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The Propensity to Remit: Macro and Micro Factors Driving Remittances to Central America and the Caribbean

by Hussein Bidawi, Paola Aliperti F. Domingues, Chiara Fratto,
and Nicole Laframboise

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ABSTRACT: In contrast to expectations, remittances to Central America and the Caribbean (CAC) surprised positively during 2020 and 2021. This study revisits the key macro indicators driving remittances, looks at the heterogeneous impacts of the global financial crisis (GFC) and COVID shocks, then uses micro data from the U.S. Current Population Census to examine individual features of immigrant households and how this might affect the “propensity to remit”. The paper finds that remittance flows are responsive to both sending and receiving country economic conditions and that labor market conditions are particularly important determinants of remittance flows, explaining the unexpected jump in remittance flows in 2020-2021 and providing stronger predictive power when combined with income variables. Analysis of the micro data reinforces these findings, reflecting the existence of a family resource sharing model at play.

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Introduction

In contrast to expectations, remittance inflows to Central America and the Caribbean (CAC) surprised on the upside during 2020 and 2021.¹ The COVID-19 pandemic was raging by March-2020 and most countries around the world were entering a period of drastic contraction in economic activity and employment, including the U.S., the main source of remittance flows to the CAC region. In an attempt to predict the potential impact of this shock on worker remittances to the CAC, forecasts relied upon the relationship between sending country GDP growth and remittances—elasticities—to forecast expected flows to the region. These projections pointed to a sharp drop in remittances in 2020 of about 20-40 percent.

After an initial dip, however, worker remittances recovered mid-year and surpassed 2019 levels in many countries in the region. Given the magnitude of remittance flows and impact on the economy, this has renewed interest among economists and policymakers about the specific factors driving private transfers. Remittances from emigrants are one of the largest types of international financial flows. According to the World Bank, remittance inflows to low and middle-income countries amounted to over \$550 and \$540 billion globally in 2019 and 2020 respectively. This surpassed total inflows from foreign direct investment and other external current account inflows, and is large as a share of GDP, exceeding 5 (10) percent of GDP in 59 (34) countries in 2020 (World Bank). These trends are even more pronounced in CAC. The number of migrants from CAC represent at least 10 percent of the population of the region and are as high as 20 percent for the Caribbean (Beaton *et al* (2017), UNDP). Private transfers are equivalent to about 8 percent of GDP on average, while in some countries in our sample, like El Salvador and Honduras, remittances account for as much as 24 percent of GDP (World Bank, 2020).

Remittance flows of this magnitude clearly have a major impact on recipient economies, particularly on the balance of payments, domestic liquidity, the labor market, and the financial sector, to name a few. In this respect, being able to better predict inflows would be extremely useful for policymakers, including to estimate financing needs, monitor liquidity conditions and the impact on product markets, and assess the effects on financial sector stability. The large body of research on remittances focuses on their impact on recipient economies, the macro determinants in source (sending) countries that drive remittances, such as GDP growth and employment, as well as other structural factors like physical distance and the existence of a common border or language. While past estimates of the determinants and elasticities have been fairly robust, as noted above, these relationships proved to be weak predictors in 2020 and 2021. The stronger-than-expected volume of remittance flows might be explained by unusual factors, including the income support provided in the U.S. during the COVID pandemic. The dynamics of remittance flows at the peak of the COVID pandemic are explained nicely by the different impacts of COVID on labor market conditions in sending compared to receiving countries. A move from informal methods of sending remittances (cash) to formal methods (digital and recorded in the balance of payments) during the pandemic—related to the cessation of travel—is not found to play a role here.

To better understand recent trends, this study aims to review and re-estimate the macroeconomic factors affecting remittances in both sending and receiving countries and investigate the features of immigrant households—the diaspora—in the U.S. who are sending funds (*remitting*), drawing on micro data from the U.S.

¹ Refers to “worker remittances”, which is a subset of Private Transfers in BPM6; see Section IV for definition.

Current Population Census (CPS).² Characteristics such as the age, education, employment, and income of first- and second-generation immigrants from CAC are analyzed to assess their role and possible predictive value. The heterogeneous impacts of the global financial crisis (GFC) and the COVID-19 pandemic are studied, as is the role of the U.S. policy response to the COVID shock. The paper aims to better understand the forces driving remittances in order to improve the toolkit with which to anticipate and analyze flows. The study may also shed light on micro features of the immigrant population that could be of interest to U.S. policymakers. The study finds that remittance flows are responsive to economic conditions in the sending as well as receiving countries and that labor market conditions are particularly important determinants of remittance flows, explaining the unexpected jump in remittance flows in 2020-2021 and providing stronger predictive power when combined with income variables. Analysis of the micro data finds that higher levels of income and education are associated with stronger remittance flows. This reflects the existence of a resource sharing model in which family members living in two different countries share resources, although these relationships did not hold for the sample of all immigrants in the U.S.

The paper is structured as follows. Section II provides a survey of related literature. Sections III and IV present the data and stylized facts about remittance flows to CAC and the characteristics of migrants from CAC in the U.S. Section V looks at source country factors affecting remittance flows using a variance decomposition analysis to estimate how much of the observed variation in remittances is accounted for by variation in economic conditions in the U.S., notably during the COVID pandemic. Section VI estimates the impact of the COVID pandemic on employment status, income, and the likelihood to remit for migrants from each of the countries in the sample. Using microsimulations, the study relies on information on the industry and location-specific impact of COVID-19 on employment and income, compares the COVID-19 shock with the Global Financial Crisis (GFC) shock and assesses the role of the U.S. policy response on the propensity to remit. Section VII applies a discrete choice model of the characteristics of immigrants to estimate the likelihood to send cash (remit) based on individual-level features. Section VIII summarizes the findings, highlighting research and policy considerations and possible areas for further research.

Some Literature

The significant body of theoretical and empirical literature on remittances focuses on three areas: the developmental impact, the implications of remittances for economic cycles, and their macro determinants.

Development impact. Starting with impact, much work has examined the effect of remittances on goods markets, the risks of Dutch disease (Acosta *et al*, 2009; Barajas *et al*, 2011), and on labor markets. Remittances have been associated with higher personal consumption and lower poverty since they help smooth consumption and raise human and fixed capital (IMF 2005). Accordingly, they can lead to higher trade and consumption-based tax revenues and higher private savings which, if entering the banking system, help deepen the financial sector and can be used by banks to purchase government debt (Abdih *et al*, 2009, and Chami *et al*, 2006). Since remittances can increase the revenue base, several studies have proposed remittances-to-GDP or to-exports ratios as more appropriate measures of capacity to pay for debt sustainability purposes (IMF 2013).

²“To remit”: to send money in payment or as a gift. (Merriam-Webster)

As a non-market income transfer and alternative to labor income, remittances can have a significant impact on labor force participation, reservation wages, and occupational choices in receiving countries (Chami *et al*, 2018). They argue that high levels of remittances can spark a vicious cycle of economic stagnation and dependence; what they call a “remittance trap”.

Cyclical issues. Many papers examine the implications of remittances on the economic cycle in receiving countries, with mixed results. For instance, studies finding a negative correlation between business cycles include Bettin *et al* (2017) and Frankel (2011), whereby the countercyclical force of remittances is found to help smooth economic fluctuations and play a macro stabilizing role. Beaton *et al* (2017) examine this in the CAC region, finding that remittance flows play key financing and stabilizing roles by facilitating private consumption smoothing, supporting financial sector stability and fiscal revenues, and helping to reduce poverty and inequality.

On the other hand, some studies find that heavy reliance on remittances makes recipient countries more vulnerable to shocks in source countries (Barajas *et al*, 2012; IMF, 2012). In this instance, the larger the remittance flows between countries, the larger the business cycle synchronization and likelihood of negative spillovers to recipient countries. Similarly, Chami *et al* (2012) find that remittances have a negative effect on output growth volatility. Hosny (2020) tests further the relationship between remittances and the volatility of a wide range of external and real sector variables, finding that large remittances can be stabilizing on average but that high remittance concentration from source countries aggravates economic volatility in recipient countries. This could be particularly relevant for the CAC region since the majority of emigrants, particularly from Central America, are based in the U.S.

Determinants. With respect to the determinants of remittances, inflows have been linked not surprisingly to migration patterns since more migrants abroad leads to more disposable income to remit “home”. For example, Bettin *et al* (2017), Le Golf and Salomone (2015), Docquier *et al* (2012), and Frankel (2011) all find a positive association between the number of emigrants and remittance flows. Beaton *et al* (2017) find that migration and remittances respond to slow moving “structural” variables in the receiving country, including weak growth, conflicts and natural disasters.

Several studies using the gravity model to analyze the factors explaining remittances find that the standard determinants used in the trade literature nicely explain the dynamics of bilateral remittances. In particular, larger source countries tend to remit more, larger receiving countries to receive more, and country pairs with greater geographical distance to exchange less remittances (Leuth and Ruiz-Arranz, 2008; Abdih *et al*, 2012; Docquier *et al*, 2012). The elasticity of remittances to sending country GDP varies widely across studies, ranging between 0.25 – 3.9, and reaching the 5 – 10 range (Poghosyan, 2020).

The institutional characteristics of the receiving country and the existence of a common language or colonial ties have also been found to affect remittances. The latter two favor migration and play a key role (Leuth and Ruiz-Arranz, 2008; Docquier *et al*, 2012; Frankel, 2011; Abdih *et al*, 2012; Le Golf and Salomone, 2015). Several geographical characteristics examined include common borders and whether countries are islands or landlocked, with island countries found to receive more remittances (Frankel, 2011).

It is clear from the research that remittances have important implications for economic developments in recipient countries. As explained in the next section, this is especially so in the CAC region given the relative magnitude of inflows and concentration of emigrants in the U.S., among other things. While research on

elasticities has found generally robust results linking in particular flows to economic developments in source countries, these estimates proved less reliable when forecasting remittances in 2020 and 2021.³ This study thus contributes to the literature by re-evaluating macro relationships and, for the first time, using micro data on U.S. immigrants to examine possible factors underlying the “propensity to remit”.

Data

This section provides a description of the data used for the empirical analysis undertaken in this study. The analysis focuses on first- and second-generation immigrants in the U.S. (henceforth called “immigrants”) from CAC.⁴ For the demographic characteristics of immigrants, data is drawn from the Current Population Survey (CPS) from years 2000 to 2021, and Section VII only uses the supplement on remittances for the year 2008. This data is combined with data from the US labor force survey over the period 2000 to 2020 for estimates of unemployment rates and participation rates for each demographic group.

The CPS is a monthly household survey conducted by the U.S. Census Bureau for the Bureau of Labor Statistics and is the main source of labor force statistics for the population in the United States. Its sample size is about 60,000 occupied households in each month and covers the civilian noninstitutional population 16 years of age and older. The survey is conducted as follows: a sampled household is interviewed for 4 successive months, after an eight-month pause, and it is interviewed again for another four consecutive months before dropping from the sample permanently.

Though CPS data collection proceeded uninterrupted during the COVID-19 pandemic, data collection procedures were modified in the interest of safeguarding public health. Interviews for the household survey are normally conducted by phone or in-person, with in-person interviews conducted for families entering the sample in their first and fifth months. To preserve the safety of interviewers and respondents, the Census Bureau from March 2020 to June 2020 conducted interviews exclusively by telephone. In July, in-person data collection restarted in some localities, and in September 2020, personal visits resumed across the country.⁵ Due to these changes in procedures, response rates declined to 65 percent in June compared to 82 percent in February 2020. By October 2020, the total response rate had recovered to 80.3 percent, close to the previous annual average.

Remittance flows to countries in the sample are recorded at an annual or quarterly frequency, depending on data availability. According to the sixth IMF Balance of Payments Manual (BPM6), remittances are mostly derived from the following two items in the balance of payments: (1) income earned by workers in countries in which they are not resident or from nonresident employers (compensation of employees) and (2) all current transfers in cash or in kind from residents of one country to residents of another country (personal transfers). According to the IMF, personal transfers replace a standard item called “worker’s remittances” in the previous Balance of Payments Manual (BPM5), though “worker’s remittances” are included as a supplementary item in

³ For other research on the dynamics of remittances during the pandemic, see Babii et al (2022), and Kpodar et al (2021), which include analyses of the US temporary fiscal stimulus and the evolution of the pandemic.

⁴ Countries in the sample: Anguilla (AIA), Antigua and Barbuda (ATG), Aruba (ABW), Bahamas (BHS), Barbados (BRB), Costa Rica (CRI), Dominica (DMA), Dominican Republic (DOM), El Salvador (SLV), Grenada (GRD), Guatemala (GTM), Guyana (GUY), Haiti (HTI), Honduras (HND), Jamaica (JAM), Mexico (MEX), Montserrat (MSR), Nicaragua (NIC), Panama (PAN), St. Lucia (LCA), St. Vincent and the Grenadines (VCT), St. Kitts and Nevis (KNA), Suriname (SUR) and Trinidad and Tobago (TTO).

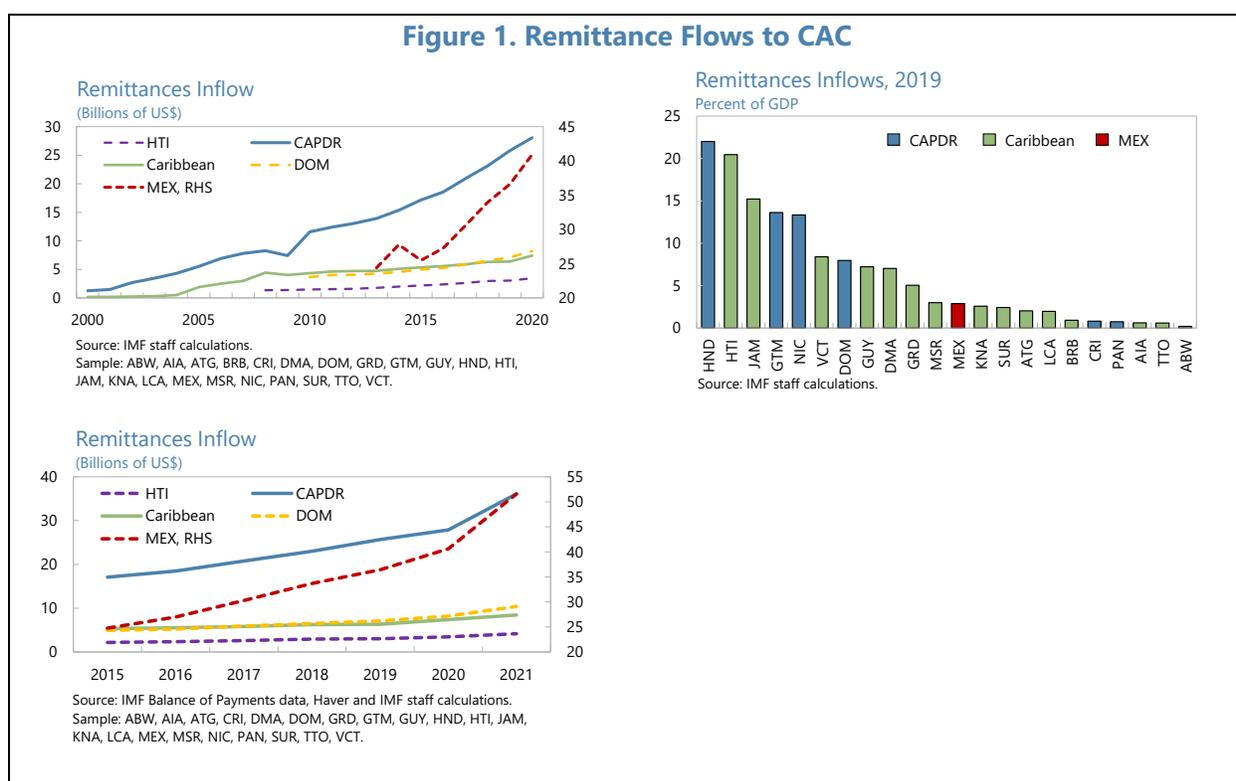
⁵ In-person interviews were resumed only after efforts to reach households by telephone had failed.

BPM6.⁶ In the BPM5 framework, the components related to remittances were compensation of employees, worker's remittances, and migrants' transfers.

This study uses different definitions based on data availability by country. Henceforth the term “remittances” is used broadly to refer to all definitions.

Demographic Characteristics of Immigrants and Remittances

This section provides stylized facts on trends in remittance flows to CAC and presents an overview of the demographics of first- and second-generation immigrants from CAC to the U.S. It analyzes cross-sectional differences between the countries and the cyclical patterns over the period 2000-2020.



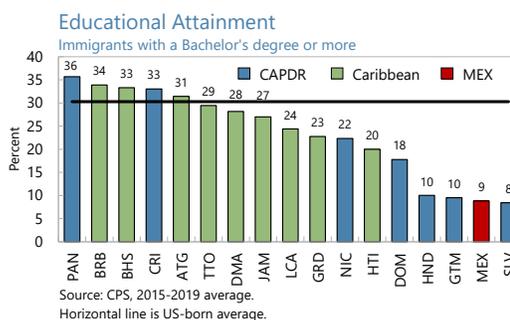
Remittance flows have increased steadily over the last 20 years and now constitute an important share of GDP in CAC. Remittances are considered to have been important drivers of growth in receiving countries and an important mechanism for smoothing business cycles, supporting consumption during slumps, and even providing a source of fiscal revenues.⁷ The importance of remittances varies widely across the region, with countries like Haiti and Honduras receiving remittances amounting to more than 20 percent of GDP in 2019, as compared to Panama, Costa Rica, and Anguilla, where remittances account for 1-2 percent of GDP annually.

⁶ IMF (2009).

⁷ Abdih et al. 2012

Education Characteristics of Immigrants from CAC

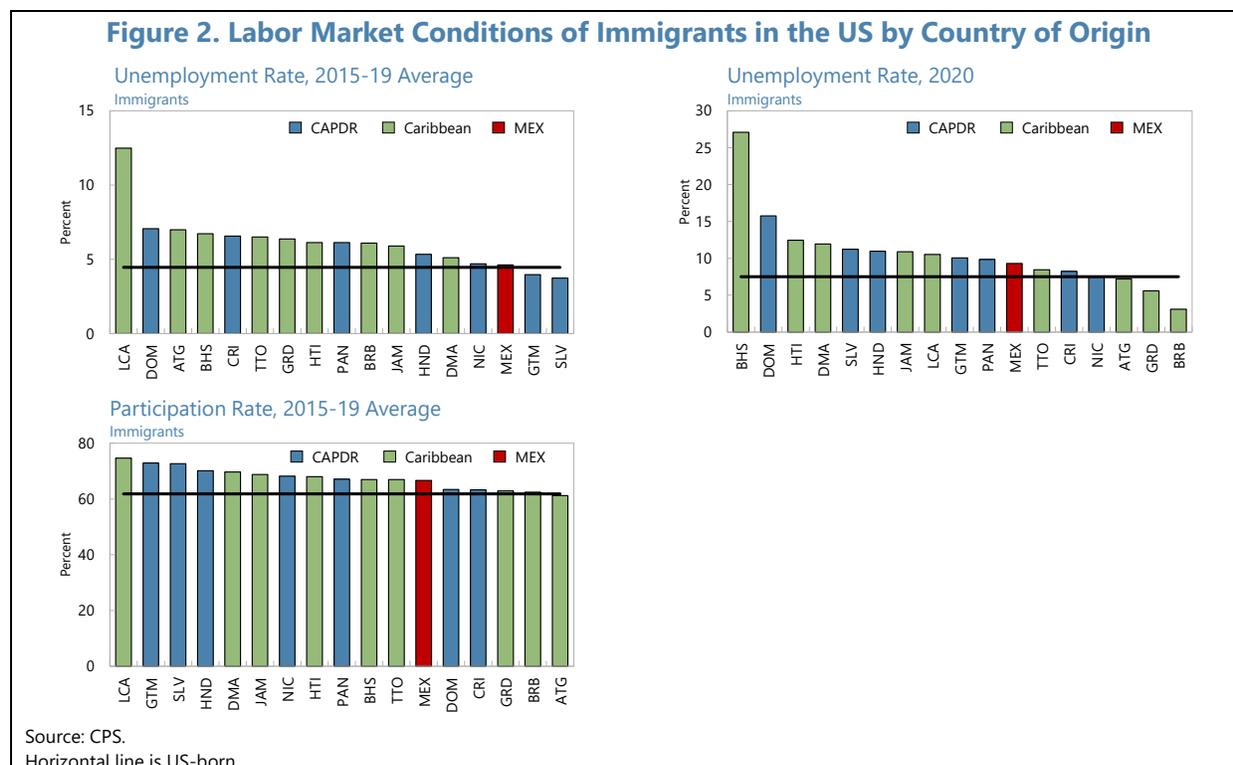
While on average, immigrants from CAC are less likely than U.S.-born⁸ to have a bachelor's degree or higher, there are important exceptions, particularly among Caribbean immigrants, where the education attainment of immigrants on average exceeds the average level for US-born persons.



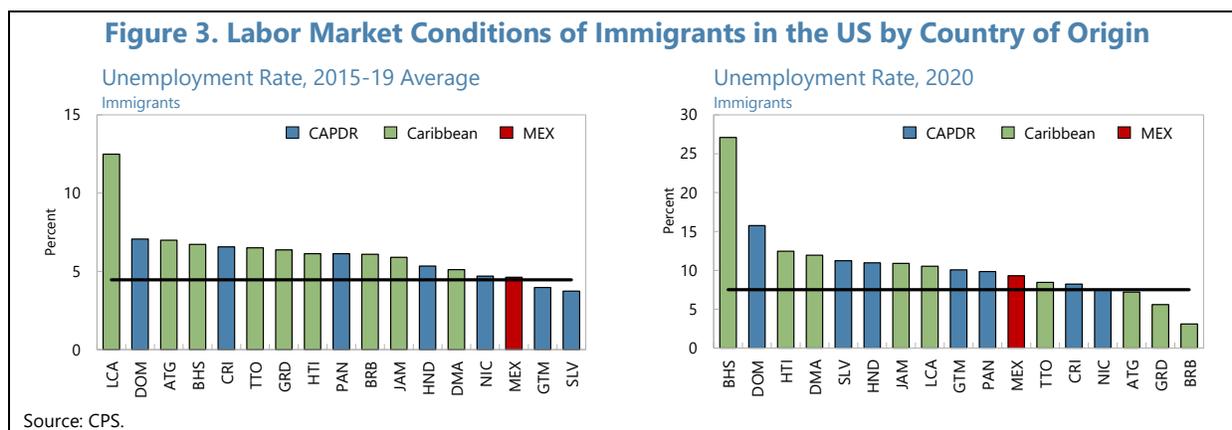
Interestingly, there is a negative relationship between remittances as a share of GDP in the receiving country and the level of educational attainment of nationals from that country living as immigrants in the U.S. The relationship between remittance flows in receiving countries and the levels of income and education of emigrants from those nations in the U.S. is explored later in the paper.

Labor Market Features of Immigrants from CAC

With rare exceptions, the unemployment rate is higher for immigrants than it is for US-born persons, regardless of the level of education. At the same time, labor force participation rates among these groups are mostly higher. Indeed, the employment rate, i.e., the fraction of the full labor force currently employed, is typically higher for immigrants than for US-born persons because the participation rate is higher for the former.



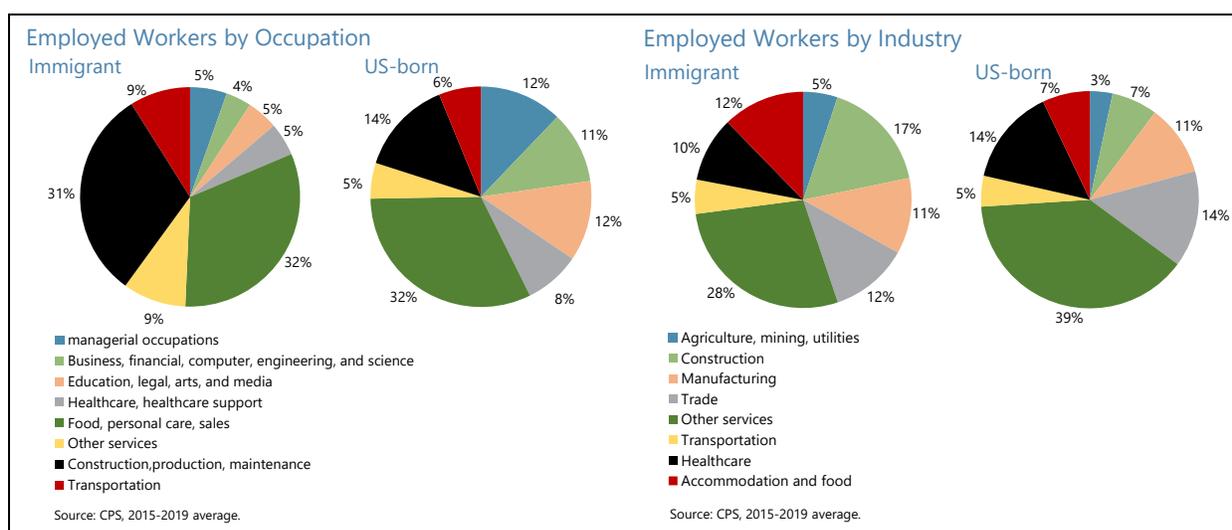
⁸ For simplicity and consistency in terminology, US-born refers to individuals born in the U.S. from parents also born in the U.S., while the term immigrant refers to first- and second-generation immigrants, i.e., people born abroad or descendants of parents born outside the U.S.



Looking at cyclical characteristics, unemployment rates among immigrants display a more pronounced cyclical pattern than those for U.S.-born workers, with unemployment rates for immigrants converging towards the U.S. average during booms and diverging during recessions. This suggests that immigrant workers lose employment at a disproportionate rate during recessions. The COVID-19 shock was no exception, with the U.S. unemployment rate reaching 8.1 percent in 2020 on average compared to 9.3 percent for workers born in Mexico and 12 percent for workers born in Haiti. It should be noted that the unemployment rate might underestimate the impact of the pandemic on the labor market overall because containment measures taken to limit the spread of COVID might have prevented job search or made it harder to look for a job.

The data indicates that the risk of losing one's job is relatively higher for immigrants. COVID-19 was no exception, with only immigrants from Nicaragua, Trinidad and Tobago, Guyana, and Barbados faring better than the average among US-born citizens.

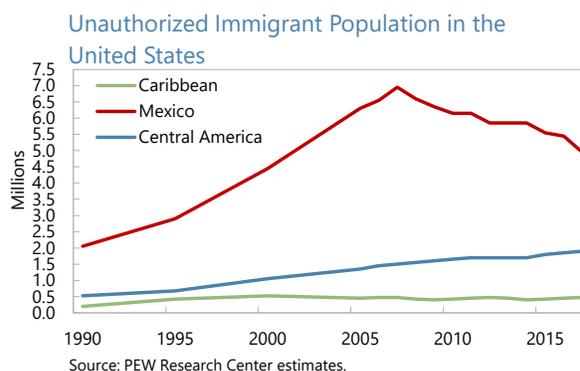
Immigrants in the U.S. are less likely than US-born persons to be employed in managerial positions, and more likely to be employed in jobs where it is more difficult to telework, such as construction, and transportation.



As seen in the pie charts, immigrants are more likely than U.S.-born persons to be employed in hospitality (accommodation and food), sectors heavily affected by the COVID-19 crisis due to the in-person nature of the work; they are less likely to be employed in other service-related sectors.

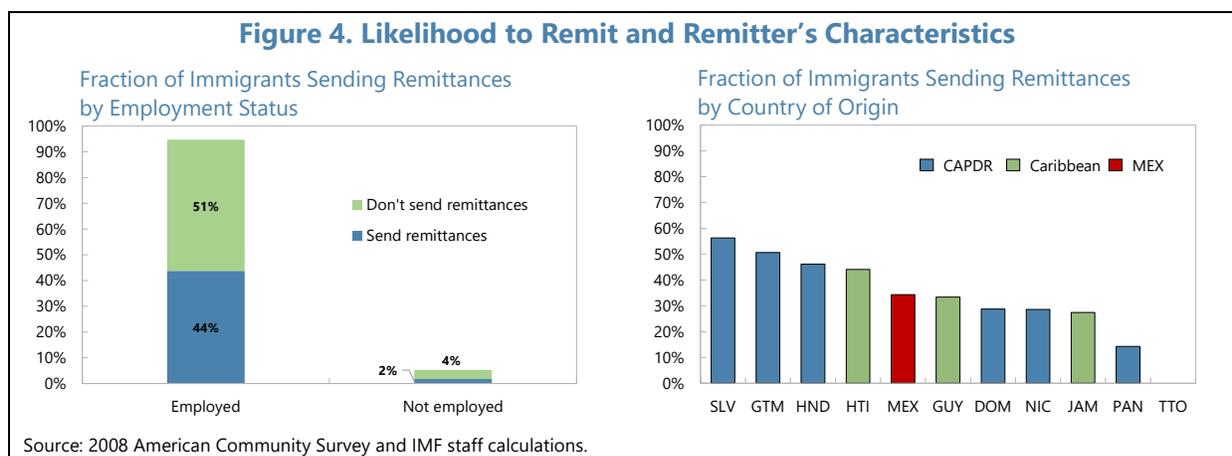
Both the type of sector in which immigrants are employed and the type of occupation contribute to explaining the larger impact of the COVID-19 shock on these demographic groups and their higher sensitivity to the business cycle. High employment levels in the construction industry, a highly cyclical industry, also contributes to explaining the strong cyclicity of unemployment rates among first- and second-generation immigrants.

In addition, there are a large number of unauthorized immigrants in the U.S. without formal immigration documents. These are workers typically more exposed to the swings of the business cycle. Pew Research estimates that unauthorized immigrants constitute 4.8 percent of the labor force. The number of unauthorized immigrants from Central America has been increasing steadily, from 0.5 million in 1990 to an estimated 1.9 million in 2017. In contrast, the stock of unauthorized immigrants from the Caribbean has remained relatively steady since 1990, hovering around 0.5 million.⁹



These data present some indicators on the education and employment of migrants from CAC living in the U.S. and suggest that recessions in the U.S., and in particular the COVID-19 pandemic, have a disproportionate adverse impact on the population of immigrants, including from CAC. This is one reason that forecasters had expected a sharply reduced stream of remittance flows during the pandemic (in 2020), given the expected severe impact of the COVID-related “shutdowns” on employment and incomes in the U.S.

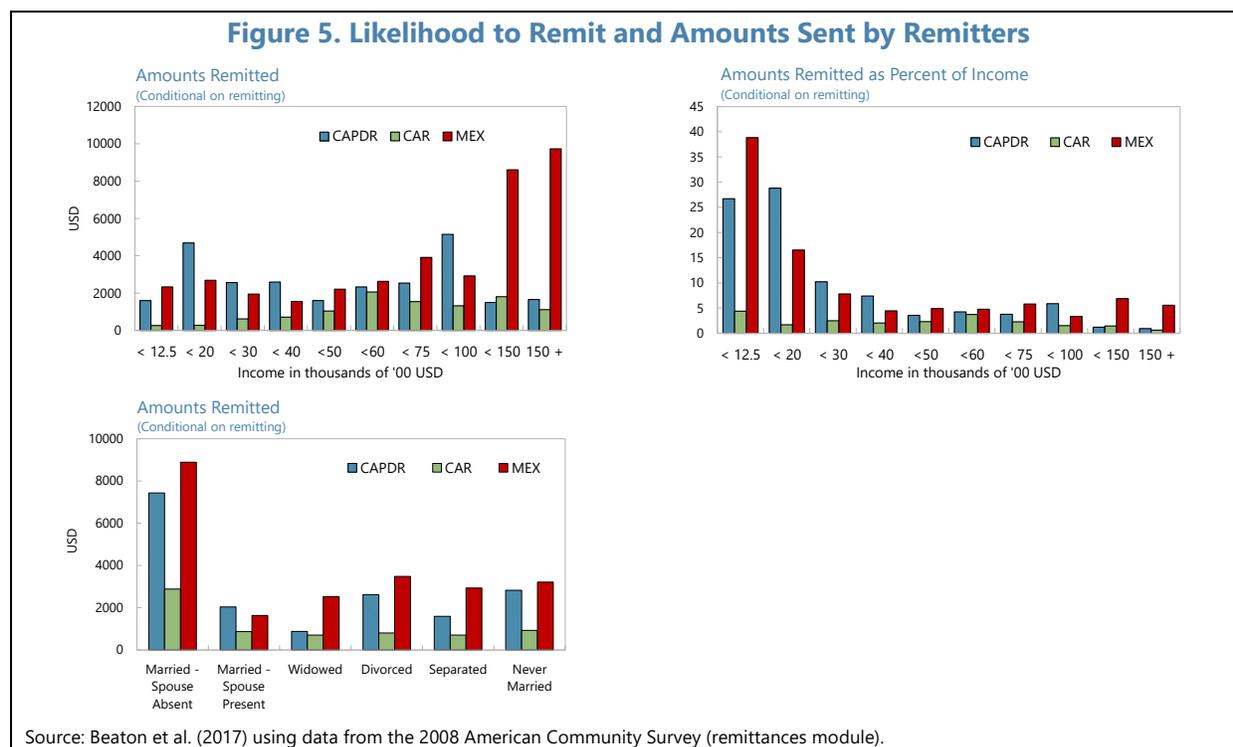
Additional Features of Remitters



⁹ Source: Pew Research Center estimates based on augmented U.S. Census Bureau data.

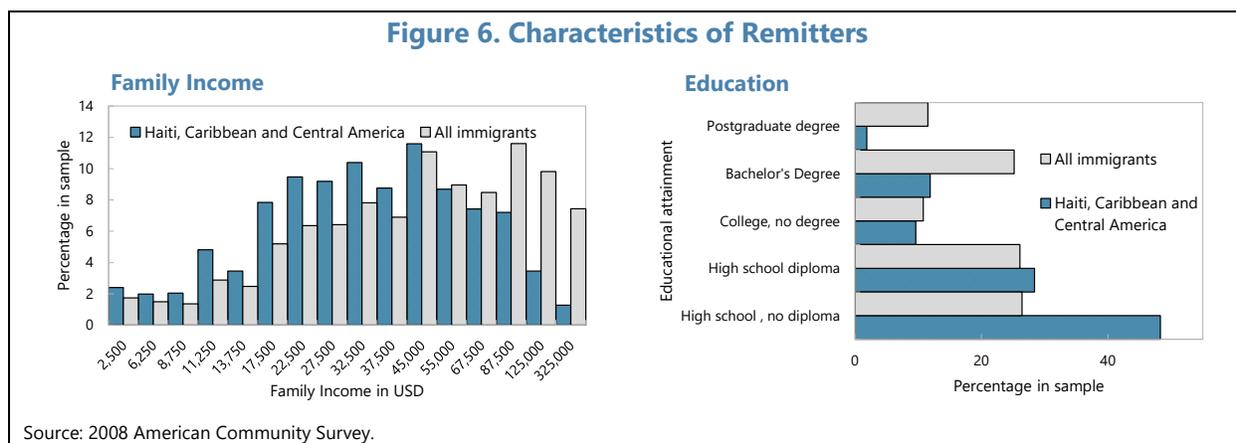
While on average, individuals send home 5.4 percent of their income (ACS, 2008 remittances module), people from Central America and Mexico send a larger amount than people from the Caribbean, both in absolute terms and as a share of their income. For instance, Mexican immigrants send 24 percent of their personal income home as remittances when they earn US\$12,500 or less (US\$, 2008), compared to people from the Caribbean who send only about 1.4 percent of their household income on average. The share decreases and reaches 5 percent and 0.2 percent respectively at higher income levels.

Conditional on remitting, married people with a spouse absent send a significantly larger amount of money than do others.



Two stylized facts emerge from comparing the immigrants from Haiti, the Caribbean and Central America with the sample of all countries. On the one hand, immigrants from this region have lower income than the average of all immigrants. In the ACS 2008 remittances module, immigrants from this region earn an average of 44,000 USD per year, while the overall average is 72,000 USD. On the other hand, immigrants from this region have lower educational attainment, with 48 percent having some years of high school education, but no diploma, compared to 26 percent for the whole sample of immigrants.

This paper aims to understand the effect of such individual characteristics on the likelihood to remit funds as well as the amounts sent. One would expect a positive direct relationship between income and remittances, since the availability of income allows for the possibility to help one's family and friends by sending funds. However, this is nuanced by an indirect channel, whereby higher income from skilled jobs and higher educational attainment signal that the migrant's family may already be relatively wealthier and less in need of funds. Further, it would be interesting to explore possible heterogeneity in the relationship between income and remittances at different levels of incomes.



Sending Country Factors Affecting Remittance Flows

The pandemic was an unprecedented global shock affecting both senders of remittances and receivers. As seen in the literature, remittance flows are typically positively correlated with growth (GDP, per capita income, etc.) in sending (source) countries. This section reviews that relationship for the CAC sample and estimates how it is affected by developments in the receiving country and other key economic factors in both receiving and sending countries that are associated with remittances inflows.

Broadly speaking, remittance flows depend on the ability of remitters to send money, namely factors related to the economic conditions in the sending country, the needs of the recipients, including the economic conditions in the receiving country, and the cost of sending funds, including transactions costs and differences in purchasing power due to fluctuations in the exchange rate and inflation in both receiving and sending countries).

Remittance flows in receiving countries are regressed against macroeconomic factors in those countries and in the sending country—the U.S., with country fixed effects. The regression equation:

$$R_{j,t} = R_{j,t-1} + \alpha_j + \beta X_{it} + \gamma X_{jt} + \varepsilon_{ijt}$$

where $R_{j,t}$ represents remittances of country j in time t , X_{it} are sending-specific factors, X_{jt} are receiving-country specific factors, and α_j are receiving-country fixed effects.

The sample is restricted to CAC countries for which the U.S. economy is the main source. While a causal inference on these relationships cannot be made due to endogeneity concerns, the findings in this section points to a strong relationship between economic conditions in the source country, most notably developments in the labor market, on patterns in remittance flows.

Results

The analysis find that remittances rise more when U.S. economic growth is stronger and when the receiving country is weak or growing more slowly (weaker). The difference in the coefficients of the growth rates in the sending and receiving countries suggests that remittance flows are more responsive to sending country economic conditions than to those in the receiving country.¹⁰ In terms of magnitudes, a 1.0 percentage point increase (decrease) in GDP growth in the U.S. (receiving country) translates into 16 (4) percentage points increase in remittances as a percentage of GDP. On the other hand and taking into account that receiving country economies are typically more volatile than the U.S., a one standard deviation increase (decrease) in GDP growth in the U.S. corresponds to a 16 percentage points increase (decrease) in remittances as a percentage of GDP, a one standard deviation increase (decrease) in GDP growth in the receiving country corresponds to a 28 percentage points decrease (increase) in remittances as a percentage of GDP. While the bilateral exchange rate and inflation in both countries capture changes over time in the purchasing power of remittance flows, the results suggest that these factors do not affect the decision to send funds.

Table 1. The Role of GDP Growth in the Sending and Receiving Country

VARIABLES	(1)	(2)	(3)	(4)
	Remittances %GDP	Remittances %GDP	Remittances %GDP	Remittances %GDP
US GDP growth	16.68*** (4.714)	16.81*** (4.823)	17.31*** (5.004)	18.12*** (5.604)
GDP growth in receiving country	-3.636*** (1.035)	-3.689*** (0.976)	-3.661*** (1.117)	-3.228** (1.201)
Bilateral exchange rate		-0.00332 (0.0172)	-0.00337 (0.0173)	-0.0026 (0.0161)
Migrant stock USA			8.15e-08 (4.86e-07)	3.70e-07 (4.62e-07)
US inflation				-0.0481 (0.0730)
Inflation in receiving country				0.0238 (0.0231)
1-year lag Remitt %GDP	0.831*** (0.0333)	0.835*** (0.0265)	0.832*** (0.0303)	0.823*** (0.0291)
Observations	325	325	306	306
R-squared	0.76	0.76	0.759	0.761
Number of receiving countries	22	22	21	21

Note: Annual data for the years 2001-2019. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

¹⁰ Using the difference in GDP growth between the US and the receiving country as a regressor confirms these results.

Remittances are positively correlated with household income among immigrants, which in turn is correlated to economic conditions in the sending country (U.S.).

Table 2. The Role of Family Income of Remitters

VARIABLES	(1) Remittances %GDP	(2) Remittances %GDP	(3) Remittances %GDP
US GDP growth	18.12*** (5.604)		15.92** (6.010)
Family income first- and second- generation (growth)		5.812** (2.157)	2.992 (2.340)
Observations	306	306	306
R-squared	0.761	0.749	0.763
Number of receiving countries	21	21	21

Notes: Controls include GDP growth in the receiving country, bilateral exchange rate, stock of immigrants in the U.S., CPI inflation in the U.S. and in the receiving country, one-year lag of remittances as a percentage of GDP and receiving country fixed effects. Annual data for the years 2001-2019. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3 presents results showing how changes in unemployment rates in both countries affect remittance flows. In particular, the differential in the unemployment rate of immigrants in the U.S. and the overall rate in the receiving country is significantly and negatively correlated with remittance flows, even when conditional on the differential in unemployment rates between the average worker in the U.S. and that in the receiving country. Column (4) clarifies that both the unemployment rate among immigrants and the GDP growth differential are relevant factors affecting remittances. This finding suggests that analyzing labor market conditions, particularly among immigrants in the U.S., is an important complement to GDP elasticities when estimating and forecasting remittance flows.

In periods during which labor market trends are decoupled from economic activity, as happened during 2020 when the drop in output was less pronounced than for employment, the overall impact on remittances is ambiguous.

Table 3. The Role of Unemployment Rate Differences and GDP Growth Differences

VARIABLES	(1) Remittances %GDP	(2) Remittances %GDP	(3) Remittances %GDP	(4) Remittances %GDP	(5) Remittances %GDP
Diff in unemp rate changes between US and receiving country	-0.0617** (0.0259)		-0.0039 (0.0182)		
Diff in unemp rate changes between US foreign-born and receiving country		-0.0783** (0.0344)	-0.0775* (0.0355)		-0.0557* (0.0287)
Diff in GDP growth between US and receiving country				5.177* (2.339)	4.132* (2.009)
1-year lag remittances %GDP	0.782*** (0.0368)	0.790*** (0.0335)	0.790*** (0.0344)	0.824*** (0.0420)	0.825*** (0.0400)
Observations	133	133	133	133	133
R-squared	0.817	0.829	0.829	0.834	0.841
Number of receiving countries	10	10	10	10	10

Notes: the unemployment rate for "US foreign-born" is defined as the annual average unemployment rate among immigrants (i.e., first- and second-generation migrants from CAC countries). Controls include: GDP growth in the receiving country, bilateral exchange rate, stock of immigrants in the U.S., CPI inflation in the U.S. and in the receiving country and receiving country fixed effects.¹¹ Annual data for the years 2001-2019. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

The results show that labor market conditions are particularly important determinants of remittance flows. As wage earnings are the main source of income for immigrants in the U.S., it makes sense that labor market conditions would strongly affect overall immigrant household income and hence remittance flows. Moreover, it is the unemployment rate in the sending country *relative* to the unemployment rate in the receiving country that is the important factor. The unemployment differential is a rough proxy of the difference in income between the family members split between the sending and the receiving countries. The significance of this variable in the regression confirms the resource sharing model in play, in which family members living in two different countries share resources. As labor market conditions in the receiving country deteriorate relative to the U.S., remitters will be more likely to send funds. That the GDP growth differential remains significant after controlling for the unemployment rate differential suggests that the employment status is only part of the story.

This section examined the relative importance of some key macroeconomic conditions in sending and receiving countries for remittance flows, in particular the relevance of labor market conditions and developments in income among immigrants in the U.S. The results show that remittance flows are estimated to be as responsive to sending country economic conditions as they are to conditions in the receiving country. In addition, labor

¹¹ The table uses data on unemployment from the IMF. Using ILO STAT does not alter the results.

market conditions are found to be important determinants of remittance flows and, when combined with growth variables, can provide stronger predictive power than relying exclusively on income developments.

COVID-19 vs. The GFC Shock: Remittances Response

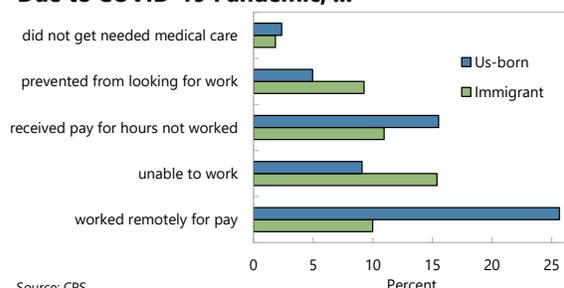
When investigating the seemingly unusual behavior of remittances during the COVID pandemic, it could be useful to contrast that outcome with what happened during the last big global shock, the 2008-2009 global financial crisis (GFC).

During the pandemic in 2020 there was an extraordinary disruption of economic activity, with average unemployment in the U.S. reaching unprecedented levels. Employment fell even more as many people were not able to look for work due to the containment measures put in place.

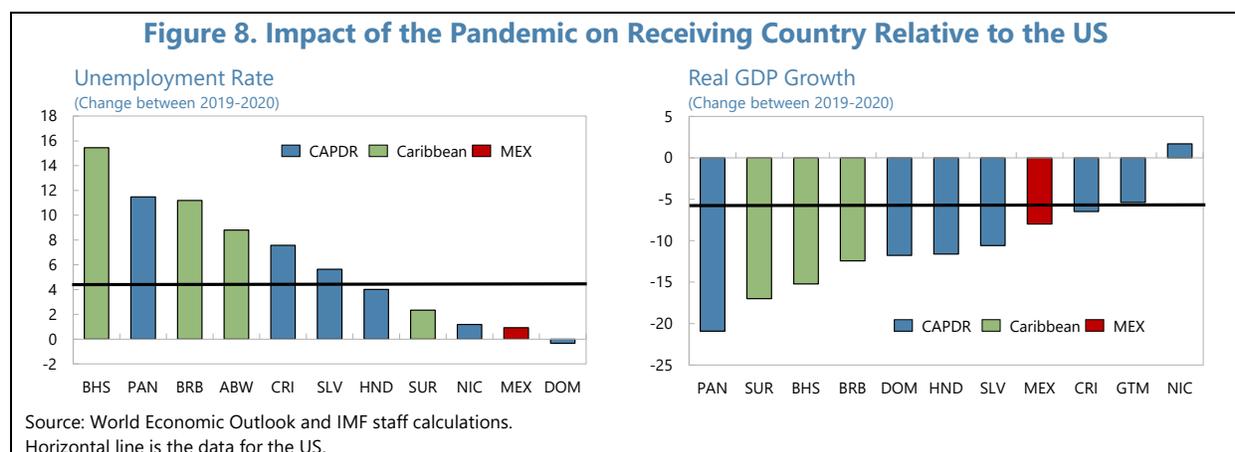
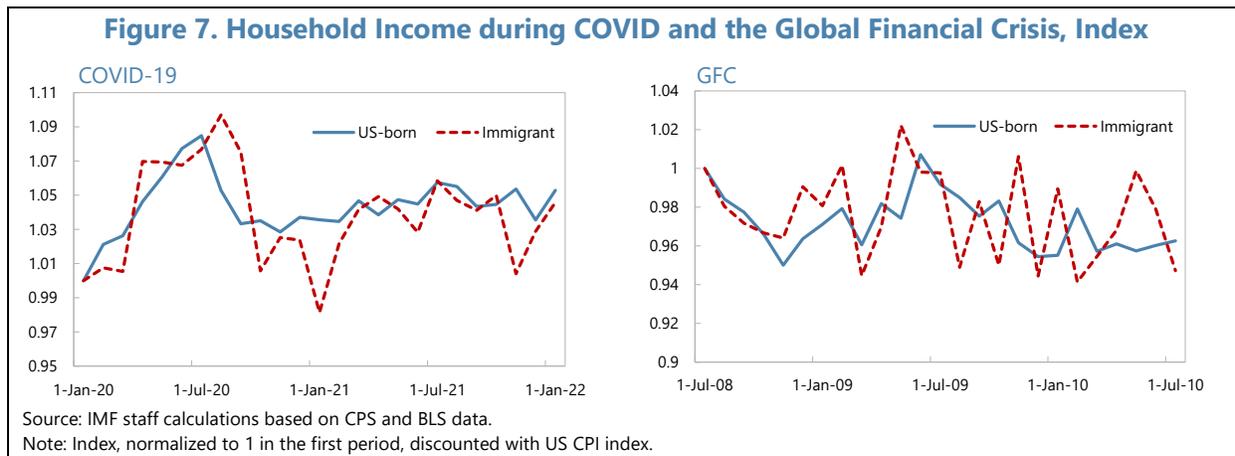
The questions asked by the CPS during the pandemic provide the following useful details on labor market conditions: first, immigrants were less likely than US-born persons to work from home during the pandemic; they were less likely to be able to work because of COVID-19; they were less likely to receive pay for hours not worked and less likely to receive medical care; and their ability to look for a job was relatively more hindered by COVID-19. Pandemic lockdowns closed most of the service sectors, where immigrants have higher representation, and the informal sector. For example, in a sample of ten emerging market countries with available data, informal employment losses were two to three times larger than job losses among formal employees in mid-2020 and, in contrast to job losses among formal employees, they were not fully reversed by mid-2021 (ILO 2022).

However, in the U.S., nominal household income grew significantly for both the US-born and immigrants a few months into the pandemic, peaking in July 2020. Average household income had increased by 7 percent in real terms around July 2020 for both groups. As labor market data indicate that the pandemic was worse for immigrants because of its impact on the service sector, the increase in household income in mid-2020 for both groups could be related to the impact of the large and quasi universal income support measures implemented in the U.S. and a drop in informal employment (implying a switch for some to the formal sector). This offers a partial explanation for higher remittances in 2020 (in addition to the possible shift of flows to formal channels as noted earlier).

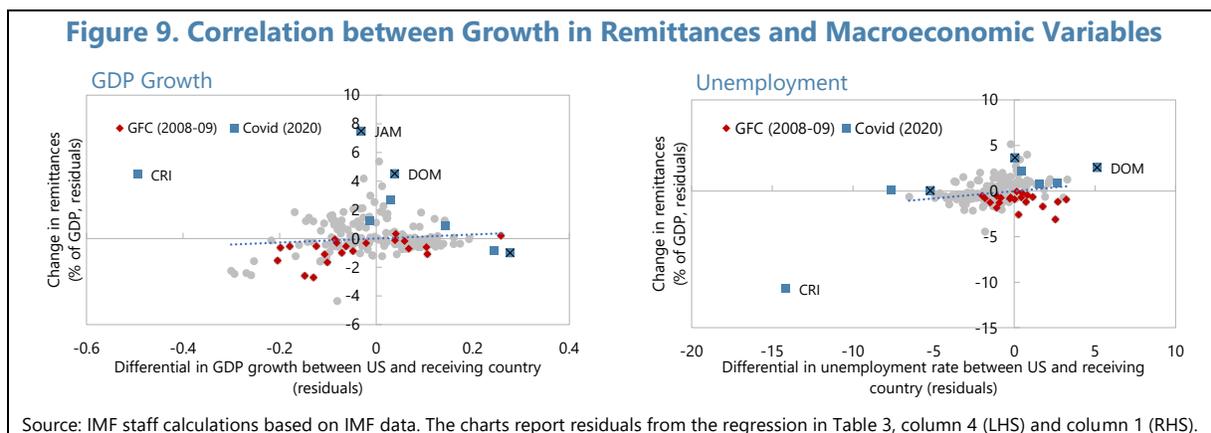
Due to COVID-19 Pandemic, ...



Source: CPS.
Observations are from May-20 to Dec-20.



The relation between changes in remittances and the differentials in GDP growth rates and unemployment rates between sending and receiving countries are plotted in Figure 3. How well the model predicts the global financial crisis (GFC, 2008-2009) and the COVID shock (2020) is compared. Looking at the relationship between GDP growth differentials and remittance growth rates, the chart on the left of Figure 3 depicts the puzzle many observers faced during the COVID shock: remittances increased significantly more than what would have been predicted by GDP data according to estimated elasticities.



The right chart presents data on the relationship between differentials in unemployment rates and changes in remittances, which appears to capture both the dynamics in remittances during the GFC and during COVID. This is particularly noteworthy given the poor performance of unemployment measures during the pandemic, when the labor force dropped dramatically. Nonetheless, as the results from Section V suggest, the unemployment differential with the U.S. drives remittances: countries where the unemployment rate fell more than in the U.S. saw an increase in remittance flows, highlighting again as a key factor the risk sharing channel at play between immigrants and their families. The chart confirms the importance of looking at labor market conditions, both in the sending and the receiving countries, when trying to understand dynamics in remittances.

Lastly, the charts in Figure 3 plot island nations (with crosses) to distinguish them from non-island nations in the sample. Because islands are generally reached by air, they might be more affected by the border closures that occurred during the pandemic. Comparing island countries to others could provide insights into whether there was a large shift from informal (cash) remittances to formal (digital and traceable) methods of funds transfers and if this played a role in boosting recorded remittances during the pandemic. This approach—using island nations as a proxy to measure a structural increase in formal remittance flows—has limitations: for example, moving cash by sea is still possible, particularly when islands are close to the mainland. Nonetheless, this addition strengthens the model specification and provides a robustness check on the estimates of macro drivers of remittance flows. If changes in remittances were mostly due to this switch in method of transfer, remittances to island countries would likely be better predicted by observed macro variables, while remittances to non-island nations with less well-defined borders would be expected to deviate from the established relationship to macro variables and be driven instead by the unexplained component (the residual) of the regression. That said, no systematic relationship is found between island country status and the residual, which suggests that the findings above on the role of the employment differential in capturing the willingness to remit is robust to the switching channel.¹²

The next section digs deeper into individual characteristics that might explain the likelihood to remit funds.

Individual Features that Affect Propensity to Remit Funds

The aim of this section is to identify individual characteristics of immigrants that affect the likelihood to send funds, or “propensity to remit”. The roles of labor market conditions, skill levels, years of schooling, gender, marital status, country of origin, and other regional factors are explored. The empirical approach uses a discrete choice model that seeks to understand the determinants of the likelihood to remit, as well as a linear regression model to study the amounts remitted.

The Current Population Survey (CPS) covers the universe of all persons, civilian and military, of the U.S. population. The sample in this section excludes: (i) every person born in the U.S. and whose mother and/or father were born in the U.S., (ii) those born abroad to American parent(s), (iii) every person not in the formal labor force and (iv) every person aged 14 or below. This analysis is based on an immigration/emigration Supplement to the 2008 CPS.

¹² For a different approach that addresses the issue of switching from cash to formal methods to remit, see Babii et al (2022).

All Migrants

The empirical exercise that is prepared includes an analysis of the “head of the household” characteristics and on overall household characteristics.

A logit model is set up for the likelihood to remit based on individual-level characteristics of the head of household. These comprise:

- the age of the head of the household, as well as age squared, to capture non-linear effects;
- gender, for which a dummy variable is used;
- marital status: two dummies are used, one for married with the spouse present, and another dummy for married with spouse absent; the reference group is thus the unmarried;
- education level: four dummies are used representing (i) obtained a high school degree, (ii) attended college but did not obtain a diploma, (iii) obtained a college degree, and (iv) received a postgraduate- degree; the reference group does not have a high school diploma;
- employment status for which a dummy is used: the head of the household is employed, and the reference group is both the unemployed or outside the labor force.

Supplementing the head of household characteristics, we study the effect of the income of the household¹³ on the probability of sending funds, since we only observe income at this level of disaggregation. We further include the following household characteristics to check the robustness of our results: size of the household and a dummy for household location (metropolitan area).¹⁴ Lastly, we estimate both our baseline regression and robustness specification with and without weighting the observations by household weights of the CPS.

Results

The results are presented in the tables 4a and 4b. The education level of the head of the household is found to significantly and inversely affect the likelihood that someone in the household will send funds to their family or friends abroad. The more educated the heads of the household are, the less likely they are to send remittances. This is true for every level of education: persons with some years of high school but no diploma are the most likely to send funds while people with postgraduate degrees are the least likely.

The education level is positively correlated with higher skilled jobs and income, characteristics that are likely to be persistent across generations, yet it is not immediately clear why these persons send less in both relative and absolute terms.¹⁵ Interestingly, and at odds with the finding in Section V, where remittances were positively correlated with immigrant household income, the household income variable is not statistically significant in the logit model, as shown in the regression table below. Possible explanations are that the education level of the head of the household reflects characteristics of that person’s family network: (i) in the host (sending) country, where more educated immigrants may already have more or most of their family present, and/or (ii) in the

¹³ The CPS 2008 supplement asks about the family income, and whether anyone in the household has sent funds to friends or family abroad. In this paper, we use the term household throughout for consistency.

¹⁴ Note that one can include household characteristics in the individual level regression, but not vice versa.

¹⁵ The CPS has questions on occupation and sectors. The authors have extended the regression to include those, but the results were not significant. This could be due to the small sample of non-US citizens in the CPS.

receiving country, where their level of education may reflect that they come from families with relatively higher wealth and income. Regressing the remittances dummy only on income shows a negative and statistically significant relationship, however the statistical significance quickly disappears once education is included. This does not contradict the substitutability of income and education in explaining the likelihood of sending funds.

Household size significantly increases the likelihood of sending remittances, whereas age, employment status, and location (metropolitan or rural area) do not.¹⁶ Men are more likely to send funds than women, and this is further dependent on marital status, particularly when the spouse (wife) has remained in the country of origin.¹⁷ It should be noted that there is not enough variation in the sample with respect to employment, with 93 percent of the sample employed, and marital status, with 73 percent of the sample married with the spouse present, to assess with certainty their effects on the likelihood to send funds. This limitation in the data is noted in the results.

Next, the determinants of the amount of funds remitted are examined—conditional on sending remittances.¹³ The total amount sent by each household is regressed on the characteristics of the head of the household noted above (employment, education, marital status, gender, and age) as well as the characteristics of the household (income, household size and metropolitan area). Similar to the previous exercise, the household weights of the CPS are used to verify the robustness of the results.

The findings show that, conditional on remitting funds, the higher the income of the household, the larger the amount sent in remittances. The estimated elasticity is about 0.25-0.30, i.e., a 1.0 percentage point increase in income results in an increase of around 0.25 percentage points in remittance funds sent. More tertiary education has a positive effect on the amount remitted, possibly reinforcing the income channel described above. While more education in the previous full sample results made it less likely that U.S. immigrants would send funds, when conditional on sending remittances, immigrants with more education send significantly larger amounts than those with lower levels of education.

Lastly, men send higher amounts of funds than women, on average. This could be explained by the presence of more men in the sample whose spouses (wives) have stayed in the receiving country, possibly with their families, and who rely on remitted funds as income, than the other way around.

¹⁶ The results would be similar if other employment variables (part/time full, and hours worked) are used.

¹⁷ Removing gender from the regression makes the marital status dummies more significant, confirming that they are picking up the same economic factor.

Table 4a. All Migrants

	(1) Remit Dummy ¹	(2) Remit Dummy	(3) Remit Dummy	(4) Remit Dummy
Family income ²		0.0493 (0.89)		0.0633 (1.08)
Employment status ³	0.204 (1.29)	0.143 (0.79)	0.287 (1.66)	0.259 (1.32)
Education ⁴ level d1	-0.489*** (-4.76)	-0.464*** (-3.90)	-0.468*** (-4.24)	-0.475*** (-3.75)
Education level d2	-0.408** (-3.02)	-0.388* (-2.49)	-0.400** (-2.68)	-0.409* (-2.40)
Education level d3	-0.468*** (-4.49)	-0.396** (-3.08)	-0.424*** (-3.71)	-0.374** (-2.68)
Education level d4	-0.815*** (-5.97)	-0.793*** (-4.57)	-0.858*** (-5.73)	-0.844*** (-4.45)
Married ⁵ : spouse present	0.159 (1.61)	0.11 (0.97)	0.0924 (0.86)	0.0326 (0.27)
Married: spouse absent	0.363 (1.63)	0.35 (1.4)	0.269 (1.14)	0.314 (1.2)
Sex ⁶	-0.213** (-2.62)	-0.219* (-2.35)	-0.227* (-2.54)	-0.245* (-2.41)
Age	0.00262 (0.13)	-0.0205 (-0.88)	0.00655 (0.3)	-0.0187 (-0.77)
Age Squared	-0.000206 (-0.90)	0.0000798 (0.3)	-0.000243 (-0.98)	0.000055 (0.2)
Household size		0.0865** (3.1)		0.0905** (3.01)
Metropolitan area		0.0377 (-0.43)		0.0986 (-1.06)
Constant	-0.187 (-0.41)	-0.538 (-0.74)	-0.358 (-0.73)	-0.816 (-1.07)
Observations	3210	2496	3210	2496
Pseudo R-squared	0.0203	0.0255	0.0201	0.0288

t statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

¹ Remit Dummy takes value 1 if in the last 12 months anyone in the household gave or sent money to relatives or friends living

² Family income is taken as the midpoint of the income brackets that the CPS defines. The regression uses log of family income.

³ Employment status is a dummy that takes value 1 for persons who are employed, and 0 otherwise (unemployed and outside the labor force).

⁴ Education level of the head of the household is represented by 4 dummies. The reference group is persons who have attended some years of schooling but have not obtained a high school diploma.

d1 is a dummy that takes value 1 for persons who have at most obtained a high school diploma and stopped their education.

d2 is a dummy that takes value 1 for persons who have attended college but have not obtained a college degree.

d3 is a dummy that takes value 1 for persons who have at most obtained a Bachelor's degree.

d4 is a dummy that takes value 1 for persons who have obtained a postgraduate degree (Master's, professional school degree, doctorate degree).

⁵ Marital status is represented by 2 dummies. The first takes value 1 if the head of the household is married and their spouse is present. The second takes value one if the head of the household is married and their spouse is absent. The reference group is the unmarried (widowed, divorced, separated, and never married).

⁶ Sex is a dummy that takes value 1 when the head of the household is a female, 0 otherwise (male).

Regressions (1) and (3) are unweighted, whereas regressions (2) and (4) are probability weighted by household weights of the CPS.

Table 4b. All Migrants

	(1) Remit Amount ¹	(2) Remit Amount	(3) Remit Amount	(4) Remit Amount
Family income		0.326*** (5.45)		0.264*** (4.06)
Employment status	0.0837 (0.51)	-0.0444 (-0.24)	0.075 (0.45)	-0.0102 (-0.06)
Education level d1	0.0711 (0.66)	0.109 (0.9)	0.0919 (0.8)	0.119 (0.92)
Education level d2	0.119 (0.82)	0.0416 (0.26)	0.154 (1.04)	0.104 (0.67)
Education level d3	0.369*** (3.42)	0.191 (1.49)	0.370** (3.24)	0.258 (1.96)
Education level d4	0.723*** (4.81)	0.367* (2.01)	0.633*** (3.33)	0.426 (1.92)
Married: spouse present	-0.0756 (-0.71)	-0.124 (-1.06)	-0.0178 (-0.16)	-0.0885 (-0.72)
Married: spouse absent	-0.0888 (-0.39)	-0.0285 (-0.11)	-0.0532 (-0.19)	-0.00632 (-0.02)
Sex	-0.214* (-2.47)	-0.207* (-2.15)	-0.271** (-2.84)	-0.257* (-2.45)
Age	-0.0266 (-1.27)	-0.0328 (-1.42)	-0.0258 (-1.18)	-0.0341 (-1.46)
Age Squared	0.000123 (0.52)	0.00018 (0.69)	0.000126 (0.51)	0.000228 (0.87)
Household size		0.0336 (1.18)		0.0613* (2.07)
Metropolitan area		0.118 (1.31)		0.0683 (0.71)
Constant	7.488*** (16.18)	4.217*** (5.62)	7.437*** (15.43)	4.707*** (5.51)
Observations	967	788	967	788
R-squared	0.0525	0.0864	0.0486	0.0772

t statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

¹ Remit Amount is the total dollars that was given or sent in the last 12 months by anyone in the household to relatives or friends living outside the U.S.

Regressions (1) and (3) are unweighted, whereas regressions (2) and (4) are probability weighted by household weights of the CPS.

Migrants from Haiti, the Caribbean, and Central America

In this section, we restrict the sample to migrants from CAC (including Mexico and Haiti) and repeat the two empirical exercises described above. The results are presented in tables 5a and 5b below¹⁴. The main differences in the findings are highlighted here:

- Contrary to the full sample of immigrants in Section VII.1 (not conditional on remitting), household income has a statistically significant impact on the likelihood to remit funds: higher household income increases the propensity to send funds. This is consistent with the intuitive premise that an income (or higher income) affects positively immigrants' likelihood to send funds, and to send a larger amount.
- Interestingly, education plays a lesser role, and is not statistically significant in this sub-sample of countries.
- Consistent with the full sample, men are more likely to send funds than women.
- When conditional on sending funds, there is a significant and positive relationship between household income and the amount sent in remittances, similar to the full sample results. The estimated elasticity for migrants from these countries is larger compared to the full sample at about 0.35-0.40, that is, a 1.0 percentage point increase in income results in an increase of about 0.35 percentage points in remittances sent.
- Lastly, we find that younger immigrants send relatively more funds.

To reconcile the findings in Section VI.1 and VI.2, the differences between the two sample groups are examined in more detail. As highlighted in Section IV, the level of education and income is lower on average among CAC immigrants than it was for the full sample. As discussed earlier, the heterogeneous level of educational attainment could capture indirectly the persistence of economic status (income levels) of family members living in the receiving country and their need for funds. In other words, the more educated is the immigrant in the U.S., the less in need of funds is his/her family "back home" since a higher level of education would imply, on average, a family with a relatively more favorable economic or social status. That said, in the sub-sample of CAC, the direct effect of income on remittances dominates: more income leads to more remitted funds.

While the full sample results regarding income and education are difficult to explain, the results for just CAC go in the same direction, statistically and intuitively, as the aggregate elasticities estimated in Sections V-VI, i.e., of remittance flows positively correlated with GDP growth and employment rates (negatively with unemployment rates).

Table 5a. Migrants from Haiti, the Caribbean, and Central America

	(1)	(2)	(3)	(4)
	Remit Dummy	Remit Dummy	Remit Dummy	Remit Dummy
Family income		0.234** (2.68)		0.231* (2.52)
Employment status	0.233 (1.1)	0.223 (0.92)	0.314 (1.38)	0.294 (1.13)
Education level d1	-0.252 (-1.93)	-0.302* (-2.02)	-0.223 (-1.62)	-0.328* (-2.08)
Education level d2	-0.324 (-1.68)	-0.378 (-1.69)	-0.283 (-1.35)	-0.352 (-1.43)
Education level d3	-0.316 (-1.78)	-0.377 (-1.80)	-0.223 (-1.18)	-0.331 (-1.48)
Education level d4	-0.893* (-2.01)	-0.871 (-1.74)	-1.085* (-2.14)	-1.047 (-1.85)
Married: spouse present	0.0783 (0.6)	0.00646 (0.04)	0.0153 (0.11)	-0.0782 (-0.49)
Married: spouse absent	0.335 (1.14)	0.322 (0.98)	0.215 (0.69)	0.186 (0.54)
Sex	-0.294* (-2.48)	-0.315* (-2.31)	-0.291* (-2.28)	-0.327* (-2.23)
Age	-0.0019 (-0.06)	-0.0282 (-0.81)	-0.0244 (-0.77)	-0.047 (-1.35)
Age Squared	-0.000115 (-0.32)	0.000203 (0.49)	0.000153 (0.41)	0.000422 (1.03)
Household size		0.0581 (1.5)		0.0872* (2.12)
Metropolitan area		0.196 (1.55)		0.279* (2.06)
Constant	-0.021 (-0.03)	-2.201* (-1.98)	0.341 (0.52)	-1.965 (-1.7)
Observations	1404	1107	1404	1107
Pseudo R-squared	0.0144	0.0221	0.0141	0.0279
t statistics in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				
Regressions (1) and (3) are unweighted, whereas regressions (2) and (4) are probability weighted by household				

Table 5b. Migrants from Haiti, the Caribbean, and Central America

	(1)	(2)	(3)	(4)
	Remit Amount 1/	Remit Amount	Remit Amount	Remit Amount
Family income		0.401***		0.367***
		-4.74		-4.14
Employment status	-0.0295	-0.102	-0.00219	-0.0468
	(-0.15)	(-0.45)	(-0.01)	(-0.20)
Education level d1	0.115	0.147	0.163	0.179
	(0.93)	(1.08)	(1.17)	(1.14)
Education level d2	-0.0597	-0.187	-0.108	-0.237
	(-0.32)	(-0.92)	(-0.63)	(-1.37)
Education level d3	0.209	-0.0423	0.147	-0.0961
	(1.24)	(-0.22)	(0.96)	(-0.56)
Education level d4	-0.85	-0.864	-0.972*	-0.959*
	(-1.89)	(-1.80)	(-2.35)	(-2.22)
Married: spouse present	-0.185	-0.231	-0.135	-0.216
	(-1.51)	(-1.70)	(-0.97)	(-1.39)
Married: spouse absent	0.0156	0.0742	0.0646	0.0861
	(0.06)	(0.26)	(0.18)	(0.23)
Sex	-0.166	-0.13	-0.2	-0.164
	(-1.49)	(-1.06)	(-1.55)	(-1.14)
Age	-0.0813**	-0.0831**	-0.0787**	-0.0873**
	(-2.98)	(-2.84)	(-3.03)	(-2.87)
Age Squared	0.000874**	0.000860*	0.000837**	0.000925**
	(2.68)	(2.47)	(2.80)	(2.62)
Household size	0.0382		0.0529	
	(1.10)		(1.45)	
Metropolitan area	0.125		0.0741	
	(1.09)		(0.64)	
Constant	8.579***	4.411***	8.500***	4.757***
	(14.87)	(4.35)	(14.58)	(4.35)
Observations	526	422	526	422
R-squared	0.0431	0.1005	0.0455	0.1054

t statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Regressions (1) and (3) are unweighted, whereas regressions (2) and (4) are probability weighted by household weights of the CPS.

Conclusions and Policy Considerations

This study assesses relationships between remittance flows and key macro indicators in source and receiving countries. It also looks at micro (household) data on immigrants in the U.S. to assess whether individual factors may influence the propensity to remit funds. While somewhat parallel tracks, the findings using these different data sets are broadly self-reinforcing—with a few exceptions.

The paper presents new estimates of elasticities of remittances with respect to growth and employment rates in both sending and receiving countries as well as elasticities with respect to differentials in growth and employment rates in both countries. Overall, remittance flows are estimated to be responsive to economic conditions in the sending country as well as receiving countries. The analysis finds that remittances rise more when U.S. economic growth is stronger and when the receiving country growth is weaker. The difference in the coefficients of the growth rates in the sending and receiving countries suggests that remittance flows are more responsive to sending country economic conditions than to those in the receiving country.

Labor market conditions are found to be particularly important determinants of remittance flows. The unemployment rate in the sending country relative to the rate in the receiving country is the more important factor. This differential is a rough proxy of the difference in income between the family split between the sending and the receiving countries, confirming the existence of a resource sharing model in which family members living in two different countries share resources. As labor market conditions in the receiving country deteriorate relative to the U.S., remitters would have a greater propensity to send funds. In addition, when combined with growth variables, labor market conditions provide stronger predictive power than when relying exclusively on income variables.

Section VI compares the impact of two global shocks on remittance patterns, finding that GDP differentials alone do not explain well the unexpected jump in remittance flows in 2020-2021. It is the unemployment differential with respect to the U.S. that better explains remittance patterns during the pandemic, supporting the findings in Section V regarding both the predictive power of labor market conditions as well as the role of the family resource sharing model in affecting the propensity to remit.

The study then explores micro-level data on immigrant households in the U.S. in an effort to identify individual characteristics that might affect the likelihood to send remittances (Section VII). In particular, and conditional on sending remittances, the higher the income of the household of all immigrants, the larger the amount sent. The estimated elasticity is larger for immigrants from CAC at about 0.35-0.40. While education and income are positively correlated for all immigrants, education plays a lesser role in determining remittance flows in immigrants from the CAC, possibly because immigrants from the CAC region have lower levels of education than the average of all immigrants. More tertiary education also has a positive effect on the amount remitted for the full sample—conditional on sending remittances—reinforcing the income channel described earlier. In general, these relationships, particularly from the CAC country sample, are broadly consistent with the findings on macro factors as laid out in Sections V-VI, namely that stronger GDP growth and lower unemployment would imply higher levels of income and education, which would be associated with stronger remittance flows.

The findings on the factors affecting remittances for the full sample of all immigrants in the U.S., not conditional on sending remittances, were counter intuitive and not consistent with the direction of aggregate macro relationships. For this broader sample, the higher the level of education of the “head of household”, the less

likely was the household to remit, and the household income variable was not statistically significant in the logit model. This could be explained by the same forces driving the “resource sharing” principle found in Sections V and VI, namely that immigrant households with higher levels of education in the sending country (U.S.) may already have more or most of their family members present in the host country, and/or their family members still living in the receiving country may already have a relatively higher level of education, reflecting that they come from families with relatively more favorable economic and social status. As such, they do not rely, or rely less, on transfers from the diaspora for income support or insurance against income shocks.

The findings in this study should strengthen the toolkit for forecasters and policy makers to anticipate remittance flows, drawing on estimated elasticities of remittances to key indicators, in both sending and receiving countries, and including importantly labor market conditions. The analysis of micro data provide results that could be of interest to U.S. policymakers in the formulation of domestic policies directed at education, the labor market, or at reducing inequality and gender gaps—topics well beyond the scope of this study. Indeed, the results of the analysis comparing remittances during the COVID pandemic and GFC shocks suggest that these domestic policies had an impact on immigrant income and employment.

References

- Abdih, Y., R. Chami, M. T. Gapen, and A. Mati. 2009. "Fiscal Sustainability in Remittance-Dependent Economies." IMF Working Paper 09/190, International Monetary Fund, Washington.
- Abdih, Y., A. Barajas, R. Chami, and C. Ebeke. 2012. "Remittances Channel and Fiscal Impact in the Middle East, North Africa, and Central Asia." IMF Working Paper 12/104, International Monetary Fund.
- Babii, A., Carare, A., Vasilyev, D. and Yakhshilikov, Y., 2022. Evolution of Remittances to CAPDR Countries and Mexico During the COVID-19 Pandemic. *IMF Working Papers, 2022 (092)*.
- Barajas A., R. Chami, C. Fullenkamp, M. Gapen, and P. Montiel. 2009 "Do Workers' Remittances Promote Economic Growth?." IMF Working Paper 09/153, International Monetary Fund.
- Barajas A., R. Chami, D. Hakura, and P. Montiel. 2012. "Worker's Remittances and the Equilibrium Real Exchange Rate: Theory and Evidence." IMF Working Paper 10/287, International Monetary Fund.
- Beaton, K., Cerovic, S., Galdamez, M., Hadzi-Vaskov, M., Loyola, F., Koczan, Z., Lissovolik, B., Martijn, J., Ustyugova, Y., and Wong, J., 2017, "Migration and Remittances in Latin America and the Caribbean: Engines of Growth and Macroeconomic Stabilizers?," IMF Working Paper 17/144, International Monetary Fund.
- Bettin, G., A. Presbitero, and N. Spatafora. 2015. "Remittances and Vulnerability in Developing Countries." *World Bank Economic Review*, 1-29, World Bank, Washington.
- Chami, R., Ernst, E., C. Fullenkamp, and Oekng, A., "Are Immigrant Are Remittances Good for Labor Markets in LICs, MICs and Fragile States? Evidence from Cross-Country Data", IMF Working Paper 18/102, International Monetary Fund.
- Docquier, F., Rapoport, H. and S. Salomone. 2012. "Remittances, Migrants' Education and Immigration Policy: Theory and Evidence from Bilateral Data," *Regional Science and Urban Economics*, 42: pp. 817–28.
- Flood, S., King, M., Rodgers, R., Ruggles, S., Warren, J., Westberry, M. 2021. "Integrated Public Use Microdata Series, Current Population Survey: Version 9.0 [dataset]. Minneapolis, MN: IPUMS. <https://doi.org/10.18128/D030.V9.0>
- Frankel, J. 2011. "Are Bilateral Remittances Countercyclical?" *Open Economies Review*, 22, 1–16.
- Hosny, A., 2020, "Remittance Concentration and Volatility: Evidence from 72 Developing Countries", IMF Working Paper 20/15, International Monetary Fund.
- ILO, COVID-19 and the Informal Economy, https://www.ilo.org/global/topics/employment-promotion/informal-economy/publications/WCMS_743546/lang--en/index.htm
- IMF (2009). "International Transactions in Remittances: Guide for Compilers and Users. Washington, D.C.: International Monetary Fund.
- IMF (2013), "Staff Guidance Note on the Application of the Joint Bank-Fund Debt Sustainability Framework for Low-Income Countries", IMF Board Paper, International Monetary Fund.
- Kpodar, K., Mlachila, M., Quayyum, S., Vigninou, G., 2021. "Defying the Odds: Remittances during the COVID-19 Pandemic", Working Paper 21/186, International Monetary Fund.

Lueth, E. and M. Ruiz-Arranz. 2008. "Determinants of Bilateral Remittance Flows," *The B.E. Journal of Macroeconomics*, 8 (1): pp. 1–21.

Le Golf, M. and S. Salomone. 2015. "Changes in Migration Patterns and Remittances: Do Females and Skilled Migrants Remit More?" CEPII Working Paper 2015-15 (Paris).

Poghosyan, T., 2020. "Remittances in Russia and Caucasus and Central Asia: The Gravity Model", IMF Working Paper 20/128, International Monetary Fund.

Appendix on Summary Statistics

Table 1. Summary Statistics for 2015-2019

Origin	% female	Average age	% college degree	Employment rate	Unemployment rate	Participation rate	US state where majority lives
USA	52%	47	30%	59%	4%	62%	NA
ATG	61%	43	31%	57%	7%	61%	New York
BHS	51%	42	33%	62%	7%	67%	Florida
BRB	50%	49	34%	59%	6%	62%	New York
CRI	52%	43	33%	59%	7%	63%	Florida
DMA	55%	42	28%	66%	5%	70%	Massachusetts
DOM	57%	44	18%	59%	7%	63%	New York
GRD	54%	45	23%	59%	6%	63%	New York
GTM	43%	39	10%	70%	4%	73%	California
HND	53%	38	10%	66%	5%	70%	Texas
HTI	54%	45	20%	64%	6%	68%	Florida
JAM	55%	45	27%	65%	6%	69%	Florida
LCA	52%	44	24%	65%	12%	75%	New York
MEX	48%	43	9%	64%	5%	67%	California
NIC	51%	45	22%	65%	5%	68%	Florida
PAN	58%	46	36%	63%	6%	67%	Florida
SLV	49%	42	8%	70%	4%	73%	California
TTO	56%	46	29%	63%	7%	67%	New York

Source: IMF staff calculations based on CPS data. Cells are green if statistics are better than national average, red if worse.

Table 2. Comparison between 2019 and 2020

Origin	Employment Rate		Unemployment Rate		Participation Rate	
	2019	2020	2019	2020	2019	2020
USA	60%	56%	4%	8%	62%	60%
ATG	49%	51%	4%	7%	52%	55%
BHS	69%	56%	5%	27%	72%	77%
BRB	47%	66%	9%	3%	51%	68%
CRI	62%	73%	3%	8%	64%	79%
DMA	70%	68%	6%	12%	74%	78%
DOM	59%	52%	5%	16%	62%	62%
GRD	44%	46%	7%	6%	47%	49%
GTM	69%	63%	3%	10%	71%	70%
HND	67%	62%	5%	11%	70%	69%
HTI	64%	57%	4%	12%	67%	65%
JAM	67%	62%	5%	11%	71%	70%
MEX	64%	59%	4%	9%	67%	65%
NIC	64%	55%	5%	7%	67%	59%
PAN	62%	56%	4%	10%	65%	62%
SLV	71%	64%	3%	11%	73%	72%
TTO	64%	59%	5%	8%	67%	65%

Source: IMF staff calculations based on CPS data. Cells are green if statistics in 2020 are better than in 2019, red if worse.



PUBLICATIONS

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