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The COVID-19 pandemic, remittances and financial inclusion in the Philippines

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Recent literature has revealed that financial inclusion enhances economic opportunities and security in developing countries. Moreover, a greater inflow of remittances can promote inclusiveness. In this paper, we explore the potential impacts of the COVID-19 outbreak on financial inclusion by focusing on its detrimental effect on remittance flows to developing countries. Using a household-level dataset collected in rural regions of the Philippines prior to the outbreak, we confirm that remittances are associated with financial inclusion, particularly for women. We discuss the potential impacts of the pandemic on financial inclusion through the change in the flow of remittances. We show that a substantial decline in remittances caused by the COVID-19 crisis may have an adverse effect on financial inclusion in the Philippines.

JEL classification: F22. F24, F36, G21, O16
Keywords: financial inclusion, SDGs, COVID-19, remittance, migration, Philippines

1. Introduction

Financial inclusion that promotes access to and use of the formal financial services that are available to any individual is an essential element in improving economic opportunity and security, which is particularly beneficial to women and impoverished adults [Demirgüç-Kunt et al. 2017]. This issue has gained importance particularly in developing countries and is well acknowledged by both academics and policymakers. In fact, the Sustainable Development Goals (SDGs) aim to "[s]trengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance, and financial services for all".[1] However, the current state of access to financial services remains disappointing. While on

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[1] The target is stated in Target 8.10. The United Nations Capital Development Fund (UNCDF) states that financial inclusion also supports eight out of the seventeen Sustainable Development Goals (https://www.uncdf.org/financial-inclusion-and-the-sdgs). Also see Klapper et.al [2016].

average, financial inclusion progressed from 51 percent to 69 percent between 2011 and 2017 in terms of the proportion of the "banked" who hold an account at a financial institution or with a mobile money provider, approximately 1.7 million adults worldwide remained "unbanked" [Global Findex Report 2017][2]. In 2017, the proportion of the "unbanked" was disproportionally higher at 63 percent in low- and middle-income countries with a wide variation across countries and individuals. This is in contrast to the virtually universal possession in high-income countries (94 percent).

Financial inclusion promotes the availability of a variety of financial products such as payment services, savings accounts, loans, and insurance for individuals, and benefits them by mitigating poverty through consumption smoothing, productive investment, and financial risk management (Karlan et al. [2016]; Demirgüç-Kunt et al. [2017]). To expand financial inclusion, governments can take initiatives in developing financial markets, specifically by switching from cash to digital payments for wages and pensions. Furthermore, recent literature has underscored the role of remittances in promoting financial inclusion; remittances may have a positive impact on financial inclusion by increasing the demand for saving instruments as a means of storing excess cash or they may make loan conditions more relaxed by serving as collateral. Moreover, those transactions may further mitigate asymmetry in the information available to financial institutions and enhance financial knowledge within households (Anzoategui et al. [2014]; Aga and Martínez Pería [2014]). The movement in this direction is also reinforced by the fact that remittance inflow to low- and middle-income countries has been growing steadily over three decades to reach an estimated 714 trillion US dollars in 2019, which surpassed both Official Development Assistance (ODA) and Foreign Direct Investment (FDI) [World Bank 2020b].

The outbreak of the COVID-19 pandemic is a serious concern due to the negative impact it will have on financial inclusion by reversing the expanding trend of remittance inflows. As 80 percent of the world's total remittances flowed to low- and middle-income countries in 2019, the pandemic is expected to substantially reduce the remittances that migrants from developing countries can send home [World Bank 2020b]. The World Bank reports that remittances to low- and middle-income countries are likely to fall by 19.7 percent in 2020 (a 13 percent decline in East Asia and the Pacific region), which would be the sharpest global decline in recent history.[3] According to the central bank of the Philippines, the inflow of remittances sent by overseas Filipino's started to decline from March 2020.[4] In response, the Philippine Government began to release 200 US dollars as cash relief to distressed overseas Filipino workers (OFW).[5] Indeed, severe economic downturns in destination countries under a lockdown or due to

[2] Demirgüç-Kunt et al. [2018].
[3] World Bank [2020c].
[4] Bangko Sentral ng Pilipinas [n.d.].
[5] Cash relief is delivered to the affected migrants and their families in Davao del Sur under the initiative of Overseas Workers Welfare Administration (OWWA).

oil price crashes are reducing job opportunities and lowering wages for migrants [IOM 2020]. Even if migrants retain jobs in their host countries, they may find it difficult to send their remittances back home where there are severe restrictions on movement and tight regulations on money transfer services [World Bank 2020a]. Moreover, many migrants who had prepared themselves for impending migration were forced to stay in their home countries, with some discouraged from migrating entirely and forced to change their livelihood.

This paper examines the relationship between remittance and financial inclusion and discusses the potential impacts of the COVID-19 pandemic on household financial inclusion in the Philippines—a country that is heavily dependent on remittances. The Philippines is one of the largest source countries for migrants and one of the most remittance-dependent countries in the world [Yang 2011]. The number of overseas Filipino workers was estimated at 2.2 million in 2016 and the remittance inflow to the Philippines was 35,167 million US dollars in 2019, which ranked the country fourth in the world for remittance inflow [World Bank 2020b].[6] The proportion of remittances relative to the GDP of the Philippines was high at 9.9 percent. Moreover, some of the destination countries accepting Filipino migrants are those most seriously damaged by lockdowns and oil price crashes during the COVID-19 pandemic. In 2016, the top destinations for Filipino migrant workers included Saudi Arabia, the United Arab Emirates, Kuwait, Qatar, Hong Kong, and Singapore, which combined accounted for two-thirds of the total destinations [Philippine Statistics Authority 2017].[7] Furthermore, the Philippines holds a unique position in the trend of financial inclusion in terms of gender inequality; the proportion of the "unbanked" is smaller for women than men by more than 10 percentage points [Global Findex Report 2017]. Therefore, it is important to examine the relationship between remittances and women's financial inclusion and the potential impact of the COVID-19 pandemic on their financial inclusion.

In this paper, we utilize a household-level dataset that was collected in two rural municipalities in the Philippines. One of the advantages of using household-level data is that it addresses heterogeneity in household characteristics and the diversity of migrant destinations among Filipino migrants. We first pin down the empirical relationship between remittance income and financial inclusion by two-stage least squares (2SLS) instrumenting remittance income by macroeconomic variables exogenous to households. We then discuss the potential impacts of the pandemic on financial inclusion through the change in the flow of remittances using the revision of the 2020 GDP forecasts by the International Monetary Fund (IMF) and the World Bank, which were made before and after the outbreak of the COVID-19 pandemic. We show that a substantial decline in remittances due to the COVID-19 crisis may have an adverse effect on financial inclusion in the Philippines.

[6] The amount of remittance inflow in 2019 was the largest in India (83,131 million US dollars, 2.8 percent of GDP), followed by China (68,398 million US dollars, 0.5 percent of GDP) and Mexico (38,520 million US dollars, 3.0 percent of GDP).

[7] The Stock Estimate of Overseas Filipinos (Commission on Filipinos Overseas 2013) shows that the top five destination countries were the U.S., followed by Saudi Arabia, the UAE, Malaysia and Canada.

This paper proceeds as follows: Section 2 provides a brief survey of the literature on remittances and financial inclusion. Section 3 then describes the dataset used in this study. Section 4 investigates the relationship between remittance income and financial inclusion through macroeconomic variables before the COVID-19 outbreak. Section 5 discusses the impact of the pandemic on household financial inclusion and Section 6 presents the conclusions.

2. Previous literature

There has been a large volume of literature on remittances and their impact on development [Neceur et al. 2020].[8] In this section, we confine the literature survey to remittances and financial inclusion using household-level data, while we acknowledge that the relationship between remittances and financial inclusion has also been extensively examined using cross-country data.[9]

To our knowledge, the literature on remittances and financial inclusion using household-level data is relatively new. One of the early papers is Anzoategui et al. [2014] which examined the relationship between remittances and financial inclusion using household-level data in El Salvador. Employing instrumental variable estimation, they found that remittances have a positive impact on financial inclusion in terms of the use of deposit accounts but do not have a significant effect on demand or use of formal credits. They discussed the fact that the obscure impact on credits is attributed to two opposite forces; remittance serves as collateral for financial institutions to provide credit while remittances relax the credit constraints on households.[10] Aga and Martínez Pería [2014] also found that remittances enhance the probability of a household opening up a bank account in five Sub-Saharan African countries, which is confirmed by employing a two-stage least squares (2SLS) estimation using the macroeconomic performance of the destination countries as an instrumental variable. Moreover, Ambrosius and Cuecuecha [2016] examined the effect of remittances on the use of financial services both formal and informal, and found that remittances have a positive impact on the ownership of savings accounts; this has been repeatedly confirmed in subsequent papers.[11] The authors also found that remittances do not facilitate the taking on of loans from formal financial institutions but rather from informal sources, implying that remittances are not necessarily a substitute for but rather a complement to lending through undeveloped bank loans.

[8] There is a large body of literature on the impact that remittances have on development, which covers economic growth, poverty, education, labor supply, health and entrepreneurship. There is also a large volume of work on remittances and financial development (financial depth), which is different but close to financial inclusion, that uses macro-level data to shows that remittances are likely to encourage financial development [Demirguc-Kunt et al. 2016].

[9] Empirical papers using cross-country data include Aggarwal et al. [2011], Inoue and Hamori [2016], Tu et al. [2019], and Neceur et al. [2020].

[10] Substitution between remittances and receiving credit is further examined by Ambrosius and Cuecuecha [2013] who claimed that remittances are financing household emergencies and are less dependent on debt financing in response to negative health events.

[11] An exception is Brown et. al. [2013] which showed that remittances have either a negative or little effect on the propensity of individuals to have a bank account in Azerbaijan and a positive but small effect in Kyrgyzstan.

Overall, there is a consensus among the various papers on financial inclusion using household-level data that remittances have a positive impact on the propensity of individuals to hold a savings account, while empirical results are mixed on the impact of remittances on credits/loans.[12]

3. Data description

The dataset used in this study is the "Survey on Remittances and Household Finances in the Philippines,"[13] conducted by the Japan International Cooperation Agency (JICA) in two municipalities in the country: Dingras, Ilocos Norte located in the Northern Luzon Island, and Bansalan, Davao del Sur located in the southern island of Mindanao.[14] The sample size at the first-round was 200 overseas migrant households and 200 non-overseas migrant households in each municipality, which were randomly selected in each area. In the survey, a migrant household is defined as a household that has at least one member who permanently resides at the house but was working or living overseas at the time of data collection. Migrant households were oversampled to make up 50 percent of the total sample, although the stock of overseas Filipino workers was one-tenth of the total population [Commission on Filipinos Overseas 2013]. The barangays served as strata for stratified random sampling in each municipality and the sample households were randomly selected within each barangay.[15] The sample of 200 overseas migrant households was proportionately distributed among the barangays. Once the number of overseas migrant households in a barangay was determined, an equal number of non-overseas migrant households was randomly selected within each barangay. The sample is statistically representative of each municipality.

The questionnaire covered information on household roster, household spending/budgets/assets, remittance-receiving behaviors, and financial inclusion, such as the type of financial accounts that are held by the household members and the methods of financial transactions used, as well as household savings and loans. The eligible respondents were the primary financial decision-makers in each household. The first-round survey was conducted in August and September 2016 in 31 barangays in Dingras and 25 in Bansalan. The sample size for the first round was 834. The second-round survey was implemented in June-August 2017.

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[12] Not using household-data but municipality-level data, Demirgüç-Kunt et al. [2011] showed that remittances are associated with the breadth and depth of the banking sector, i.e., an increase in the number of branches and accounts per capita and the deposits to GDP.

[13] The description of the dataset depends on Murakami et al. [2020]. The field survey was conducted by Orient Integrated Development Consultants Incorporated (OIDCI). Yamada et al. [2019] used the data to analyze the gender gap in financial inclusion in the Philippines and Murakami et al. [2020] used the data to analyze the effects of the Covid-19 pandemic on household welfare.

[14] These municipalities were selected in order to oversample households with overseas migrants. The listing required cooperation from local administrative authorities and public service providers, who keep information on who in the barangay currently resides overseas.

[15] The barangay is an administrative unit and a subdivision of a city or municipality in the Philippines.

The sample size in the second round was 668. The attrition rate was 19.9 percent (16.6 percent in Bansalan and 23.2 percent in Dingras).[16]

Figure 1 illustrates household financial inclusion in the survey. We compare financial inclusion between households receiving remittances and those not receiving remittances. Panel (1) measures financial inclusion in terms of the proportion of households where at least one member holds or uses any or each of the types of financial accounts (bank, cooperative, or microfinance) and has availed themselves of loans (formal, family, or informal). Formal loans include loans from banks, cooperatives, and microfinance loans, as well as state-owned insurance/loan services such as the Government Service Insurance System (GSIS), the Social Security System (SSS), and the Pag-IBIG Fund (Home Development Mutual Fund).[17] Family loans refer to those from family members and relatives, and informal loans include those from local pawnshops, the "5-6" lending scheme,[18] and the Paluwagan (group saving) scheme. We call this measure "household financial inclusion." The proportion of households with any form of financial accounts is 67 percent for households with remittances, which is higher than those without remittances (54 percent). This is also the case for actively using any financial accounts, which sits at 65 percent for households that receive remittances and 53 percent for households that do not receive remittances. Taking a closer look, the proportion of households having/using an account differs between the types of financial institutions. Households with remittances represent a larger proportion of those who have/use a bank account than households that do not receive remittances. The proportion of households that have/use a bank account is 28 percent (27 percent for using it) for remittance-receiving households, which is three times higher than that for non-remittance-receiving households; this is likely because the commission fee that must be paid when receiving remittances is typically lower when the remittance is received through a bank account.[19] In contrast, the proportion of households that hold/use a cooperative account is higher for households without remittances. The proportion of households that hold/use a microfinance account is higher for households with remittances, which is the same situation as with bank accounts, but the gap is smaller. The gap in the proportion of households availing themselves of loans is smaller than that of

[16] In the first-round survey, 32.3 percent of the households in Dingras had at least one migrant and the proportion is much smaller in Bansalan, accounting for only 2.8 percent (10.6 percent of the total samples of two municipalities). According to 2018 National Migration Survey, 8.9 percent of the households in Ilocos Region (where Dingras belongs) had at least one OFW (Overseas Filipino Workers) in the past 12 months. It was 5.7 percent for the Davao where Bansalan is located (6.4 percent nationwide). The average proportion of income from remittance for households with migrants was 43.2 percent in Dingras and 50.2 percent in Bansalan at the first-round survey. Therefore, our data covers the regions both more and less heavily depending on migration and remittances.

[17] The beneficiaries of GSIS are the government employees. SSS is the state-owned insurance system for general citizens. The Pag-IBIG Fund provides short-term loans and housing programs run by the government.

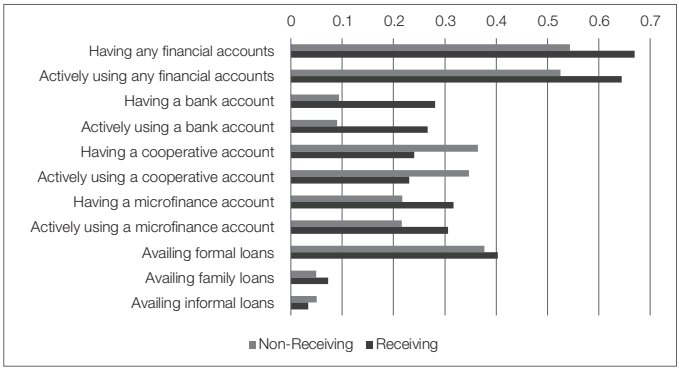
[18] The "5-6" lending scheme is a popular informal finance scheme typically exercised by Indian lenders in the Philippines. It is called 5-6 because they are said to charge 20 percent interest per month.

[19] World Bank [2020d].

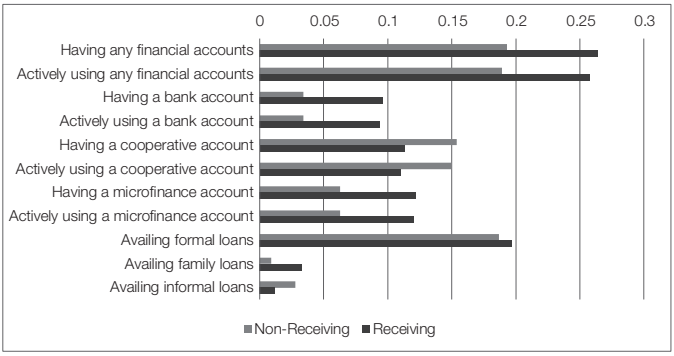
financial accounts. The proportion of households using formal or family loans is slightly higher for households with remittances but the proportion of households availing themselves of informal loans is slightly higher for households without remittances.

FIGURE 1. Financial inclusion in households with and without remittances

1. Household financial inclusion



2. Women's financial inclusion



Note: Authors' calculation. Panel (1) shows proportions of households where at least one member holds or uses any or each of financial account types (bank, cooperative, or microfinance) and which avails itself of loans (formal, family, and informal). Panel (2) shows the same proportions of households whose at least one female member holds or uses any or each financial account and which avails loans.

Panel (2) illustrates the same proportion of households where at least one of the women holds or uses a financial account and/or has taken out a loan. This definition is called "women's financial inclusion." Here we see the same pattern as observed in Panel (1). The proportion of having/using any financial accounts is higher for households with remittances, which is also the case for bank or microfinance accounts; however, the proportion is lower for cooperative accounts. The gap in the proportion of households availing themselves of loans is small. This gap is slightly higher in relation to formal and family loans and is slightly lower in relation to informal loans for households with remittances.

In sum, a simple comparison of averages shows that (with the exception of cooperative accounts) remittance-receiving households are more financially included than households that do not receive remittances. When looking at having/using a bank account where the commission fee for receiving remittances is low, the difference is pronounced. However, we cannot immediately conclude that remittances promote financial inclusion as we must first address any endogeneity issues, such as reverse causality and any third factor affecting both remittances and financial inclusion. Therefore, we must first perform estimation correcting endogeneity to explore whether remittances indeed promote financial inclusion or not.

Table 1 shows the summary statistics of the variables used in the estimation.[20] Here we use the data from the households that were surveyed during both the first and second rounds. In the case of household financial inclusion, the average number of households having or actively using any financial accounts is more than 50 percent. By type of financial institution, the average proportion is higher for a microfinance account at close to 30 percent, followed by a cooperative account, and having or using a bank account is smaller at close to 20 percent. With regard to women's financial inclusion, the average number of women who hold or use any financial accounts is close to 20 percent. By type of financial institutions, we note that the highest proportion is found in a cooperative account and the proportion is on par with that of bank accounts and microfinance accounts. The proportion of households using loans is the highest in formal loans and that to use family loans or informal loans is small. This pattern is also observed in relation to women's financial inclusion. As will be explained in the next section, "Destination per capita GDP (*ECON*)" refers to the weighted average of per capita Gross Domestic Product (GDP) for all destination countries and the Philippines. The remaining variables are related to remittances and household characteristics. Half of all households receive remittances, which stems from our sampling design, and the average monthly remittances per capita is 30.1 pesos.[21] Turning to household characteristics, the average age of the head of households is 52 years old and the household size including overseas members is close to five people. More than half of all heads of households had attained secondary education or higher. The share of non-agricultural occupation is less than 20 percent.[22] The remaining variables capture any adverse shocks to households.[23] Approximately, 18 percent of all households experienced unemployment or business failure, and 16 percent of households suffered as a result of illness, accidents, or disasters. More than 20 percent of all households suffered from crop failure and 10 percent experienced family separation.

[20] At the first around survey, we see that per capita expenditure is systematically larger and the ages of the heads of household are higher for the attrition households. Thus, households in the sample cover the lower side of income distribution in the two village economies.

[21] The mean covers all sample households including non-receiving ones.

[22] Seamen occupy a large part of the migrant job market in the Philippines but our sample contains very few of those migrants.

[23] These reported shocks happened in the year prior to the 1st round survey and after the 1st round survey for the 2nd round.

TABLE 1. Summary statistics

Variables	(1) N	(2) Mean	(3) S.d	(4) Min	(5) Max
Household financial inclusion					
Having any financial accounts	1,296	0.566	0.496	0	1
Actively using financial accounts	1,296	0.544	0.498	0	1
Having a bank account	1,296	0.193	0.395	0	1
Actively using a bank account	1,296	0.181	0.385	0	1
Having a cooperative account	1,296	0.251	0.434	0	1
Actively using a cooperative account	1,296	0.230	0.421	0	1
Having a microfinance account	1,296	0.292	0.455	0	1
Actively using a microfinance account	1,296	0.288	0.453	0	1
Financial inclusion of Women					
Having any financial accounts	1,265	0.196	0.397	0	1
Actively using any financial account	1,265	0.191	0.393	0	1
Having a bank account	1,265	0.081	0.272	0	1
Actively using a bank account	1,265	0.078	0.269	0	1
Having a cooperative account	1,265	0.101	0.302	0	1
Actively using a cooperative account	1,265	0.094	0.292	0	1
Having a microfinance account	1,265	0.084	0.277	0	1
Actively using a microfinance account	1,265	0.084	0.277	0	1
Household loans					
Formal loans	1,296	0.343	0.475	0	1
Family loans	1,296	0.070	0.256	0	1
Informal loans	1,296	0.034	0.181	0	1
Loans to women					
Formal loans	1,265	0.146	0.353	0	1
Family loans	1,265	0.022	0.147	0	1
Informal loans	1,265	0.009	0.0970	0	1
Destination per capita GDP*	1,296	8.571	0.792	7.917	10.61
Receive Remittances (dummy)	1,296	0.519	0.500	0	1
Remittance Income (log)	1,296	3.558	3.563	0	10.82
Head's age	1,296	51.73	13.85	20	95
Square of head's age	1,296	2,867	1,474	400	9,025
HH size including overseas members	1,296	4.945	2.143	1	15
Secondary or above education	1,296	0.584	0.493	0	1
Non-agricultural Occupation	1,296	0.184	0.387	0	1
Unemployment and business failure	1,296	0.184	0.388	0	1
Illness, accident, and disasters	1,296	0.168	0.374	0	1
Crop failure	1,296	0.215	0.411	0	1
Family Separation	1,296	0.125	0.331	0	1

Note: Authors' calculation.
* refers to a weighted average of all destinations including the Philippines in logarithm.

4. Empirical analysis

Using the data explained in the previous section, we empirically examine the impact of overseas remittances on household financial inclusion. We are interested in estimating:

$$FL_{it} = \beta_0 + \beta(REMITTANCE_{it}) + \gamma \mathbf{x}_{it} + barangay_i + \lambda_t + \varepsilon_{it} \qquad (1)$$

where i indexes households and t refers to the survey round with 0 indicating 2016 and 1 indicating 2017. The dependent variables FL_{it} consist of three groups. The first group considers household financial inclusion and consists of the binary variables of having or using any financial accounts and having or using each type of financial account (bank, cooperative, or microfinance). FL_{it} takes one if any household members have or use financial accounts and 0 for if no household members have or use financial accounts. The second group contains the same indicators for women's financial inclusion. FL_{it} takes one if any female household members have or use financial accounts and 0 for if no female household members have or use financial accounts. The third group has binary variables to indicate households with at least one member who uses loans according to type (formal, family or informal) and those variables for households with at least one female member who avails herself of loans.

The main explanatory variable $REMITTANCE_{it}$ takes two forms: an indicator for households who receive remittances, or do not, and the log of average monthly income from overseas remittance per capita. Both variables are computed using the information on the average monthly income either over the past 12 months for the first round or the period since the first-round visit in the case of the second round.[24] $\mathbf{x}$ is a vector of household characteristics that includes the age of the household head, household size, the educational attainment level of the household head, their occupation and a variety of adverse shocks to the household; these figures are shown in Table 1. We also include barangay fixed effect ($barangay_i$) and survey round fixed effect (λ_t). Lastly, ε_{it} is an i.i.d. error term.

There is a concern about the endogeneity issue since financial inclusion is likely to be affected by remittances and vice versa. It is well known that addressing endogeneity is one of the most crucial elements of estimation relating to remittances and the effects [McKenzie et al. 2010]. In the context of the Philippines, individuals with high endowments hold a higher ability to earn and they are more likely to migrate abroad and, at the same time, to have bank accounts for their financial transactions. If this is the case, an OLS estimate will produce biased coefficients.

[24] Since the interval between the two round surveys is less than one year, we use the value of the monthly average since the first-round visit. The qualitative results are not changed if we use the average over the past 12 months for the second round.

In order to correct the endogeneity of remittances in relation to financial inclusion, we employ a two-stage least squares (2SLS) estimation using an index of the macroeconomic performance of the destination countries and the Philippines as an instrumental variable (IV) for remittances.[25] We assume that the macroeconomic conditions affect remittances but do not directly affect the financial inclusion of households in the Philippines. We assume that GDP per capita is exogenous to the number of remittances in each household, meaning that the variable picks up supply-side shocks on migrants' remittances, which reflects labor market conditions that they are exposed to in the destination countries.

We construct the economic performance (*ECON*) variable, the index of the macroeconomic performance in the destination and home countries, by taking the weighted average per capita GDP of the country of residence of each household member including overseas migrants. More specifically, the *ECON* variable is defined as:

$$ECON_{it} = \mathrm{In}\frac{\Sigma_{k\in\kappa(i)} g_{kt} \times n_{kit}}{\Sigma_{k\in\kappa(i)} n_{kit}}$$

Here, $k(i)$ refers to the set of countries where the adult members of a household i live, g_{kt} is the log GDP per capita in country k in t (2016 or 2017), and n_{kit} is the number of household i's adult members who live in the country k. Thus, by construction, we use per capita GDP in the Philippines for households without migrants. We acknowledge that there are threats to exclusion restrictions for this instrument. For example, it is possible that high-endowment migrants are also likely to choose a high-income destination country. It is also possible that changes in economic performance outside the Philippines will have a direct effect on the financial transactions in the Philippines not through remittances but trade and financial channels affecting wage and employment prospects. We note these threats can cause estimation bias for the impact of remittances on financial inclusion. However, given the diversity of destination countries by Filipino migrants, we use this instrumental variable because per capita GDPs are widely available statistics across countries and years.[26, 27]

[25] Ratha and Shaw [2007] used weighted value of destination GDP in cross-country estimating remittances inflow. Yang [2008] instead used the appreciation of the Philippine peso during the 1997 Asian financial crisis as an exogenous shock to international remittances.

[26] Overestimation bias is likely if households with unobserved high endowment are more likely to be financially included. Underestimation bias is likely if the change in destination's GDP tends to be positively correlated with the change in the Philippines GDP. In this case, the Philippines GDP will affect more profoundly the economic situation of non-remittance receiving households whose breadwinner works in domestic labor market.

[27] In our sample, the destination of migrants is diversified across 33 countries and seaman. The top 10 destinations are; Saudi Arabia (18.5 percent), Kuwait (11.2 percent), UAE (9.7 percent), Hawaii (8.5 percent), Hong Kong (6.4 percent), Canada (5.8 percent), Singapore (5.2 percent), Japan (5.2 percent), Qatar (3.6 percent), and the USA (3.6 percent).

In the estimation, we pool the observations for all households (two observations for each household). While the dataset is longitudinal, the interval is short (less than one year) and we see little change in the remittances during the survey period. Thus, we use a level specification by pooling the observations at the first and second rounds, rather than a difference specification where it is difficult to obtain stable estimation results.

We estimate specification (1) using 2SLS with instrumenting $REMITTANCE_{ii}$ by $ECON_{it}$. The first stage equation is explicitly given as:

$$REMITTANCE_{it} = \eta_0 + \eta\left(ECON_{it}\right) + \delta \mathbf{x}_{it} + barangay_i + \mu_t + v_{it} \qquad (2)$$

where the notations are the same as in equation (1) except for the main explanatory variable *ECON* explained above. We apply a linear specification both for the first stage and the second stage equations to estimate the coefficients at the first and second stages in a single estimation procedure.

Column (1) of Table 2 shows that the coefficient on *ECON* is positive and significant at the first stage regression when the dependent variable is a dummy for households to receive any remittances indicating that the variable serves as a valid instrument. We performed a weak IV test and confirmed that *F*-test statistic for weak IV is 732.1 with p value of 0.00. The remaining columns of Table 2 (1) report the coefficients at the second stage regression for household financial inclusion. The coefficients on remittances are positive but not statistically significant in Column (1) and (2) but they are positive and significant for having/using a bank account, showing that households receiving remittances are 20 percent more likely to have or use a bank account than households that do not receive remittances. Those coefficients are not significant for having/using a cooperative account (Columns (5) and (6)) nor for having/using a microfinance account (Columns (7) and (8)). Table 2 (2) shows the results for women's financial inclusion. The positive and significant coefficients on remittance in Column (1) and (2) implies that households with remittances are more likely to have or use any financial accounts than households without remittances. The coefficients on remittances are positive and significant for having/using a bank account (Columns (3) and (4)) or a microfinance account (Columns (7) and (8)). Table 2 (3) reports that the coefficients in the case of loans are not significant in all columns except informal loans to women's financial inclusion; remittance is negatively associated with informal loans in the case.

TABLE 2. Estimation results (2SLS; Dummy for remittances)

1. Household financial inclusion

	First Stage	Second Stage							
VARIABLES	**Receive remittances (dummy)**	**(1) Having any financial accounts**	**(2) Using any financial accounts**	**(3) Having a bank account**	**(4) Using a bank account**	**(5) Having a cooperative account**	**(6) Using a cooperative account**	**(7) Having a microfinance account**	**(8) Using a microfinance account**
Destination per capita GDP	0.431***								
	(0.0169)								
Receive remittances (dummy)		0.0896	0.0569	0.224***	0.213***	0.0323	0.00413	-0.0317	-0.0326
		(0.0644)	(0.0624)	(0.0533)	(0.0519)	(0.0450)	(0.0415)	(0.0595)	(0.0592)
Head's age	-0.0177***	0.0347*	0.0342*	0.00362	0.00447	0.0348*	0.0318*	0.0168	0.0181
	(0.00664)	(0.0185)	(0.0177)	(0.00915)	(0.00890)	(0.0187)	(0.0184)	(0.0114)	(0.0111)
Square of head's age	0.000194***	-0.000388**	-0.000364**	-3.16e-05	-3.82e-05	-0.000370**	-0.000323*	-0.000173*	-0.000184*
	(6.28e-05)	(0.000174)	(0.000165)	(8.46e-05)	(8.17e-05)	(0.000174)	(0.000169)	(0.000105)	(0.000103)
HH size including overseas members	0.00718	-0.00461	0.00563	-0.0134	-0.0133	-0.00654	0.00392	0.0156	0.0150
	(0.00635)	(0.0166)	(0.0162)	(0.0101)	(0.00976)	(0.0148)	(0.0142)	(0.0132)	(0.0131)
Secondary or above education	0.0632**	0.0841	0.107*	0.113***	0.116***	-0.0178	-0.00511	-0.0545	-0.0496
	(0.0320)	(0.0585)	(0.0572)	(0.0372)	(0.0369)	(0.0515)	(0.0490)	(0.0737)	(0.0734)
Non-agricultural Occupation	0.0311	0.100	0.117*	0.0884**	0.0867**	0.00363	0.0108	0.0965	0.0999
	(0.0446)	(0.0619)	(0.0625)	(0.0393)	(0.0379)	(0.0638)	(0.0636)	(0.0957)	(0.0954)
Unemployment and business failure	-0.0238	-0.184**	-0.198***	-0.0813	-0.0721	-0.130*	-0.151*	0.00288	0.00958
	(0.0321)	(0.0716)	(0.0725)	(0.0507)	(0.0499)	(0.0789)	(0.0806)	(0.0531)	(0.0522)
Illness, accidents, and disasters	0.0692	0.00276	0.0163	-0.0832*	-0.0822*	-0.0457	-0.0349	0.0897	0.0933
	(0.0567)	(0.0676)	(0.0712)	(0.0427)	(0.0424)	(0.0758)	(0.0787)	(0.0720)	(0.0713)
Crop failure	-0.00419	0.137**	0.131**	-0.0784*	-0.0765*	0.0871	0.0834	0.0390	0.0402
	(0.0217)	(0.0561)	(0.0583)	(0.0447)	(0.0448)	(0.0607)	(0.0628)	(0.0796)	(0.0790)
Family separation	-0.0267	0.158**	0.108	0.00423	0.00211	0.157*	0.106	-0.0205	-0.0195
	(0.0354)	(0.0772)	(0.0840)	(0.0339)	(0.0334)	(0.0809)	(0.0895)	(0.0544)	(0.0541)
Constant	-2.913***	-0.478	-0.568	0.0666	0.0394	-0.720	-0.733	-0.134	-0.176
	(0.269)	(0.465)	(0.450)	(0.263)	(0.259)	(0.460)	(0.458)	(0.300)	(0.293)
Observations	1,296	1,296	1,296	1,296	1,296	1,296	1,296	1,296	1,296
R-squared	0.503	0.328	0.320	0.196	0.190	0.409	0.394	0.248	0.251

Note: Cluster-robust standard errors at the household level in parentheses.*** $p<0.01$, ** $p<0.05$, * $p<0.1$. *F*-test statistic for weak IV is 732.11 with p-value of 0.00.

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TABLE 2. Estimation results (2SLS; Dummy for remittances) continued
2. Women's financial inclusion

	First Stage	Second Stage							
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	**Receive remittances (dummy)**	**Having any financial accounts**	**Using any financial accounts**	**Having a bank account**	**Using a bank account**	**Having a cooperative account**	**Using a cooperative account**	**Having a microfinance account**	**Using a microfinance account**
Destination per capita GDP	0.435***								
	(0.0172)								
Receive remittances (dummy)		0.106**	0.104**	0.0847**	0.0814**	-0.00507	-0.00911	0.0923**	0.0923**
		(0.0489)	(0.0488)	(0.0332)	(0.0330)	(0.0245)	(0.0240)	(0.0402)	(0.0402)
Head's age	-0.0172**	0.00110	0.000506	-0.00133	-0.000525	0.00348	0.00165	0.00764	0.00764
	(0.00683)	(0.0153)	(0.0151)	(0.00347)	(0.00318)	(0.0144)	(0.0143)	(0.00738)	(0.00738)
Square of head's age	0.000191***	8.69e-06	1.46e-05	1.98e-05	1.12e-05	-2.36e-05	-4.67e-06	-6.83e-05	-6.83e-05
	(6.42e-05)	(0.000140)	(0.000139)	(3.46e-05)	(3.13e-05)	(0.000132)	(0.000131)	(7.00e-05)	(7.00e-05)
HH size including overseas members	0.00641	0.00943	0.0101	0.00349	0.00270	0.00914	0.0107	0.000635	0.000635
	(0.00677)	(0.0123)	(0.0122)	(0.00538)	(0.00531)	(0.00916)	(0.00908)	(0.00850)	(0.00850)
Secondary or above education	0.0662*	0.0130	0.00962	0.0269*	0.0286*	-0.00652	-0.0101	-0.0662	-0.0662
	(0.0347)	(0.0573)	(0.0569)	(0.0154)	(0.0154)	(0.0552)	(0.0547)	(0.0496)	(0.0496)
Non-agricultural Occupation	0.0291	0.217**	0.221**	0.00934	0.00930	0.179**	0.184**	0.116	0.116
	(0.0464)	(0.0979)	(0.0975)	(0.0151)	(0.0149)	(0.0839)	(0.0837)	(0.0900)	(0.0900)
Unemployment and business failure	-0.0203	-0.0771	-0.0742	0.0316	0.0326	-0.155**	-0.153**	0.0151	0.0151
	(0.0345)	(0.0683)	(0.0683)	(0.0214)	(0.0214)	(0.0626)	(0.0629)	(0.0466)	(0.0466)
Illness, accidents, and disasters	0.0690	-0.0661	-0.0575	-0.00432	-0.00302	-0.130**	-0.119*	0.0445	0.0445
	(0.0595)	(0.0627)	(0.0620)	(0.0133)	(0.0131)	(0.0613)	(0.0616)	(0.0429)	(0.0429)
Crop failure	-0.00366	0.0792	0.0833	0.000550	0.00161	0.00877	0.0129	0.0110	0.0110
	(0.0231)	(0.0787)	(0.0779)	(0.0158)	(0.0160)	(0.0706)	(0.0701)	(0.0662)	(0.0662)
Family separation	-0.0256	0.130	0.135	-0.00359	-0.00426	0.155**	0.163**	-0.0687*	-0.0687*
	(0.0357)	(0.0847)	(0.0836)	(0.0111)	(0.0111)	(0.0788)	(0.0776)	(0.0416)	(0.0416)
Constant	-2.955***	-0.0644	-0.0536	0.0800	0.0672	-0.197	-0.163	-0.0480	-0.0480
	(0.274)	(0.407)	(0.405)	(0.152)	(0.149)	(0.377)	(0.375)	(0.216)	(0.216)
Observations	1,265	1,265	1,265	1,265	1,265	1,265	1,265	1,265	1,265
R-squared	0.502	0.256	0.264	0.120	0.117	0.321	0.332	0.149	0.149

Note: Cluster-robust standard errors at the household level in parentheses.*** $p<0.01$, ** $p<0.05$, * $p<0.1$. *F*-test statistic for weak IV is 732.11 with p-value of 0.00.

TABLE 2. Estimation results (2SLS; Dummy for remittances) continued

3. Loans

	Second Stage					
Variables	**(1) Availing family loans**	**(2 Availing formal loans**	**(3) Availing informal loans**	**(4) Availing family loans (female)**	**(5) Availing formal loans (female)**	**(6) Availing informal loans (female)**
Receive remittances (dummy)	-0.0248	-0.00593	-0.0133	-0.00542	-0.00125	-0.0177*
	(0.0575)	(0.0291)	(0.0192)	(0.0420)	(0.0174)	(0.0103)
Head's age	0.0328**	0.000520	0.000425	0.0139	-0.00224	-0.00172*
	(0.0154)	(0.00265)	(0.00282)	(0.0145)	(0.00203)	(0.000998)
Square of head's age	-0.000373**	-5.53e-06	1.99e-06	-0.000120	2.62e-05	2.08e-05*
	(0.000145)	(2.75e-05)	(3.14e-05)	(0.000135)	(2.14e-05)	(1.23e-05)
HH size including overseas members	0.0152	-0.00387	0.00170	0.0242*	-0.00110	0.00167
	(0.0154)	(0.00306)	(0.00345)	(0.0146)	(0.00189)	(0.00102)
Secondary or above education	0.00474	-0.0104	-0.00676	0.0221	-0.00464	0.00103
	(0.0532)	(0.0144)	(0.0208)	(0.0527)	(0.00814)	(0.00534)
Non-agricultural Occupation	0.0772	-0.00453	-0.0142	0.158	-0.000136	0.0120
	(0.0906)	(0.0117)	(0.0121)	(0.102)	(0.00630)	(0.00801)
Unemployment and business failure	-0.0364	0.0171	0.00618	-0.0626	0.00966	-0.000987
	(0.0727)	(0.0182)	(0.0172)	(0.0670)	(0.0158)	(0.00790)
Illness, accidents, and disasters	-0.0440	0.0245	0.0119	-0.0788	0.00695	-0.00293
	(0.0886)	(0.0181)	(0.0185)	(0.0651)	(0.0107)	(0.00334)
Crop failure	0.235***	0.0207	0.00808	0.0877	0.0171	3.65e-05
	(0.0762)	(0.0201)	(0.0149)	(0.0700)	(0.0179)	(0.00632)
Family separation	-0.0228	0.0279	0.00409	0.115	0.0306*	0.00755*
	(0.123)	(0.0204)	(0.0213)	(0.0920)	(0.0180)	(0.00433)
Constant	-0.565	0.223*	-0.0112	-0.437	0.166	0.0250
	(0.419)	(0.131)	(0.0586)	(0.395)	(0.111)	(0.0182)
Observations	1,296	1,296	1,296	1,265	1,265	1,265
R-squared	0.242	0.181	0.484	0.273	0.121	0.826

Note: Cluster-robust standard errors at the household level in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 3 illustrates the results when the dependent variable is a logarithm of the number of remittances. The coefficient on *ECON* is positive and significant and indicates that the instrumental variable is valid. We performed a weak IV test and confirmed that F-test statistic for weak IV is 898.6 with p value of 0.00. The remaining columns show the coefficients at the second stage for household financial inclusion. The pattern of the coefficients is similar to those in Table 2. The coefficients are not significant in relation to having/using any financial accounts, a cooperative account, or a microfinance account; however, they are positive and significant for having/using a bank account. The coefficients imply that a one percent increase in the amount of remittance enhances the propensity of a household to have or use a bank account by 0.03 percent. Table 3 (2) shows the results for women's financial inclusion. The coefficient of remittance is 0.014 in Columns (1) and (2) implying that a one percent increase in the amount of remittances raises the probability of having or using a financial account by 0.01 percent. The coefficients pertaining to remittances are positive and significant for having/using a bank account or a microfinance account, and the size of the coefficients are comparable with those in Columns (1) and (2). Table 3 (3) shows that in the case of loans and remittances, the coefficients are not significant in all columns except informal loans to women's financial inclusion.

TABLE 3. Estimation results (2SLS; Amounts for remittances)
1. Household financial inclusion

	First Stage	Second Stage							
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	**Remittance income (log)**	**Having any financial accounts**	**Using any financial accounts**	**Having a bank account**	**Using a bank account**	**Having a cooperative account**	**Using a cooperative account**	**Having a microfinance account**	**Using a microfinance account**
Destination per capita GDP	3.301***								
	(0.117)								
Receive remittances (log)		0.0117	0.00743	0.0293***	0.0279***	0.00422	0.000540	-0.00414	-0.00425
		(0.00842)	(0.00815)	(0.00694)	(0.00675)	(0.00588)	(0.00542)	(0.00777)	(0.00772)
Head's age	-0.0658**	0.0339*	0.0337*	0.00158	0.00252	0.0345*	0.0318*	0.0171	0.0184*
	(0.0321)	(0.0185)	(0.0177)	(0.00937)	(0.00912)	(0.0187)	(0.0183)	(0.0113)	(0.0110)
Square of head's age	0.000813**	-0.000380**	-0.000359**	-1.18e-05	-1.94e-05	-0.000367**	-0.000323*	-0.000176*	-0.000187*
	(0.000318)	(0.000174)	(0.000164)	(8.62e-05)	(8.34e-05)	(0.000173)	(0.000168)	(0.000104)	(0.000102)
HH size including overseas members	0.0524	-0.00458	0.00565	-0.0133	-0.0132	-0.00653	0.00392	0.0156	0.0149
	(0.0347)	(0.0167)	(0.0163)	(0.0104)	(0.0101)	(0.0148)	(0.0142)	(0.0132)	(0.0131)
Secondary or above education	0.309	0.0861	0.108*	0.118***	0.120***	-0.0171	-0.00501	-0.0552	-0.0503
	(0.191)	(0.0586)	(0.0572)	(0.0380)	(0.0377)	(0.0514)	(0.0488)	(0.0734)	(0.0731)
Non-agricultural Occupation	-0.0170	0.103*	0.119*	0.0959**	0.0938**	0.00471	0.0110	0.0954	0.0988
	(0.170)	(0.0627)	(0.0630)	(0.0429)	(0.0415)	(0.0638)	(0.0637)	(0.0960)	(0.0957)
Unemployment and business failure	-0.0937	-0.185***	-0.199***	-0.0839*	-0.0745	-0.131*	-0.151*	0.00325	0.00996
	(0.190)	(0.0717)	(0.0725)	(0.0505)	(0.0496)	(0.0789)	(0.0805)	(0.0531)	(0.0521)
Illness, accidents, and disasters	0.349	0.00488	0.0177	-0.0779*	-0.0771*	-0.0449	-0.0348	0.0889	0.0925
	(0.252)	(0.0680)	(0.0714)	(0.0409)	(0.0407)	(0.0762)	(0.0788)	(0.0722)	(0.0715)
Crop failure	-0.0797	0.137**	0.132**	-0.0770*	-0.0752*	0.0873	0.0834	0.0388	0.0400
	(0.121)	(0.0561)	(0.0583)	(0.0443)	(0.0445)	(0.0608)	(0.0629)	(0.0796)	(0.0791)
Family separation	-0.0350	0.156**	0.107	-0.000734	-0.00263	0.156*	0.106	-0.0198	-0.0188
	(0.171)	(0.0774)	(0.0841)	(0.0343)	(0.0338)	(0.0808)	(0.0894)	(0.0544)	(0.0541)
Constant	-23.18***	-0.468	-0.561	0.0922	0.0638	-0.717	-0.732	-0.137	-0.179
	(1.773)	(0.468)	(0.451)	(0.267)	(0.263)	(0.460)	(0.457)	(0.298)	(0.291)
Observations	1,296	1,296	1,296	1,296	1,296	1,296	1,296	1,296	1,296
R-squared	0.584	0.325	0.319	0.198	0.191	0.409	0.394	0.248	0.252

Note: Cluster-robust standard errors at the household level in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. *F*-test statistic for weak IV is 898.607 with p-value of 0.00.

TABLE 3. Estimation results (2SLS; Amounts for remittances) continued

2. Women's Financial Inclusion

	First Stage	Second Stage							
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	**Remittance income (log)**	**Having any financial accounts**	**Using any financial accounts**	**Having a bank account**	**Using a bank account**	**Having a cooperative account**	**Using a cooperative account**	**Having a microfinance account**	**Using a microfinance account**
Destination per capita GDP	3.322***								
	(0.119)								
Receive remittances (log)		0.0138**	0.0136**	0.0111**	0.0106**	-0.000663	-0.00119	0.0121**	0.0121**
		(0.00641)	(0.00640)	(0.00435)	(0.00432)	(0.00321)	(0.00314)	(0.00528)	(0.00528)
Head's age	-0.0610*	0.000123	-0.000455	-0.00212	-0.00128	0.00353	0.00173	0.00678	0.00678
	(0.0332)	(0.0152)	(0.0150)	(0.00337)	(0.00307)	(0.0144)	(0.0143)	(0.00734)	(0.00734)
Square of head's age	0.000772**	1.81e-05	2.39e-05	2.74e-05	1.85e-05	-2.41e-05	-5.49e-06	-6.01e-05	-6.01e-05
	(0.000326)	(0.000140)	(0.000138)	(3.36e-05)	(3.01e-05)	(0.000131)	(0.000130)	(6.95e-05)	(6.95e-05)
HH size including overseas members	0.0441	0.00950	0.0101	0.00355	0.00275	0.00913	0.0107	0.000694	0.000694
	(0.0374)	(0.0123)	(0.0123)	(0.00547)	(0.00539)	(0.00916)	(0.00907)	(0.00859)	(0.00859)
Secondary or above education	0.313	0.0156	0.0122	0.0291*	0.0306**	-0.00665	-0.0103	-0.0639	-0.0639
	(0.206)	(0.0574)	(0.0570)	(0.0152)	(0.0152)	(0.0550)	(0.0546)	(0.0498)	(0.0498)
Non-agricultural Occupation	-0.0370	0.221**	0.225**	0.0122	0.0121	0.178**	0.184**	0.119	0.119
	(0.177)	(0.0973)	(0.0970)	(0.0146)	(0.0145)	(0.0839)	(0.0836)	(0.0897)	(0.0897)
Unemployment and business failure	-0.0746	-0.0782	-0.0753	0.0307	0.0318	-0.155**	-0.153**	0.0141	0.0141
	(0.205)	(0.0683)	(0.0684)	(0.0214)	(0.0214)	(0.0626)	(0.0628)	(0.0466)	(0.0466)
Illness, accidents, and disasters	0.355	-0.0637	-0.0551	-0.00240	-0.00118	-0.130**	-0.120*	0.0466	0.0466
	(0.265)	(0.0618)	(0.0611)	(0.0126)	(0.0125)	(0.0615)	(0.0618)	(0.0425)	(0.0425)
Crop failure	-0.0838	0.0800	0.0841	0.00117	0.00221	0.00873	0.0128	0.0117	0.0117
	(0.127)	(0.0788)	(0.0780)	(0.0158)	(0.0159)	(0.0706)	(0.0701)	(0.0662)	(0.0662)
Family separation	-0.0201	0.127	0.133	-0.00554	-0.00613	0.155**	0.163**	-0.0708*	-0.0708*
	(0.174)	(0.0845)	(0.0834)	(0.0108)	(0.0108)	(0.0789)	(0.0777)	(0.0416)	(0.0416)
Constant	-23.44***	-0.0527	-0.0420	0.0894	0.0763	-0.197	-0.164	-0.0377	-0.0377
	(1.800)	(0.406)	(0.404)	(0.150)	(0.148)	(0.377)	(0.375)	(0.214)	(0.214)
Observations	1,265	1,265	1,265	1,265	1,265	1,265	1,265	1,265	1,265
R-squared	0.583	0.257	0.266	0.125	0.122	0.320	0.332	0.150	0.150

Note: Cluster-robust standard errors at the household level in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. *F*-test statistic for weak IV is 898.607 with p-value of 0.00.

TABLE 3. Estimation results (2SLS; Amounts for remittances) continued

3. Loans

	Second Stage					
Variables	**(1) Availing family loans**	**(2 Availing formal loans**	**(3) Availing informal loans**	**(4) Availing family loans (female)**	**(5) Availing formal loans (female)**	**(6) Availing informal loans (female)**
Receive remittances (dummy)	-0.00324	-0.000774	-0.00174	-0.000709	-0.000164	-0.00232*
	(0.00749)	(0.00380)	(0.00251)	(0.00550)	(0.00228)	(0.00135)
Head's age	0.0330**	0.000574	0.000547	0.0140	-0.00223	-0.00155
	(0.0153)	(0.00261)	(0.00276)	(0.0144)	(0.00198)	(0.000957)
Square of head's age	-0.000375***	-6.05e-06	8.16e-07	-0.000121	2.61e-05	1.92e-05
	(0.000144)	(2.69e-05)	(3.07e-05)	(0.000134)	(2.09e-05)	(1.18e-05)
HH size including overseas members	0.0152	-0.00387	0.00169	0.0242*	-0.00110	0.00166
	(0.0154)	(0.00306)	(0.00344)	(0.0146)	(0.00189)	(0.00101)
Secondary or above education	0.00417	-0.0106	-0.00706	0.0220	-0.00468	0.000579
	(0.0529)	(0.0143)	(0.0206)	(0.0525)	(0.00809)	(0.00521)
Non-agricultural Occupation	0.0763	-0.00472	-0.0146	0.158	-0.000179	0.0114
	(0.0906)	(0.0117)	(0.0119)	(0.102)	(0.00627)	(0.00776)
Unemployment and business failure	-0.0361	0.0171	0.00634	-0.0626	0.00967	-0.000801
	(0.0725)	(0.0182)	(0.0171)	(0.0669)	(0.0158)	(0.00789)
Illness, accidents, and disasters	-0.0445	0.0243	0.0115	-0.0789	0.00692	-0.00333
	(0.0883)	(0.0180)	(0.0184)	(0.0652)	(0.0106)	(0.00324)
Crop failure	0.235***	0.0206	0.00800	0.0877	0.0171	-9.27e-05
	(0.0763)	(0.0201)	(0.0149)	(0.0700)	(0.0179)	(0.00633)
Family separation	-0.0222	0.0280	0.00438	0.116	0.0306*	0.00796*
	(0.123)	(0.0204)	(0.0215)	(0.0920)	(0.0181)	(0.00445)
Constant	-0.568	0.223*	-0.0127	-0.438	0.166	0.0231
	(0.417)	(0.131)	(0.0579)	(0.394)	(0.111)	(0.0177)
Observations	1,296	1,296	1,296	1,265	1,265	1,265
R-squared	0.243	0.181	0.484	0.273	0.121	0.827

Note: Cluster-robust standard errors at the household level in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

In summary, remittances are positively associated with the promotion of financial inclusion controlling after endogeneity using 2SLS with an instrumental variable and this is especially the case for women. The variables related to remittances are positive and significant in respect of having/using a bank account for household financial inclusion, whereas they are positive and significant for any financial accounts, a bank account, or a microfinance account concerning women's financial inclusion. Loans are not significantly related to remittances except that remittances make informal loans less dependent on women's financial inclusion. Thus, a substantial decline in remittances caused by the COVID-19 pandemic may discourage financial inclusion, in particular obtaining and using a bank account, for both men and women, and may discourage women from obtaining a microfinance account.[28]

[28] As a robustness check, we ran the regression separately for each round observations and obtained qualitatively the same results.

5. Discussion

We use the coefficients obtained in the 2SLS estimation in Table 3 to gauge the potential impact of the COVID-19 pandemic on financial inclusion in the Philippines. To do so, we use the per capita GDP predictions available for each country in 2020 from two economic outlooks—the International Monetary Fund (IMF)'s "World Economic Outlook" published in October 2019 and June 2020 and the World Bank (WB)'s "Global Economic Prospects" published in January and June 2020.[29] The outlooks published prior to the outbreak in October 2019 and in January 2020 serve as a "no-COVID" forecast. These forecasts helped us to construct the hypothetical *ECON* variable in the case where a global COVID-19 pandemic had not taken place. Conversely, the revised outlooks that were published in June 2020 after the outbreak of COVID-19, are used to construct the "with-COVID" economic scenarios. The "with-COVID" scenarios contain two cases in the "World Economic Outlook" and three cases in the "Global Economic Prospects". Details of the scenarios are given in Table 4.

We compute the predicted values by plugging the hypothetical *ECON* variables constructed using each of the different GDP per capita forecasts (three cases in the "World Economic Outlook" and four cases in the "Global Economic Prospects" both of which include the "no-COVID" case) for remittance-receiving households into our 2SLS estimates. We then compare the mean predicted values for the various outcome variables in each scenario. The difference between the "with-COVID" and the "no-COVID" scenario captures the potential impact of the COVID economic shock on financial inclusion. We acknowledge that this exercise depends on several assumptions. First, we assume that the change in the prediction of GDP in 2020 at the two different dates is entirely attributed to the pandemic, though some countries might have had a downward revision of the GDP prediction for 2020 without the COVID-19 outbreak. Second, we assume that the adverse effects caused by the COVID-19 pandemic including restricting migration through bans on international movement, limiting remittance transactions, and a stagnant economy in the host countries, is summarized in a negative change in per capita GDP and reflected in the *ECON* variable at the first stage regression.

Table 4 shows the potential impacts of the COVID-19 pandemic on financial inclusion for remittance-receiving households. The impacts are measured in percentage changes in the proportions of a variety of indicators of financial inclusion out of those proportions in 2017. We will focus on financial inclusion where coefficients on remittance were positive and statistically significant in Table 3. First, looking at household financial inclusion, we observed that the proportion of households who have/use a bank account may be reduced by ranging from 2.2 percent ("With-COVID 3" in WB) to 4.0 percent ("With-COVID 2" in WB).

[29] The initial outlook by the IMF after the pandemic was released in April 2020 and updated in June 2020.

TABLE 4. Impact of COVID-19 on financial inclusion of remittance-receiving household

	Percent changes, IMF		Percent changes, World Bank		
	With-COVID 1	With-COVID 2	With-COVID 1	With-COVID 2	with-COVID 3
(1) Household financial inclusion					
Having a bank account	-2.63	-2.45	-2.62	-4.01	-2.20
Actively using a bank account	-2.66	-2.48	-2.65	-4.05	-2.22
(2) Women's financial inclusion					
Having any financial accounts	-2.02	-1.88	-2.02	-3.08	-1.69
Actively using any financial accounts	-2.07	-1.93	-2.07	-3.16	-1.73
Having a bank account	-3.43	-3.19	-3.41	-5.22	-2.86
Actively using a bank account	-3.44	-3.20	-3.42	-5.24	-2.87
Having a microfinance account	-3.49	-3.25	-3.48	-5.31	-2.91
Actively using a microfinance account	-3.49	-3.25	-3.48	-5.31	-2.91
Availing informal loans	10.22	9.51	10.37	15.85	8.68

Note: IMF: Scenario "no-COVID" is based on the IMF's projection of GDP in 2020 as of October 2019.
Scenario "With-COVID 1" is based on the IMF updated projections for per-capita GDP growth for 2020 as of June 2020, assuming a gradual recovery after the second half of 2020. Global growth declines by 4.9 percent in this scenario.
Scenario "With-COVID 2" is based on the IMF updated alternative projections for per-capita GDP growth for 2020 as of June 2020, assuming that the pandemic recovery is faster than the baseline projections of June 2020. Global growth declines by 4.4 percent in this scenario.
WB: Scenario "no-COVID" is based on the WB's projection of GDP in 2020 as of January 2020.
Scenario "With-COVID 1" is based on the baseline scenario in the WB's June 2020 growth forecasts, assuming that the lockdown lasts until the end of the second quarter of 2020. The global output declines by 5.2 percent in this scenario.
Scenario "With-COVID 2" is based on the downside scenario, assuming that the lockdown lasts until the end of the third quarter of 2020. The world GDP declines by 8 percent in this scenario.
Scenario "With-COVID 3" is based on the upside scenario, assuming prompt recovery after the second quarter of 2020. The world GDP declines by 4 percent in this scenario.

Those results imply that a substantial reduction in remittance inflows caused by the pandemic may have adverse effects on household financial inclusion. Second, we see that the negative effect is serious for women's financial inclusion. The negative effect would be a reduction of 1.7 percent ("With-COVID 3" in WB) to 3.2 percent ("With-COVID 2" in WB) for the proportion of having any financial accounts, a reduction of 2.9 percent to 5.2 percent-5.3 percent for a bank account or a microfinance account. Moreover, the reduction of remittance makes those households more dependent on informal loans.

We see that financial inclusion is likely to be negatively affected by the pandemic. By type of financial institution, the COVID-19 pandemic may slow down the propensity of households to have a bank account and a microfinance account. In other words, the COVID-19 pandemic may deprive the country of a driving force to advance financial inclusion in those financial institutions. The adverse effects may be large for those banks in the country that charge maintenance costs to account holders, such as minimum balance requirements and dormancy fees.

These can penalize small-amount savers and non-active users of bank accounts. For account owners with large savings, reduced income from remittances would not affect the probability of them keeping the account as they are still able to stay above the threshold below which the bank account becomes too costly to hold. However, for marginal account holders with small amounts of savings, the shock may push their balance below the threshold. Therefore, the true effects of reduced remittances on formal financial inclusion can be non-linear stemming from the costs of holding an account and we can speculate that the negative impact of COVID-19 on people's financial inclusion may be disproportionately harder for the poorer segment of account holders. At the same time, there has been a growth in new and inexpensive financial services that utilize Fintech to save, borrow, and remit money; these new financial services are a substitute for a bank account. The new cashless financial services include mobile money and online money transfer services where the transaction costs are lower than those of banks.[30] Therefore, while the COVID-19 pandemic may weaken the forces for promoting formal financial inclusion through traditional financial services, this negative effect can be partially offset by new cashless financial services that use Fintech.

The potential adverse impacts that we have discussed must be understood in conjunction with several reservations. The exercise depends on the relationship between remittances and per capita GDP in the destination countries, which served as an instrumental variable. In order to discuss the impact of the COVID-19 pandemic on financial inclusion, we summarized all of the serial and complex decision-making processes around migration into the receipt of remittances and all aspects of the virus outbreak in relation to international remittances within a change in per capita GDP; this may call for a more nuanced approach to international restrictions on travels and remittance transactions. Moreover, we use household data from rural regions in the Philippines prior to the outbreak, which does not represent the national average. We find that respondents in our sample are comparable to the 2018 National Migration Survey (NMS) of the Philippines and that the individuals in our sample are slightly older and the proportion of college attendees or graduates is higher. Lastly, our empirical approach may not be able to fully capture the impact of the pandemic. It may be a partial and immediate effect assuming that local factors such as local financial transactions and did not change so much before and after the emergence of the pandemic given the recent boom of cashless transactions.

[30] World Bank [2020d]

6. Conclusion

This paper examined the relationship between remittance and financial inclusion in the Philippines and explored the potential impacts of the COVID-19 outbreak on financial inclusion. The pandemic is detrimental to remittance flow to developing countries, which is considered a driving force in the promotion of financial inclusion. We confirm that remittances are associated with financial inclusion, especially for women, and discuss that a substantial decline in remittances as a result of the COVID-19 pandemic may have adverse effects on financial inclusion in the Philippines.

To our knowledge, there has been little research utilizing microdata to explore how the COVID-19 pandemic will affect household financial inclusion. Future research should use the actual data in migrant-sending countries after the COVID-19 outbreak to quantify the adverse effects on household financial inclusion. The literature on remittances and financial inclusion using household data is not vast. While it is not easy to conduct a survey during the pandemic, together with our results, this line of research will be very informative for future policy responses.

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