these datasets included further cleaning: filtering out transactions before October 2022, an individual who did not have sufficient data, and an expense anomaly data point, which was a large medical cost that was paid out by insurance but only recorded as an expense in our dataset. The data also needed to have a date structure included for fortnightly and monthly analysis to transform it from transaction-level data. Income, expenses and remittances for individuals were summed at the fortnightly and monthly levels, and time periods where there was no transaction recorded were given zeros. Fortnights are two weeks[29] combined - Monday-Sunday, and months are determined by the month and year the transaction fell in. We then filtered out partial fortnights and months for individuals to allow comparability across time periods. Note we use calendar fortnight, not fortnight in study, which was a consideration with the rolling intake. Overall comparability of the same calendar fortnight is more desirable than time in the study since there was nothing significant about the entry time of the study.

A.2. Key variable definitions

Expenses. The expense variable in the data included remittances, and so an expenses (excluding remittances) variable was constructed by subtracting fortnight (or monthly) remittance from total expenses for individuals.

Remittances. The remittance variable was formed by taking all expenses where a remittance channel was recorded, constructing an indicator variable for these expenses as remittances, and then selecting these expense records out as a subset that are our remittance observations.

Income. The income measure we use has all recorded deductions added back into income reported since rent, insurance, superannuation, bills, etc. are commonly directly deducted from income, but are recorded under expenses so we can reconstruct the income. PALM employers often deduct some basic living expenses from paychecks, which they then organise and pay for these expenses directly; excluding them here

[29] Weeks are created with lubridate::isoweek in R which gives the week as it would appear in the ISO 8601 system (Grolemund and Wickham 2011; Spinu et al. 2024)

would understate income significantly. Since participants reported income that came into their bank account, this is likely the closest calculation possible to post-tax income. Note however that there are a minority of instances where there is tax included in the income measure we use (12/965 weekly income data points have tax included from adding deductions back in; we tested adjusting these to remove tax and results still hold). There are further cases where three individuals report "gross income" without reporting tax deductions in expenses. Since other deductions such as rent are reported, we assume that since no tax payments were subsequently recorded it was post tax 'gross income' being reported. Although the data likely has some noise due to different individuals reporting and receiving income with and without different deductions and we cannot ensure that all deductions are recorded in expenses, overall the income measure we have closely reflects the income received by participants into their bank accounts and we even out deduction disparities by adding deductions back in where possible.

Shocks. For positive and negative income shocks, binary indicator variables are constructed equal to 1 for a positive income shock if an individual's income in that time period was above their median for the study period, and zero otherwise, and the negative-shock indicator is set to 1 if the individual's income was below the median and zero otherwise. The median for those with an even number of fortnights of data is the average between the two centre figures. For shock intensity, we construct similar positive and negative indicators based on the absolute difference each fortnight between individual income and that individual's median income.

A.3. The scope of our remittances measure

Our remittance measure captures financial transfers sent through formal and informal financial channels. It does not capture three other forms of transfers that PALM workers also engage in, namely goods shipped home (which appear in our data as expenditures rather than remittances), goods carried home in person, and cash carried home in person. PALM workers typically use all of these channels, and understanding the scope of what our data capture (and what they do not) is important for interpretation.

For our sample of Fijian PALM-long workers, in-person transfers during the study period are likely to be small. Unlike short-term seasonal workers, long-stream participants return home infrequently (due to visa conditions and the cost of return travel). During our study period, three of our 29 workers travelled to Fiji (for leave or family reasons; two purchased housing materials while in Fiji). Beyond these direct in-person transfers, our transaction-level data also capture cash given to others to carry back and expenditure on goods destined for Fiji. Qualitative transaction descriptions record such transfers very rarely, suggesting that the missing channels constitute a trivial share of total outflows in

our sample—an important descriptive finding in its own right.

The most substantive form of other transfers we do not capture is accumulated savings intended for lump-sum transfer or to be taken home at the end of the contract. These savings appear in our data as the difference between earnings and expenditures each fortnight, not as remittances. As Table 1 shows, this residual is not trivial: the average PALM worker in our sample accumulates around AUD 918 per fortnight after subtracting remittances and other expenses from income. Some of this may be held as a buffer but much is almost certainly intended for eventual transfer or repatriation.

This important caveat matters more for interpreting the levels than for our main estimates. Our focus is the within-individual contemporaneous elasticity of financial remittances to earnings, and the individual fixed effect absorbs each worker's average propensity to save or remit in kind over the study period. What we miss is the lumpy end-of-contract transfer, which occurs outside our observation window. Future work tracking migrants through return and post-return, similar to that in the Pacific Labour Mobility Survey, will complement our analysis here.

A.4. Data quality

A.4.1. Phone-based data collection

Our use of phone-based data collection was driven by practical and logistical considerations. We prioritised the benefits of face-to-face for the Fijian household members, and allowed the migrant counterparts to be located anywhere in Australia rather than concentrated in one site. The onset of the COVID-19 pandemic during the design phase of the project also meant that phone surveys were quickly becoming more common globally, as they were often the only way to reach people, and much more is now known about their data quality properties.

The main concern with phone-based collection is the absence of in-person cross-checking against physical records, like receipts and bank statements. Our enumerators addressed this issue directly by (a) periodically requesting photographs of bank statements and mobile money transaction records, as an important quality check, and (b) building sustained rapport, through repeated weekly contact with the same enumerator, over the course of the study. Beegle et al. (2012) show that diary-based methods, even when implemented remotely, can produce more accurate consumption data than recall-based surveys, while Dabalen et al. (2016) and Gourlay et al. (2021) show that repeat phone contact with trusted enumerators substantially reduces the measurement gap relative to in-person interviews.

A.4.2. Participant fatigue

As financial diaries involve sustained engagement over many weeks, a legitimate concern is that data quality may decline over time as respondents tire of repeated interviews. Several features of our data collection approach mitigate this risk. One, each weekly interview was short, between 15 and 30 minutes. Two, the same enumerator spoke with the same pair throughout the study, lowering rapport costs after the first few weeks. Three, participants received modest incentives and a phone for data entry, which our endline survey showed was highly valued by participants (and thus a "high-powered" incentive). Finally, examining the data directly for evidence of fatigue effects, in Appendix Figure A3, where we plot the variance of reported transactions against time in study for each participant, we find no systematic secular trends in either. This suggests that quality did not deteriorate over time.

A.4.3. Measurement error

Measuring remittances accurately is known to be difficult (De Arcangelis et al. 2023). Standard surveys typically rely on recall periods that amplify recall error, while administrative data, typically from single financial institutions, miss transfers not made through these institutions (McKenzie and Mistiaen 2009). Comola and Fafchamps (2017) and Gibson and McKenzie (2017) show how reported remittance amounts can diverge depending on who reports, transfer frequency, and the particular recall burden on respondents, finding that small and irregular transfers are especially prone to under-reporting.

Three features of our data collection approach address these issues. First, the weekly recall window is much shorter than those used in standard household surveys, reducing recall error by construction and mechanically. Second, as our sample is selected on the migrant, rather than on a single financial services provider, we capture transactions across all accounts held by migrants and households. This is an important advantage here, as most migrants hold multiple accounts and use multiple remittance channels. Third, the transaction-level detail captured by the customised FinBit software allows us to classify each outward transfer by modality, timing, and recipient—along with descriptive labels—which, in principle, enables cross-checking against remittance inflows on the receiving side.

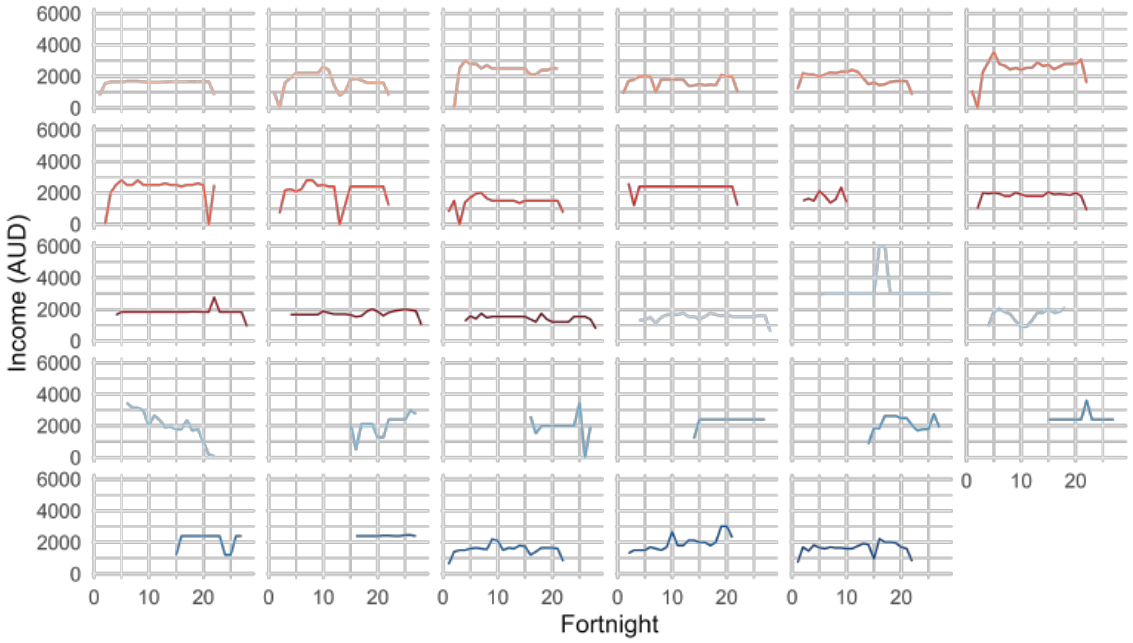
While these features cannot eliminate measurement error, they should work together to reduce it. Any residual classical measurement error will likely attenuate estimates toward zero. In contrast, non-classical measurement error—for example, the systematic under-reporting of small or irregular transfers—could bias estimates in either direction and cannot be ruled out.

A.4.4. Dyadic validation

The dual-sided nature of our data allows us to cross-check sender-reported outward remittance transfers against receiver-reported remittance inflows, within each pair. This validation exercise is similar in spirit to that in Gibson and McKenzie (2017) except using high-frequency transaction data, rather than a larger cross-section. For each fortnight-pair, Appendix Figure A11 plots sender-reported remittance amounts against receiver-reported amounts. The correspondence is generally good. The obvious differences arise when minority ad-hoc transfers to/from non-main receivers/senders occur. Once anomalies are accounted for, the shapes of the series largely match each other.

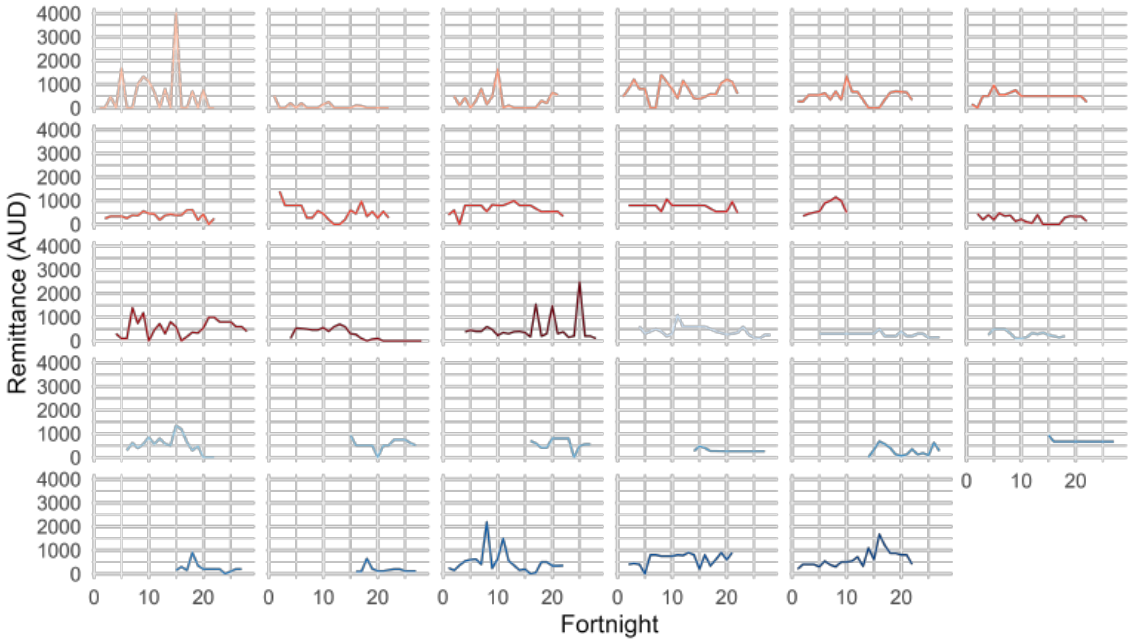
Supplementary Appendix B. Additional Figures

FIGURE A1. MIGRANT INCOMES—INDIVIDUAL TIME SERIES



Notes: This figure plots each individual income time series shown in Panel A of Figure 1 in the main paper, specifically plotting the individual fortnightly income time series separately, by calendar fortnight (cf. fortnight in study, which differs by individual due to the rolling intake).

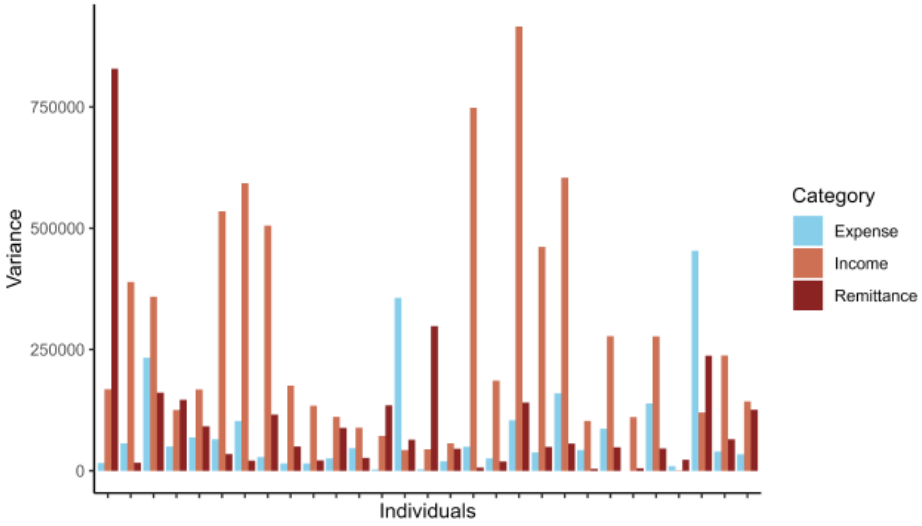
FIGURE A2. MIGRANT REMITTANCES—INDIVIDUAL TIME SERIES



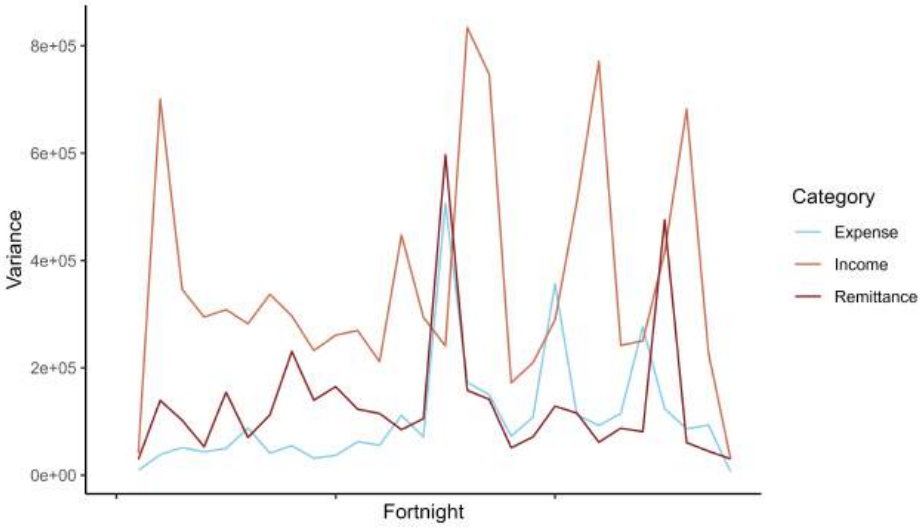
Notes: This figure plots each individual remittance time series shown in Panel B of Figure 1 in the main paper, specifically plotting the individual fortnightly remittance time series separately, by calendar fortnight (cf. fortnight in study, which differs by individual due to the rolling intake).

FIGURE A3. RESPONSE VARIANCE ACROSS MIGRANTS AND FORTNIGHTS

A. Migrant response variance across all fortnights

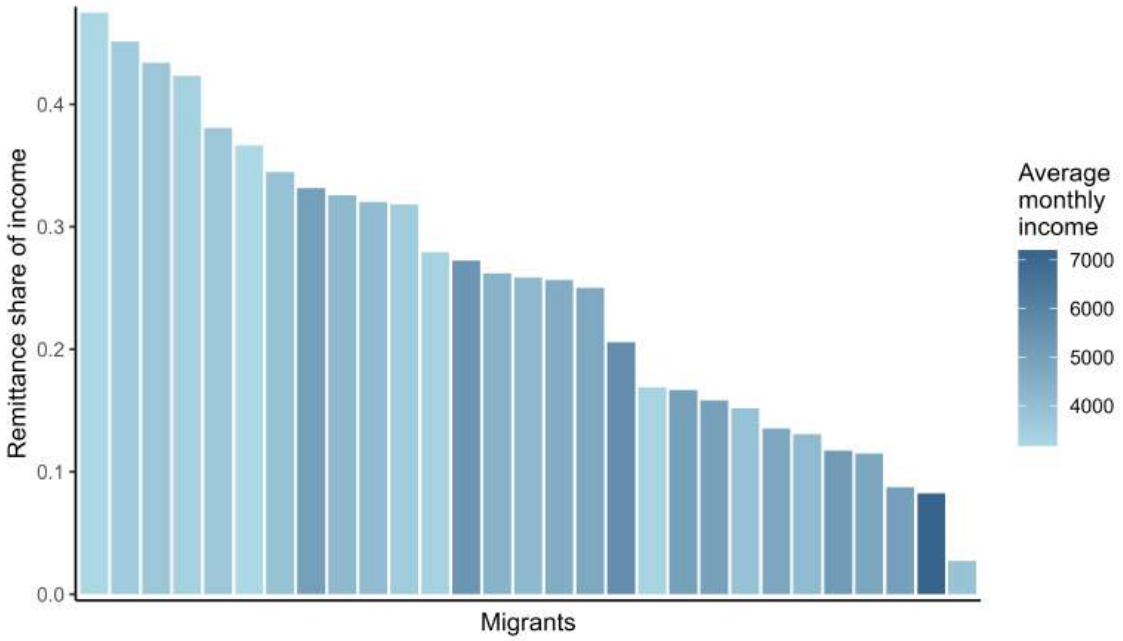


B. Migrant response variance per fortnight across all migrants in sample in that period



Notes: Panel A plots each migrant's variance per category over all time periods. Panel B plots the variance of responses in a given fortnight for the migrants that were in the sample (rolling recruitment) in that period. There is no clear evidence of any problematic underlying systematic trends in either.

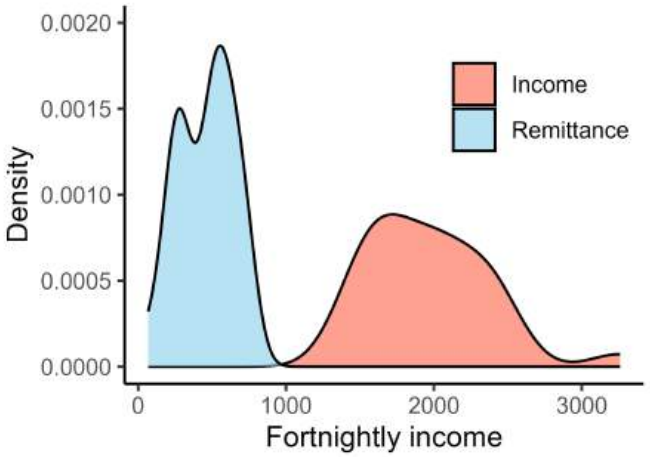
FIGURE A4. REMITTANCE SHARE OF INCOME, MONTHLY



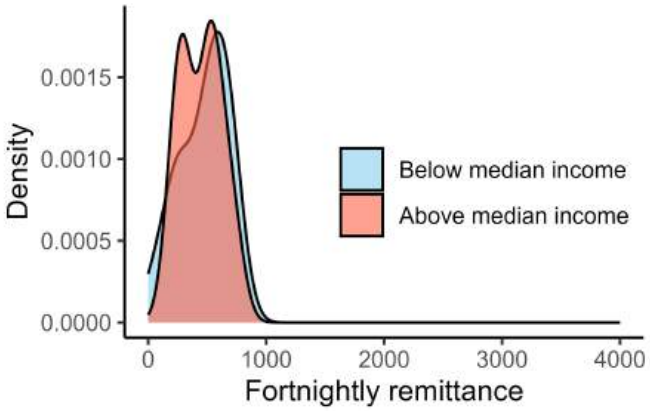
Notes: This graph shows the monthly average remittance as a share of income for migrant PALM-long workers in our sample. There is substantial variation among migrants of how much of their income they send home, from below 10 percent to above 40 percent.

FIGURE A5. INCOME AND REMITTANCE DISTRIBUTIONS

A. Migrant average income and remittance distributions



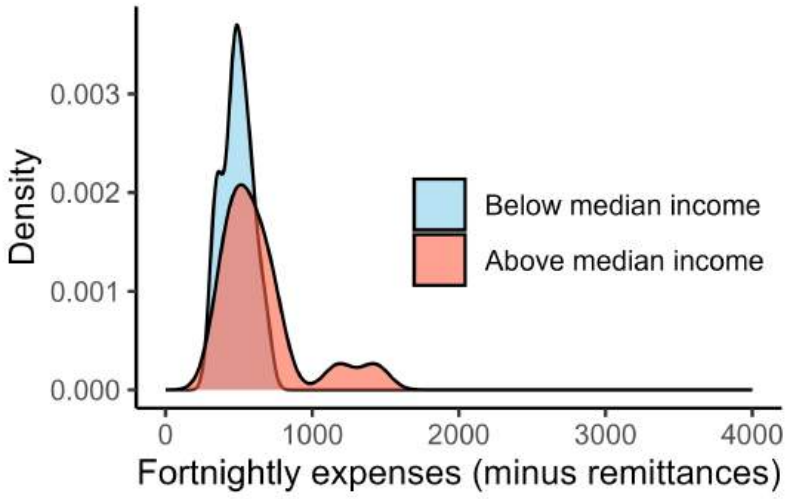
B. Migrant average remittances by income level



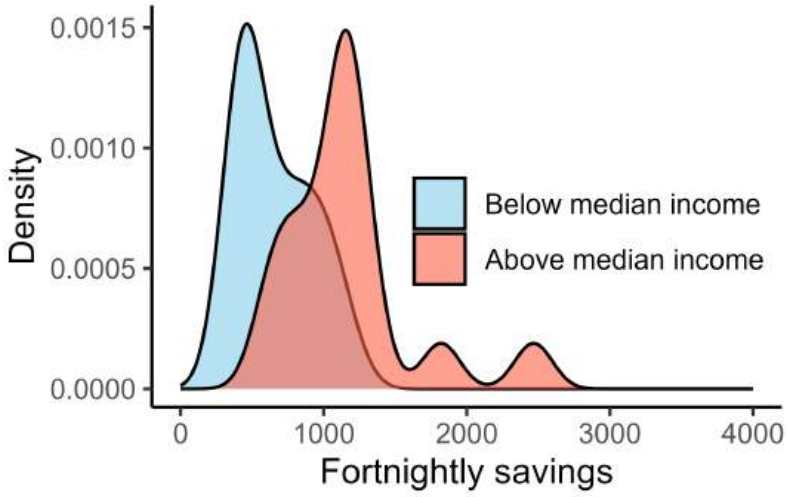
Notes: These figures plot the cross-sectional equivalent, taken as each migrant's average over all time periods, of Panels A and B in Figure 2 in the main paper. For the migrant average we can be confident that the distribution of those above median income and those below median income is not statistically different. As the exact two-sample Kolmogorov-Smirnov test gave results showing that their distributions are very similar, as the kernel density plot shows. The results were D = 0.21154, and a p-value of 0.8218, thus we fail to reject the null hypothesis that the two samples come from the same distribution. There is no evidence that the distributions of above median income earners' remittances and below median income earners' remittances differ.

FIGURE A6. DISTRIBUTIONS OF FORTNIGHTLY EXPENSES AND SAVINGS

A. Expenses by Income Level

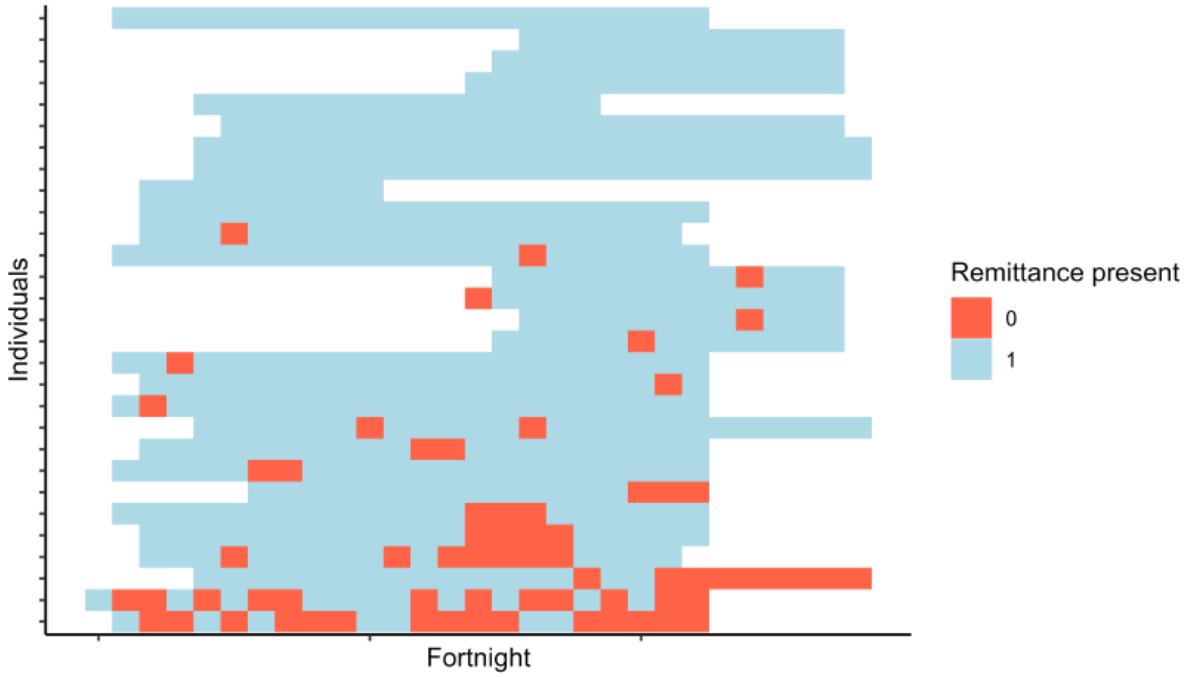


B. Savings by Income Level



Notes: These figures plot the cross-sectional equivalent, taken as each migrant's average over all time periods, of Panels A and B in Figure 3 in the main paper. Panel A plots the kernel density estimates of average migrant fortnightly expenses (excluding remittances), split by whether the migrant, on average across all weeks, earned above or below the median average income for the sample. Panel B plots average migrant fortnightly savings (income minus expenses), split by whether the migrant, on average across all weeks, earned above or below the median average income.

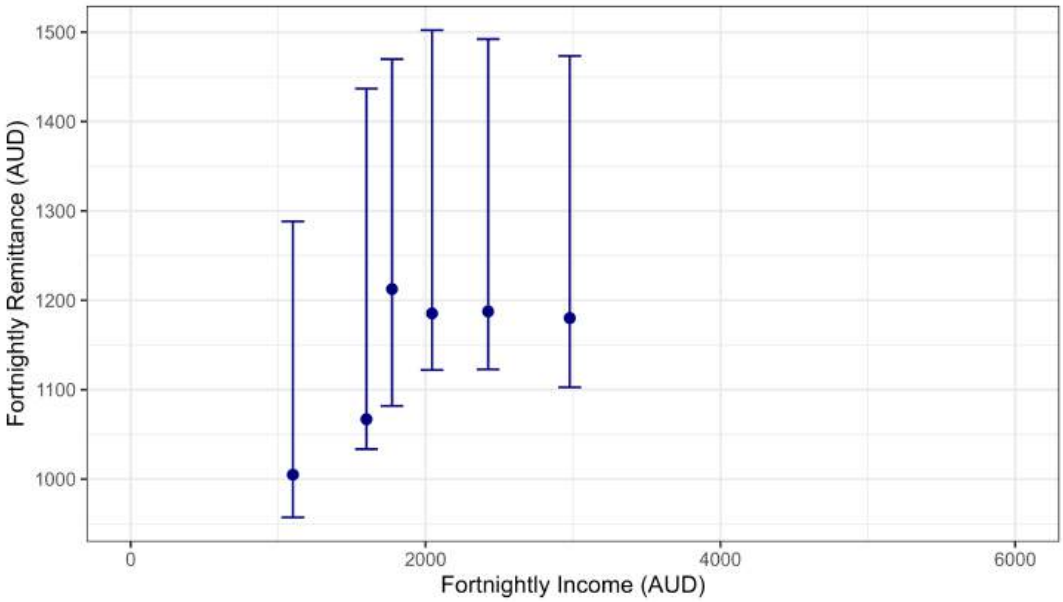
FIGURE A7. ZERO VALUES ACROSS INDIVIDUALS AND TIME



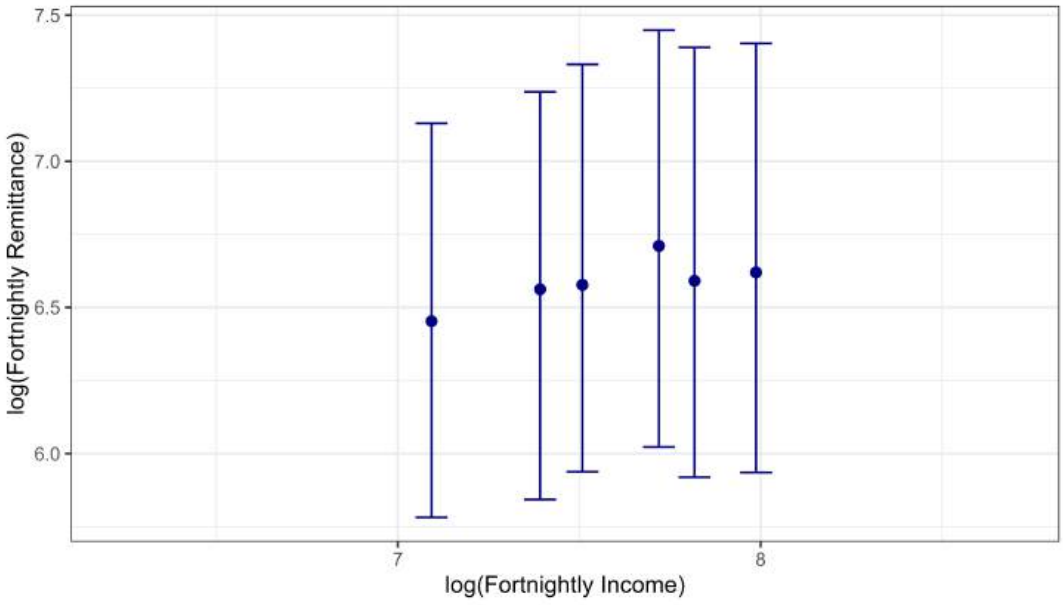
Notes: This heatmap shows fortnights where individuals have zero remittances recorded. The white space indicates when the individual was not in the study, and the transition to blue in each row when they joined via the rolling recruitment. While most participants send regular remittances, a few individuals (at the bottom of the heat map) clearly send more irregularly.

FIGURE A8. BINNED SCATTER PLOTS, LEVELS VS. LOGS

A. Level-level functional form

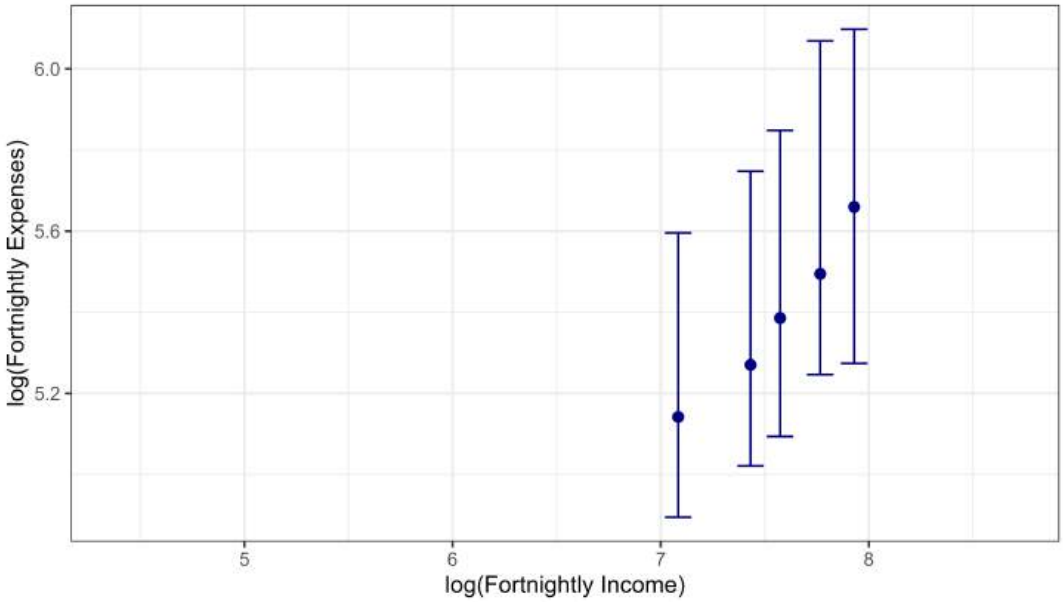


B. Log-log functional form



Notes: These figures show binned scatter plots regressing level fortnightly migrant remittances on level income with individual and time fixed effects in Panel A, and the log-log equivalent in Panel B. Standard errors are adjusted for arbitrary heteroskedasticity.

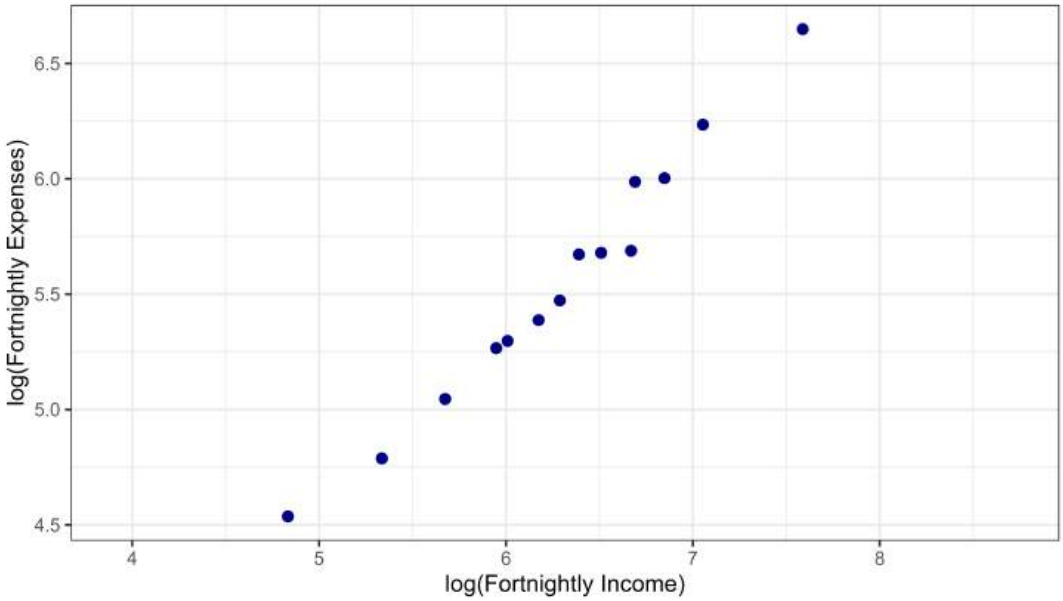
FIGURE A9. BINNED SCATTER PLOT, MIGRANT EXPENSES, LOG-LOG



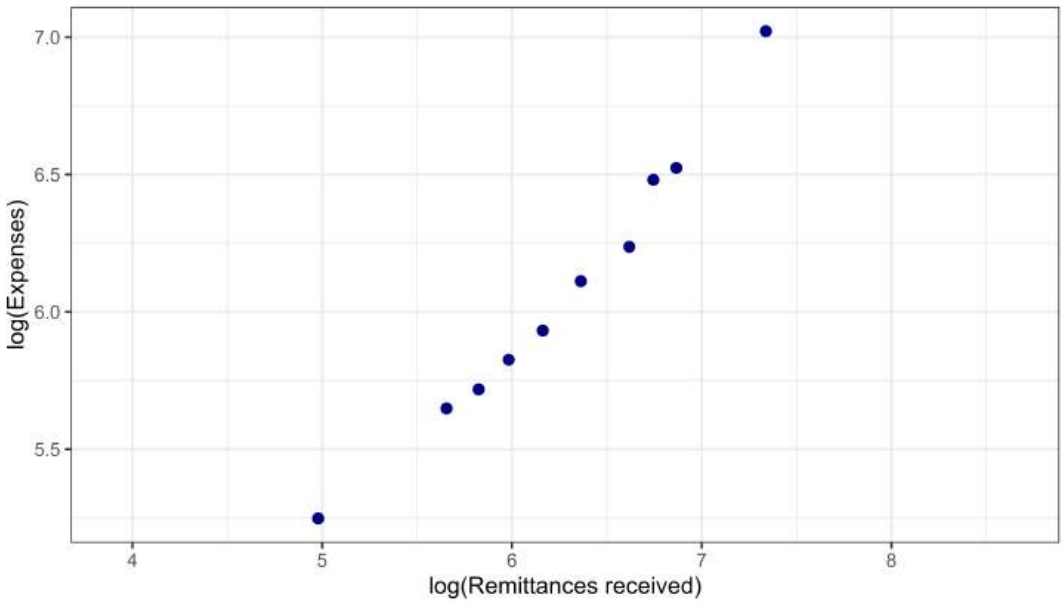
Notes: This figure shows the binned scatter plot regressing log migrant fortnightly expenses on log income with individual and time fixed effects. Standard errors are adjusted for arbitrary heteroskedasticity.

FIGURE A10. BINNED SCATTER PLOTS, FIJIAN REMITTANCE RECEIVERS

A. Level-level functional form

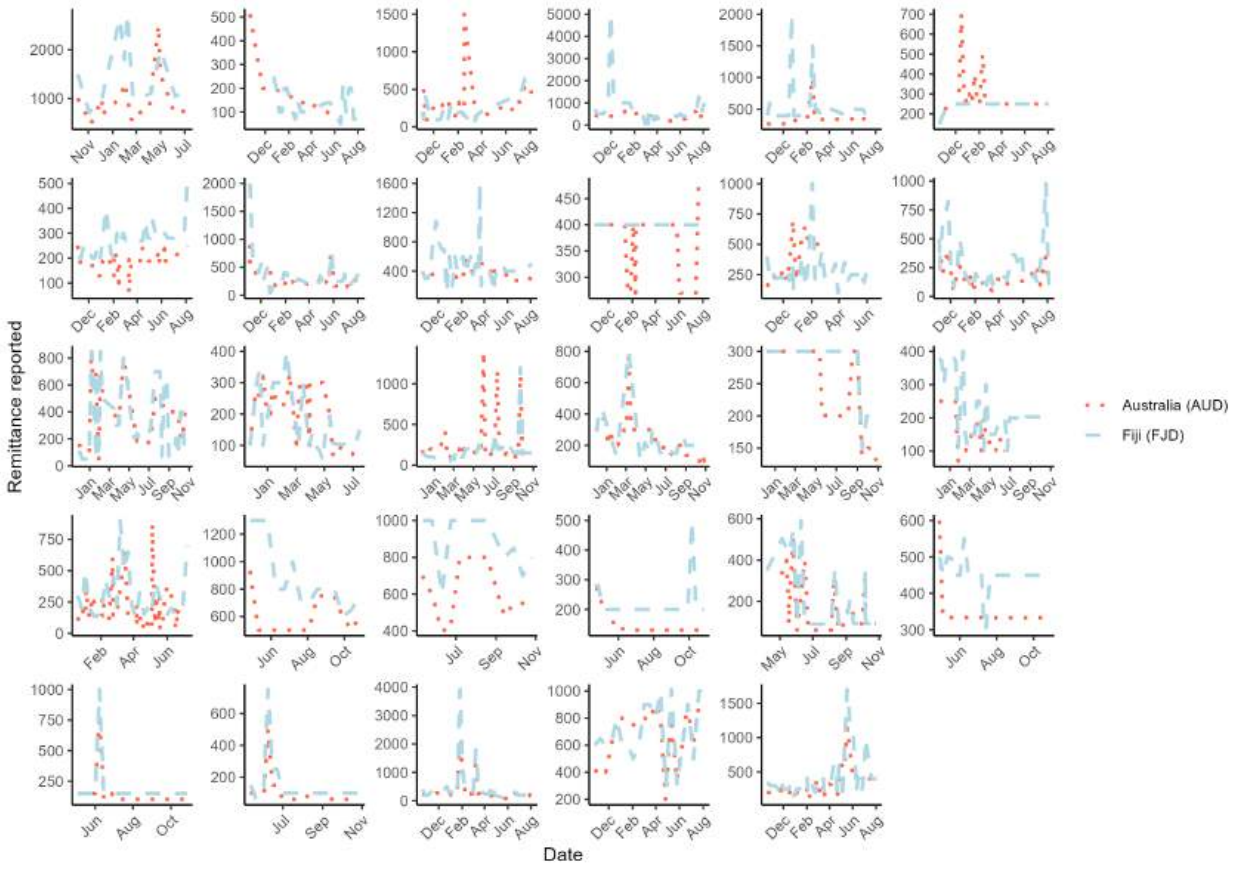


B. Log-log functional form



Notes: These figures show binned scatter plots regressing log fortnightly Fijian expenses on log income with individual and time fixed effects in Panel A, and log fortnightly Fijian expenses on log remittances received in Panel B.

FIGURE A11. REMITTANCE REPORTING—DYADIC VALIDATION



Notes: This figure plots individual remittance transactions recorded by sender and receiver pairs in their respective currencies. For dyadic validation the shape of lines should be considered, not the levels. Differences across the pair's series can often be attributed to senders sending to other recipients and receivers receiving from other sources, or in two instances receivers reporting for longer time periods than migrants. There are also some unexplained records on remittances on one side not picked up on the other, however these could be to/from different people without recording this. The series largely match each other once the anomalies are accounted for.

Supplementary Appendix C. Additional Tables

TABLE A1. REMITTANCE ELASTICITIES, REMITTANCE SENDERS, LEVELS

Dependent Variable	Remittance					
	Fortnightly data			Monthly data		
Column	(1)	(2)	(3)	(4)	(5)	(6)
Income	0.1197***	0.1010***	0.183***	0.1297***	0.1174***	0.369***
	(0.0270)	(0.0289)	(0.042)	(0.0352)	(0.0410)	(0.112)
lag(remittance, 1)			0.013			0.145
			(0.089)			(0.092)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE		Yes			Yes	
SGMM			Yes			Yes
Observations	556	555	556	239	238	239
Instruments used			5			5
SGMM test results:			*Fortnightly*	*(p value)*	*Monthly*	*(p value)*
Sargan test: chisq(2)			2.996	(0.560)	4.072	(0.396)
Autocorrelation test (1): normal			-2.040	(0.041)	-2.650	(0.008)
Autocorrelation test (2): normal			0.174	(0.862)	1.361	(0.173)
Wald test for coefficients: chisq(2)			21.703	(0)	19.820	(0)

Notes: Regressions of level fortnightly (Columns 1–3) and monthly (Columns 4–6) remittances on level fortnightly and monthly income, detailed in Equation 1. The estimation sample is a panel of 29 Fijian PALM workers observed fortnightly/monthly for between 5–12 months. Columns 2 and 5 use a standard two-way fixed effects estimator, with fixed effects for every individual migrant and calendar fortnight/month (cf. fortnight in study, which does not align with calendar fortnights due to the rolling intake). Columns 3 and 6 report instrumental variable estimates based on a system generalised method of moments exploiting lags in levels and differences similar to the estimations in the main paper to the second and third order. Cluster-robust standard errors are in parentheses and stars denote statistical significance at the 10, 5 and 1 percent levels.

TABLE A2. EXPENDITURE ELASTICITIES, REMITTANCE SENDERS, LEVELS

Dependent Variable	Expenses					
	Fortnightly data			Monthly data		
Column	(1)	(2)	(3)	(4)	(5)	(6)
Income	0.1472***	0.1056**	0.156***	0.1119**	0.1182***	0.092
	(0.0413)	(0.0409)	(0.048)	(0.0415)	(0.0423)	(0.079)
lag(expenses, 1)			0.226**			0.413***
			(0.088)			(0.102)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE		Yes			Yes	
SGMM			Yes			Yes
Observations	556	555	556	239	238	239
Instruments used			5			7
SGMM test results:			*Fortnightly*	*(p value)*	*Monthly*	*(p value)*
Sargan test: chisq(2)			5.248	(0.263)	1.697	(0.791)
Autocorrelation test (1): normal			-2.011	(0.044)	-3.578	(0.000)
Autocorrelation test (2): normal			1.127	(0.260)	1.213	(0.225)
Wald test for coefficients: chisq(2)			33.322	(0)	31.326	(0)

Notes: Regressions of level fortnightly (Columns 1–3) and monthly (Columns 4–6) expenditures on level fortnightly and monthly income, detailed in Equation 1. The estimation sample is a panel of 29 Fijian PALM workers observed fortnightly/monthly for between 5–12 months. Columns 2 and 5 use a standard two-way fixed effects estimator, with fixed effects for every individual migrant and calendar fortnight/month. Columns 3 and 6 report instrumental variable estimates based on a system generalised method of moments exploiting lags in levels and differences similar to the estimations in the main paper to the second and third order. Cluster-robust standard errors are in parentheses and stars denote statistical significance at the 10, 5 and 1 percent levels.

TABLE A3. REMITTANCE ELASTICITIES USING WEEKLY DATA, REMITTANCE SENDERS

Dependent Variable	Log (remittance)		Remittance	
Column	(1)	(2)	(3)	(4)
Log (income)	0.1964	0.2157		
	(0.2365)	(0.2829)		
Income			0.1311**	0.1261*
			(0.0518)	(0.0664)
Individual FE	Yes	Yes	Yes	Yes
Time FE		Yes		Yes
Observations	615	615	760	759

Notes: Column 1–2 show regressions of log weekly remittances on log weekly income, for remittance senders in Australia, and Column 3–4 show the level equivalents. Column 1 and 3 have individual fixed effects, and Column 2 and 4 have individual and time fixed effects, similar to Equation 1. This sample is cut to the 23 study participants that are paid weekly. The number of observations is higher because the data is more fine grained at the weekly level, however it also means that more weeks are dropped in the log-log regression because many weeks have 0 remittances. Cluster-robust standard errors are in parentheses and stars denote statistical significance at the 10, 5 and 1 percent levels.

TABLE A4. PPML REMITTANCE ELASTICITIES, REMITTANCE SENDERS

	Fortnightly data		Monthly data	
Panel A: Remittances				
log (income)	0.6122***	0.4997**	0.6159***	0.6016***
	(0.1508)	(0.1993)	(0.1316)	(0.1476)
Panel B: Expenses (other than remittances)				
log (income)	0.5714***	0.4185***	0.3989***	0.3864***
	(0.1233)	(0.1253)	(0.1403)	(0.1452)
Individual FE	Yes	Yes	Yes	Yes
Time FE		Yes		Yes
Observations	547	547	239	238

Notes: Regressions of fortnightly/monthly remittances (Panel A) and expenses other than remittances (Panel B) on log fortnightly/monthly income, detailed in Equation 1, for remittance senders, estimated via Poisson pseudo-maximum likelihood (PPML). The estimation sample is a panel of 29 Fijian PALM workers observed weekly (and aggregated to the fortnight here) for between 5–12 months. Columns 2 and 4 use a two-way fixed effects-type PPML estimator, with fixed effects for every individual migrant and calendar fortnight/month. Cluster-robust standard errors are in parentheses and stars denote statistical significance at the 10, 5 and 1 percent levels.

TABLE A5. PPML EXPENDITURE ELASTICITY ESTIMATES, REMITTANCE RECEIVERS

Dependent Variable	Expenses			
Column	(1)	(2)	(3)	(4)
log (remittances)	0.9270***	0.8889***	0.7391***	0.7036***
	(0.0754)	(0.0616)	(0.0777)	(0.0717)
Observations	510	509	232	232
log (income)	1.023***	0.9989***	0.8660***	0.8609***
	(0.0806)	(0.0668)	(0.1006)	(0.0886)
Observations	537	536	234	234
Individual FE	Yes	Yes	Yes	Yes
Time FE		Yes		Yes

Notes: Regressions of fortnightly/monthly remittances (Panel A) and expenditures (Panel B) on log fortnightly/monthly income, detailed in Equation 1, for remittance receivers, estimated via Poisson pseudo-maximum likelihood (PPML). The estimation sample is a panel of 29 remittance-receiving households in Fiji observed fortnightly for between 5–12 months. Columns 2 and 4 use a two-way fixed effects-type PPML estimator, with fixed effects for every individual migrant and calendar fortnight/month. Cluster-robust standard errors in parentheses; stars denote statistical significance at the 10, 5 and 1 percent levels.

TABLE A6. INCOME RESIDUALS, REMITTANCE SENDERS

Dependent Variable	Residual income	
Column	(1) Fortnightly	(2) Monthly
Constant	0.0027	-0.0003
	(0.0070)	(0.0067)
Lag residual income	0.4957**	0.0050
	(0.2062)	(0.0813)
Observations	512	209

Notes: This table reports the autocorrelation of income residuals, where the residuals are derived from a two-way fixed effects specification. Cluster-robust standard errors in parentheses. Stars denote statistical significance at the 10, 5 and 1 percent levels.

TABLE A7. ASYMMETRIC REMITTANCE RESPONSES, REMITTANCE SENDERS, LEVELS

Dependent variable	Remittances					
	Fortnightly data			Monthly data		
Column	(1)	(2)	(3)	(4)	(5)	(6)
Positive shock (=1)	26.69		-31.48	23.94		-11.68
	(39.24)		(36.94)	(95.64)		(126.3)
Negative shock (=1)		-70.32*	-90.53**		-45.67	-53.49
		(37.91)	(37.57)		(86.17)	(114.2)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	555	555	555	238	238	238

Notes: Regressions of dichotomous treatment indicators reflecting whether a fortnight-migrant income observation is above or below that migrant's median income over the study period on remittance levels, similar to Equation 1. The estimation sample is a panel of 29 Fijian PALM workers observed fortnightly for between 5–12 months. Cluster-robust standard errors are in parentheses and stars denote statistical significance at the 10, 5 and 1 percent levels.

TABLE A8. ASYMMETRIC EXPENDITURE RESPONSES, REMITTANCE SENDERS, LEVELS

Dependent variable	Expenses					
	Fortnightly data			Monthly data		
Column	(1)	(2)	(3)	(4)	(5)	(6)
Positive shock (=1)	80.13		174.7**	221.0***		347.1**
	(47.98)		(67.97)	(60.10)		(133.5)
Negative shock (=1)		35.02	147.2		-45.33	194.0
		(105.3)	(134.8)		(157.9)	(234.3)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	555	555	555	225	225	225

Notes: Regressions of dichotomous treatment indicators reflecting whether a fortnight-migrant income observation is above or below that migrant's median income over the study period on expenditure levels, similar to Equation 1. The estimation sample is a panel of 29 Fijian PALM workers observed fortnightly for between 5–12 months. Cluster-robust standard errors are in parentheses and stars denote statistical significance at the 10, 5 and 1 percent levels.

TABLE A9. ASYMMETRIC REMITTANCE RESPONSES, PPML, REMITTANCE SENDERS

Dependent variable	remittance					
Column	(1)	(2)	(3)	(4)	(5)	(6)
Positive shock (=1)	0.0915	0.0710			-0.0670	-0.0410
	(0.0681)	(0.0839)			(0.0684)	(0.0786)
Negative shock (=1)			-0.2120***	-0.1553*	-0.2531***	-0.1819**
			(0.0724)	(0.0840)	(0.0837)	(0.0833)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE		Yes		Yes		Yes
Observations	556	555	556	555	556	555

Notes: This table shows Poisson Pseudo Maximum Likelihood (PPML) regressions of dichotomous treatment indicators reflecting whether a fortnight-participant income observation is above or below that participant's median income over the study period on remittances. The estimation sample is a panel of 29 Fijian PALM workers observed fortnightly for between 5–12 months. Cluster-robust standard errors are in parentheses and stars denote statistical significance at the 10, 5 and 1 percent levels.

TABLE A10. ASYMMETRIC REMITTANCE RESPONSES, WEEKLY DATA, SENDERS, LEVELS

Dependent variable	Remittances		
Column	(1)	(2)	(3)
Positive income shock (=1)	5.527		-35.12
	(24.53)		(33.67)
Negative income shock (=1)		-43.28	-65.15*
		(28.14)	(32.12)
Individual FE	Yes	Yes	Yes
Time FE		Yes	Yes
Observations	760	759	759

Notes: This table shows regressions of dichotomous treatment indicators reflecting whether a week-participant income observation is above or below that participant's median income over the study period on remittances. This sample is cut to the 23 study participants that are paid weekly. The number of observations is higher because the data is more fine grained at the weekly level. Cluster-robust standard errors are in parentheses and stars denote statistical significance at the 10, 5 and 1 percent levels.