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Evolution of Remittances to CAPDR Countries and Mexico During the COVID-19 Pandemic

Aleksandra Babii, Alina Carare, Dmitry Vasilyev, and Yorbol Yakhshilikov

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Evolution of Remittances to CAPDR Countries and Mexico During the COVID-19 Pandemic

Prepared by Aleksandra Babii, Alina Carare, Dmitry Vasilyev, and Yorbol Yakhshilikov¹

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ABSTRACT: Traditional models relying on standard variables like the U.S. Hispanic unemployment rate fared well in explaining remittances to CAPDR and Mexico during the pre-pandemic period. However, they fail to predict the sustained growth in remittances since June 2020, including the significant increase in the average amount remitted. Using data from over 300 remittances corridors (from 23 U.S. states to 14 Salvadoran departments), we find that this increase is primarily explained by the dynamics of U.S. states real wages, as well as more temporary factors like U.S. unemployment relief (including the extraordinary pandemic support), U.S. states mobility, and COVID-19 infections at home. The paper also analyses what role the change in the modes of transmission of remittances, additional U.S. fiscal stimulus and U.S. labor market developments, especially in the sectors where CAPDR and Mexican migrants preponderantly work, play in explaining aggregate remittances growth.

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I. Introduction

Remittances represent a very important source of income for most Central American countries and Mexico. Many migrants from the CAPDR region (Central America, Panama and the Dominican Republic) work in the U.S. and send remittances home. For example, Mexico receives the most remittances (US\$ 34.6 billion in 2019) and Guatemala in CAPDR (US\$10.5 billion in 2019). However, scaled over the economy, El Salvador and Honduras remittances represented over 20 percent of GDP in 2019. Most importantly, one out of six families in the Dominican Republic, Honduras, and El Salvador rely on remittances as the primary source of income (Keller and Rousse, 2016). For many other families remittances insure against income disruptions caused by macroeconomic shocks (IMF, 2020, Beaton *et al.*, 2017).

At its onset, the COVID-19 pandemic raised concerns about its potential impact on remittances and the needed policy responses. In April 2020, the World Bank forecasted a 19 percent drop in remittances to Latin American and Caribbean region for 2020. Similarly, the Rapid Financing Instrument staff report for the Dominican Republic, from April 2020, forecasted a 14 percent decline in remittances for 2020. Those projections were based on the historical elasticity of remittances to changes in the U.S. Hispanic unemployment obtained from pre-pandemic samples. In turn, private consumption was also expected to plummet. Authorities and international financial institutions looked at ways to limit the impact of this shock (along with the other effects of the pandemic).

Although the pandemic shock turned out to be severe, and much worse than anticipated in April 2020, remittances to CAPDR and Mexico were resilient, raising a new set of questions. At the onset of the pandemic the contraction in remittances turned out to be much larger than feared, but it was short-lived. An equally unprecedented fast and strong rebound followed, such that by end-2020 remittances flows surpassed the pre-pandemic levels in many countries in the region. This trend continued in 2021 with the level and pace of growth in remittances much more elevated than pre-pandemic. This paper aims at answering two questions: what is the impact of the COVID-19 pandemic on remittances to CAPDR, and what have we learned about those flows that could guide us better in the future?

The existing literature explains partly the phenomenon in the region during the pandemic period. Recent empirical analysis based on worldwide data supports two narratives, the “altruism” motive—helping others—and a change in the mode of remittances transfers. For example, Kpodar *et al.* (2021) showed that the “altruism” motive—expressed by the number of COVID-19 cases in the recipient countries—was critical in driving counter-cyclical remittances. The fiscal support in host (advanced) countries is believed to have supported the income of migrants and, therefore remittances, but the literature found mixed evidence for this channel.¹ Lockdowns enforced changes in the mode of transactions—from informal to formal/digital (see also Dinarte *et al.*, 2021; Frizancho and Parrado, 2021).

This paper contributes to the growing literature on drivers of remittances more broadly, and during the COVID-19 pandemic in particular. First, the paper shows that traditional models estimated for 2000-2020 for five CAPDR countries and Mexico, while capturing well the pre-pandemic and the first half of 2020 in remittances dynamics, fail to predict the strong rebound since June 2020. The rebound was faster and stronger

¹ Kpodar et al. (2021) find that the fiscal support in host countries is positively associated with remittances but conclude that the effect comes through the favorable impact on economic activities in the host countries. Dinarte et al. (2021) did not find the evidence that the US fiscal stimulus package had a positive effect on registered remittances on municipal level in Mexico.

than the improvement in the U.S. Hispanic unemployment, a variable that explained well in the past the behavior of aggregate remittances to the region. Second, decomposing the remittances data to the region into volume of transactions and average amount remitted, we observe that the pre-pandemic upward trend in aggregate remittances in the region is explained entirely by the continuous increases in the volume of transactions (supported by continuous migration). However, during June-December 2020 the unprecedented strong increase in aggregate remittances is driven also by increases in the average amounts remitted. Third, using remittances data from over 300 corridors between 23 U.S. states to 14 El Salvador departments, we show that the pre-pandemic average amount of remittances is explained by U.S. real wages.

The study also shows unambiguously the effect of U.S. unemployment relief, and additional U.S. fiscal support in explaining the increase in the average amount of remittances in the second half of 2020. The average amount of remittances increased in the second half of 2020 primarily due to U.S. states unemployment relief, including for COVID-19. The average amount of remittances was higher coming from the U.S. states that had additional state relief that was extended to undocumented migrants and went to the Salvadoran departments that have experienced the highest increase in poverty, and COVID-19 infections, and declines in mobility. Remittance growth peaked in months where U.S. fiscal stimulus checks were received in 2020-21. In the second half of 2021, when the growth in U.S. real wages declined on average, the sustained increase in the average amount remitted is explained by a pick-up in infections cases. It also could be explained by additional U.S. fiscal support (tax child credits distributed during July-December 2021) and U.S. labor market developments, especially in the sector where migrants from CAPDR and Mexico preponderantly work.

Looking forward, remittances growth to the region is expected to moderate. Going forward, remittances will continue to have an upward trend over time, due to the expected increase in migration, and therefore in the volumes of transactions. Further increase in average amount remitted is possible, depending on U.S. labor markets developments (real wages and employment gains), primarily in the sectors where CAPDR and Mexican migrants preponderantly work. Over time, some growth in the average amount remitted may be coming from further reducing the cost of transferring remittances, due to financial innovations.

The paper is organized as follows. After a review of the existing literature in section II, section III presents stylized facts on the evolution of aggregate remittances to CAPDR countries. Section IV applies the traditional empirical model of the evolution of remittances to CAPDR countries, through two methods, while section V examines the evolution of aggregate remittances through the prism of volume and value effects. Section VI analyses the drivers of average value of remittances sent by an average Salvadoran migrant in the U.S. states to Salvadoran departments. Section VII discusses policy implications and concludes.

II. Literature Review

The empirical and theoretical literature consider multiple motives that explain remittances flows. These include the “altruism” motive, determined by migrants’ concern about family members’ living conditions in the home country; “exchange” motive, payment for services such as taking care of migrant’s assets or relatives; “insurance” motive, payment for a variety of informal coinsurance arrangements; and “investment” motive, in housing or capital, including education (human capital).²

² See Hagen-Zanker and Siegel (2007) for an extensive literature review, and 2016 Guatemala Selected Issues Paper for a concrete example.

In practice the interplay of different motives makes it difficult to empirically discriminate between them.

As such, most papers employ reduced-form estimations to understand drivers of remittances. Irrespective of the motive, or because one particular motive cannot be disentangled, the existing macroeconomic literature links remittances with different measures of economic conditions in the home and host countries that might affect the aggregate migration flows. As such, a rise (decline) in economic activity in the host (home) country is expected to increase remittances through an “altruism” channel (Azizi, 2019, World Bank, 2020), since living conditions in the host country are on average much better than in the home country. Similarly, a relative deterioration in the living conditions in the home country—measured by output level and other indicators, like inflation and/or exchange rate depreciation—also trigger an increase in remittances through the “altruism” channel (McGowan and Mahon, 2010). A perception of greater (lower) potential returns to assets in the home country relative to host country—measured, for example, by interest rate differentials—may increase (reduce) a flow of remittances through possible investment (IMF, 2005, Schiopu and Siegfried, 2006).

Those type of models led to broadly similar results for Latin America, and more specifically, CAPDR and Mexico. McGowan and Mahon (2010) conclude that macroeconomic variables are linked with aggregate remittances flows, but there is wide variation among countries. For example, while for remittances to Mexico both domestic and U.S. conditions seem to play a role, for the other countries in the region remittances are more elastic with respect to changes in the host country economic/income conditions rather than to the changes in the home country economic/income conditions (Beaton *et al.*, 2017, McGowan and Mahon, 2010). For El Salvador, domestic conditions were found to be insignificant. Orozco *et al.* (2016) find that an increase in remittances growth to Mexico is associated with an increase in the number of transactions, which are influenced by both the exchange rate and the Hispanic unemployment rate in the U.S. In Beaton *et al.* (2017) an increase in aggregate remittances to CAPDR countries is explained by natural disaster events, decline in Hispanic unemployment in the U.S., and changes in the home economic conditions.

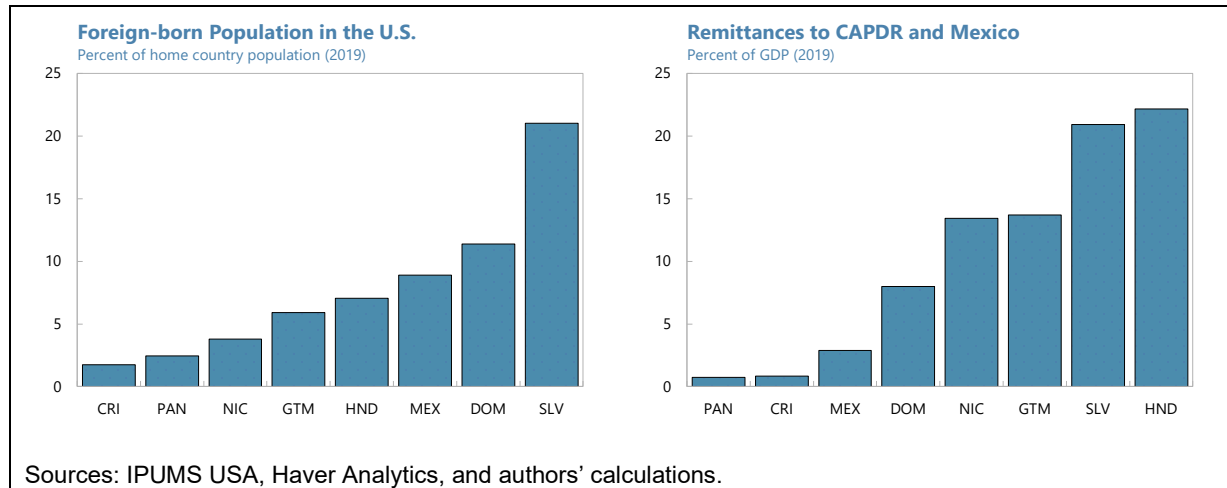
More recently, a few studies look at the evolution of remittances flows during the COVID-19 pandemic. Kpodar *et al.* (2021) provide evidence that remittances responded positively to COVID-19 infection rates in migrant home countries and negatively to stricter containment measures, pointing out to the altruistic or insurance motive. Their analysis, based on remittances flows for 52 countries (of which 4 CAPDR countries), between January and December 2020, also finds that the shift from informal to formal remittance channels due to travel restrictions could explain remittances’ resilience, as well as the fiscal stimulus in host countries. Dinarte *et al.* (2021) using Mexican data argue that a shift from informal to formal channel during the COVID-19 pandemic can partly explain an increase in the registered remittances. They do not find evidence showing that U.S. fiscal support (CARES) explains the increase in remittances, nor the altruistic motive.

III. Stylized Facts

A. Migration and Remittances

A large share of CAPDR and Mexico’s citizens live in the U.S., supporting incomes in the region through remittances. Specifically, 11 million people of Mexican origin live in the U.S., and about 1 million from each of the Northern Triangle countries (El Salvador, Guatemala and Honduras). Most importantly, scaled by the population of the country of origin, over a fifth of Salvadorans, and slightly over a tenth of people from the Dominican Republic live in the U.S. (left chart). Accordingly, the funds they send home are important,

especially for the Northern Triangle countries. For example, annual remittances have well surpassed a fifth of GDP in El Salvador and Honduras in 2019 (right chart).

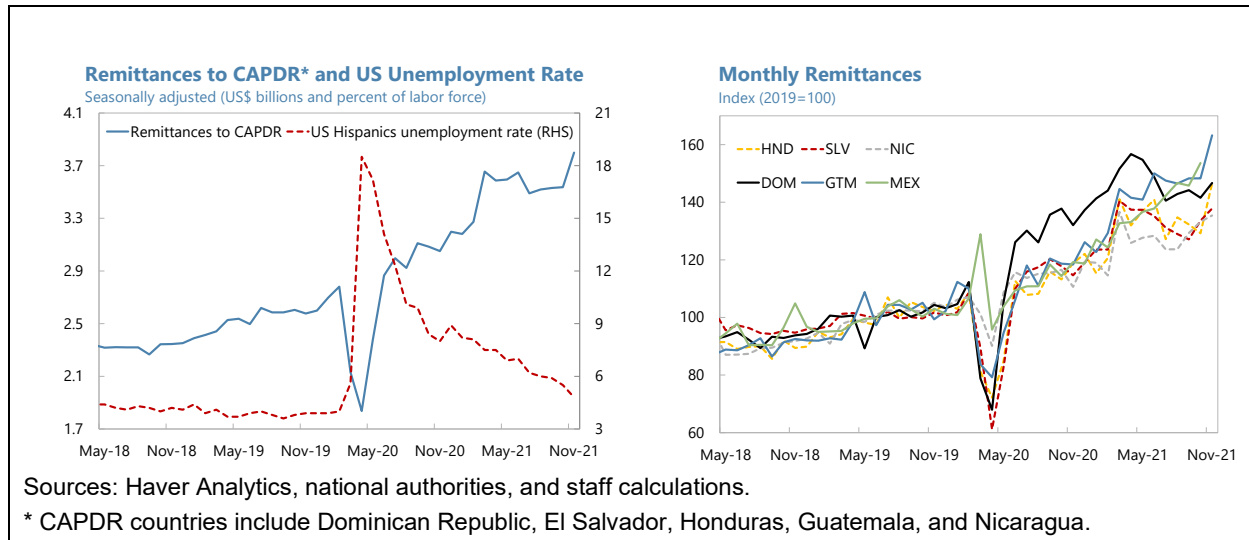


In this paper, we focus the analysis on developments from the largest recipients of remittances. In the Dominican Republic, El Salvador, Guatemala, Honduras, and Nicaragua, remittances over GDP represent close to or over 10 percent of GDP and are therefore representative of the developments in aggregate remittances for the whole region. Panama and Costa Rica have a much lower share of their population living in the U.S. (less than 2½ percent), thereby remittances represent less than one percent of GDP. Therefore, for the purpose of this analysis CAPDR refers to Dominican Republic, El Salvador, Guatemala, Honduras, and Nicaragua. We have also included Mexico in this study, as it has the largest number of migrants in the U.S., the biggest level of remittances (US\$ 36 billion in 2019), as well as rich data.

B. Evolution of Remittances

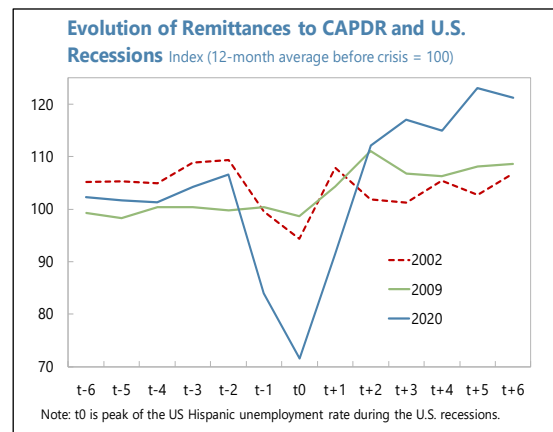
Remittances to CAPDR and Mexico come mostly from the U.S. and tend to be explained by U.S. labor market developments, especially pre-pandemic. A very large share of remittances to the region come from the U.S. (from 67 percent in Nicaragua to close to 95 percent in Mexico). Aggregate remittances to each country in the region have steadily increased over the years, while short-term developments tend to be highly correlated with U.S. labor market developments (left chart). Markedly, at the height of the U.S. lockdown, in April 2020, while the U.S. Hispanic unemployment rate increased to over 15 percentage points, remittances collapsed by more than a third.

This evolution of remittances during COVID-19 was similar in all CAPDR countries and Mexico. While there is variation across countries, the evolution of remittances during the COVID-19 pandemic is roughly similar (see charts). After the initial collapse, aggregate remittances rebounded strongly starting in May 2020, recording growth rates noticeably higher than pre-pandemic, especially by year-end. Furthermore, the pace of growth accelerated in the first months of 2021. Most importantly, as both charts show, the recovery in remittances was faster, and at a stronger pace than the recovery in the U.S. Hispanic unemployment could explain.



C. Comparing Evolution of Remittances in 2020 with Previous Recessions

The strong continued growth, above pre-pandemic level, is specific to this recession only. The behavior of remittances during the 2020 recession is unusual in a historical perspective. The text chart shows the peak in U.S. Hispanic unemployment at t₀, aligned for the 2002, 2009 and 2020 recessions. For comparability, aggregate remittances are indexed to 100, to show the 12-month average before each recession. The chart shows that prior to the pandemic the dynamic of aggregate remittances was similar to the other recessions. However, the recovery in 2020 shows a clear permanent upward trend. As the charts above show, extending the data for more months would have reached the same conclusion.

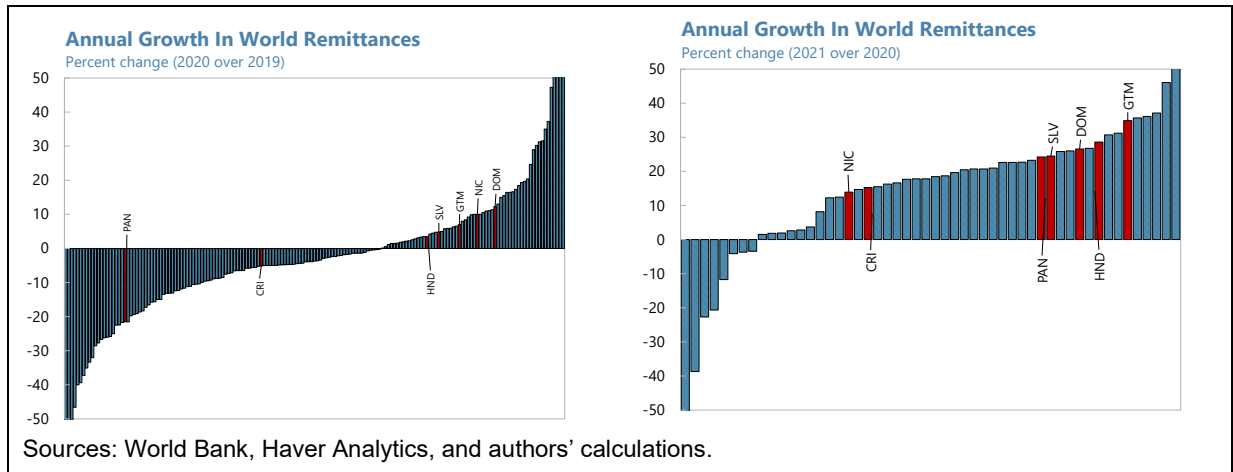


D. Comparing Evolution of Remittances in 2020 and 2021 with Other Regions

Aggregate remittances to CAPDR and Mexico were as resilient as in other regions in 2020 but seemed to have recorded the highest growth rates in the world in 2021. In 2020 in about half the countries in the world aggregate remittances declined compared to 2019, while in the other half of the countries in the world they increased.³ Remittances in CAPDR and Mexico have increased in 2020, but were below 15 percent, not particularly strong growth rates.⁴ In 2021, remittances increased strongly to most CAPDR countries and Mexico, being at the end of the distribution of growth rates (see chart). Notably, in Guatemala, remittances grew by 37 percent.

³ While for some countries the dynamics of remittances in 2020 depended on the exact timing of the pandemic onset and the size of the shock in source and home countries, it does not explain the dichotomy observed in the CAPDR region.

⁴ Except to Costa Rica and Panama, which we do not focus on in this study.



IV. Explaining Remittances Dynamics with a Traditional Model

To understand the dynamics of remittances to the region we employ a traditional macroeconomic empirical model that emphasizes the “altruistic” channel. This channel predicts that worsening living conditions in the recipient country caused by a disaster and/or economic shock triggers an increase in remittances. An improvement in the host country’s economic/income conditions, as shown above, would also lead to an increase in remittances. The higher earnings a migrant receives, or the higher probability to hold a job, the more remittances he/she would send.

We estimate the model using reduced-form regressions, as in the literature. We start by using fixed effects panel estimates to assess the in-sample prediction of the evolution of remittances since the COVID-19 outbreak, given the evolution of “macroeconomic” determinants of remittances. However, as this estimation method is likely to be subject to endogeneity issues, due to the effect of remittances on economic condition in the home country, we also present results from a panel VAR estimation approach that accounts for endogenous and cross-sectional dynamics.

A. Cross-Country Model of Remittances

We use both home and host country factors to explain the dynamics of remittances. The data sample covers a panel of five CAPDR countries, Mexico and the U.S. for the period between January 2000 and December 2020 at monthly frequency. Remittances flows are expressed in constant 2000 U.S. dollars. All series are expressed in year-over-year growth rates. All data are obtained from Haver Analytics. We included the following explaining factors:

- The economic conditions in the *United States* (the host country) are captured by U.S. Hispanic unemployment, and U.S. new housing permits. The latter captures the economic conditions in a particular sector of high employment for CAPDR and Mexican migrants. The altruism motive predicts that lower U.S. Hispanic unemployment and higher U.S. new housing permits should have a positive effect on remittances flows.

- The economic conditions in the *recipient countries* are captured by monthly index of economic activity (IMAE) in the manufacturing sector. This indicator is partially isolated from the effects coming directly from remittances flows, as the manufacturing sector in CAPDR depends mostly on external demand. The altruism channel predicts that remittances flows should increase with a declining IMAE.
- We also included other *control variables* often considered in the literature, such as interest rate differential, inflation differential, and REER. The differential of interest rate in CAPDR countries and Mexico relative to the U.S. captures a perception of greater potential returns to assets in the home country relative to host country and should positively affect the remittances flows due to the investment motive.⁵ The effect of the latter two controls might be more difficult to predict. If money in the recipient country tends to lose its value faster than those in the host country due to higher inflation or REER depreciation, the immigrant will want to save more dollars in the United States and will remit less. However, the migrant might want to remit more to support the family in the recipient country, especially if the migrant is sponsoring fixed costs monthly expenditures (health care premiums, educational fees, etc.).

The results from the panel fixed effect confirm the stylized facts. The table below shows that an improvement in economic conditions in the host country (as measured by a decrease in U.S. Hispanic unemployment rate) is significant and associated with an increase in remittances. Moreover, this is the highest coefficient explaining remittances dynamics.

Higher real depreciation of the recipient country currency (a decline in relative purchasing power) is also associated with remittances growth.⁶ The model also shows that an improvement in economic conditions in the recipient country (as measured by an improvement in IMAE manufacturing and lower inflation) is associated with an increase in remittances. However, the latter results are counterintuitive and most likely plagued by endogeneity (an improvement in IMAE manufacturing mostly likely is related to a global economic improvement, and thereby improvement in the U.S. Hispanic unemployment rate).

Text Table 1. Determinants of Remittance Flows (Fixed Effects Regression Model)

Dependent variable: y-o-y growth rate of aggregate remittances flows in constant 2000 US\$	
	(1)
U.S.: Hispanic unemployment rate	-0.737*** (0.000)
U.S.: Building permits	0.021 (0.171)
Recipient country: IMAE Manufacturing	0.291*** (0.000)
Interest rate differential	-0.192 (0.314)
Inflation differential	-0.428** (0.022)
REER	-0.175** (0.04)
Number of observations	878
All variables are in y-o-y growth rates. Standard errors reported in bracket. Maximum period is from 2000M1 to 2020M12. *p<0.10, **p<0.05, ***p<0.001	

The results are robust to different approaches and specifications. In Annex I we show a different specification, using IMAE agricultural production, since the production of the sector is likely to be driven more by weather conditions than demand in the U.S. Therefore, to a large extent the endogeneity problem is

⁵ The interest differential reflects other country specific factors, for example risk premium.

⁶ The OLS estimation might still be affected by endogeneity even when remittances are expressed in U.S. dollars, and not the regressors. In particular, in remittances-dependent countries, remittances might affect REER through their effects on BOP flows, national income and prices, that might result in an ambiguity of the effect of remittances on REER. However, the jury is still out on endogeneity, as empirical studies find mixed results for the effects of remittances on REER (see Barajas et al., 2010).

reduced. The results are similar, albeit aggregate remittances are much more elastic to the U.S. Hispanic unemployment rate. Additional robustness exercises include using a different method (see next subsection).

B. Panel Vector Autoregression Model of Remittances

As a second step, we used the panel vector autoregression method developed by Abrigo and Love (2016) to further control for endogeneity. This method applies the generalized method of moments estimator and allows all variables to be treated as endogenous as well as cross-sectional dynamics. While this model does not impose long-run restrictions and does not identify structural shocks, it helps computing orthogonalized impulse response functions using Cholesky decomposition.

$$Y_{it} = Y_{it-1}A_1 + Y_{it-2}A_2 + \dots + Y_{it-1}A_{p-1} + Y_{it-p}A_p + u_i + e_{it} \quad (1)$$

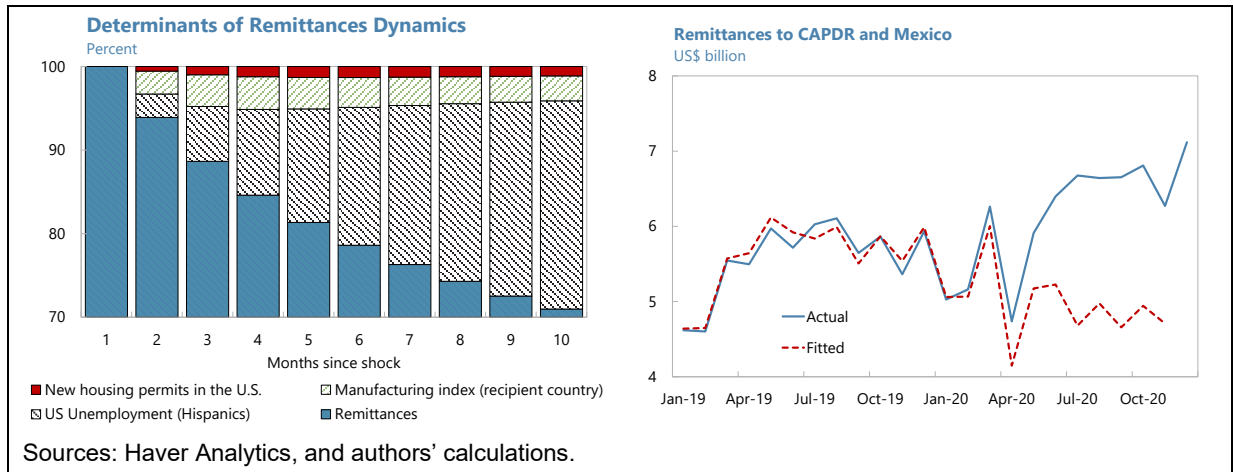
where Y_{it} is a vector of endogenous variables—at year-over-year growth rates—for county i at month t (including: aggregate remittance flows in constant 2000 US\$ from the U.S. to each CAPDR country and Mexico; manufacturing index of the home country;⁷ U.S. Hispanic unemployment rate; new housing permits in the U.S., u_i represent country i 's fixed effects, and e_{it} idiosyncratic shock. The lag order p is set at 1, based on the model selection criteria by Andrews and Lu (2001).⁸

Economic activity in the U.S. and home economies explains well the dynamics of remittances, historically and during the initial phase of the pandemic. The left chart shows that over twenty-one years of monthly data, for five countries (Dominican Republic, El Salvador, Guatemala, Honduras and Mexico), the U.S. Hispanic unemployment explains most of the variation in remittances data (7 percent after 3 months, and 95 percent after ten months). Manufacturing activity in the home/recipient country is the second explanatory variable, explaining 4 percent of variation in remittances. New housing permits in the U.S. also could explain remittances, but to a much lower extent, since it presents developments only in one sector where CAPDR and Mexican migrants might work. Historically, lower U.S. Hispanic unemployment and declining manufacturing production in the recipient countries increase remittances. The reverse was observed and relatively well captured in March-April 2020 (right chart). The incipient part of the recovery, May 2020, is also captured relatively well by the model, and explained primarily by the rapidly declining U.S. Hispanic unemployment and recovery of manufacturing activity in home countries.

However, the traditional variables fail to capture the magnitude of the recovery in remittances in the second half of 2020. The improvement in the U.S. Hispanic unemployment rate and changes in the manufacturing production in CAPDR and Mexico were significant. However, they explain only half of the aggregate remittances recovery that we saw in the Central American countries in the second half of 2020. The model has similar results for all countries, and estimating the model until 2019, or until the end of the first half of 2020 produces the same in-sample poor prediction for the second half of 2020.

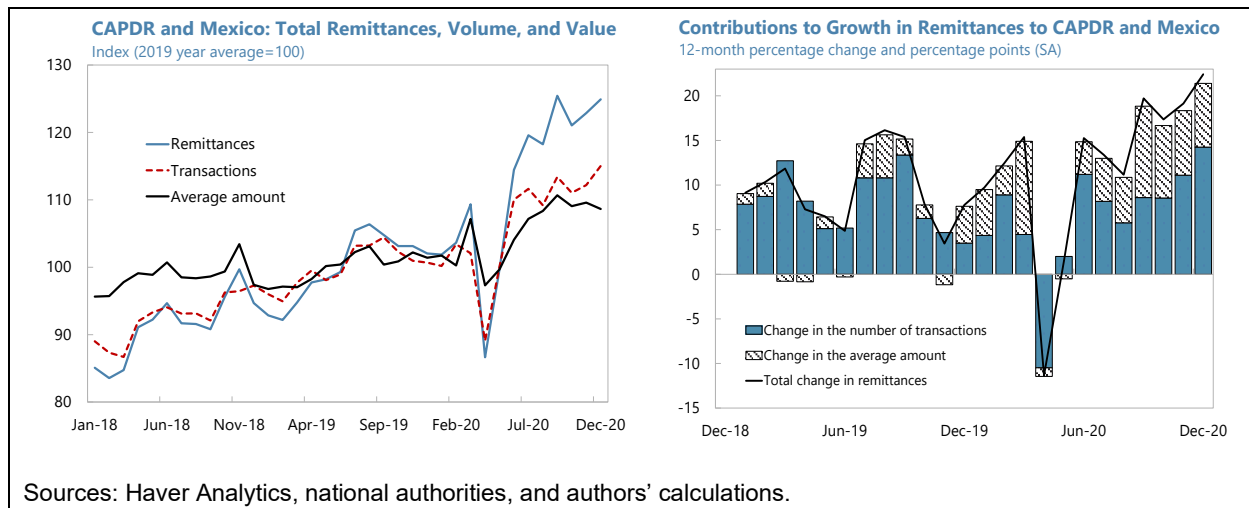
⁷ In another specification we also used agricultural production.

⁸ Aggregate remittances growth rate are $I(0)$ variables, and so are the other variables, even the ones not used in growth rates. Hence, we did not use a cointegration model.



V. Explaining Remittances Dynamics by Decomposing Aggregate Remittances

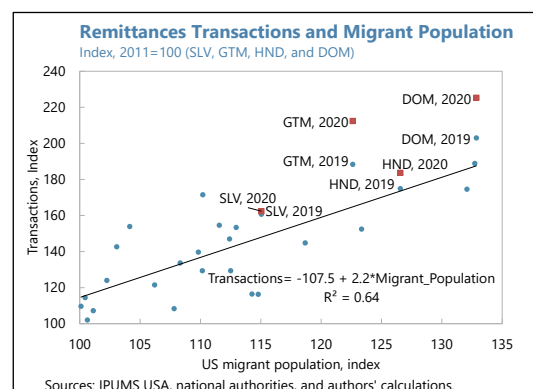
To explain remittances flows since mid-2020, we decompose them into number of transactions and average value remitted, with data provided by CAPDR central banks. The left chart below shows this decomposition for CAPDR and Mexico, 2018-2020, at monthly frequency. The right chart shows the annual percentage change in 2020 remittances compared to the same month of 2019, for CAPDR and Mexico, and the decomposition into the contribution from the number of transactions and the average amount remitted.



Remittance flows used to be explained primarily by the number of transactions, but since the summer of 2020 are explained mostly by the average amount remitted. We observe that the increase in remittances to CAPDR and Mexico pre-pandemic is explained primarily by the number of transactions, while the average amount remitted remains relatively flat, especially in 2018 and the first half of 2019. The precipitous drop in remittances at the onset of the pandemic in the spring 2020 was also explained primarily by a drop in the number of transactions. However, as the right chart shows, the rebound in remittances since July 2020 was

primarily due to the increase in the average amount remitted. The results shown here include Mexico and countries where the number of transactions was predominant. However, looking only at CAPDR countries, by December 2020, the peak of remittances growth in this period to CAPDR was 28 percent, of which 14 percentage points was due to an increase in the average value of remittances.⁹ To put things into perspective, prior to the pandemic the increase in the average amounts remitted was non-existent until the second half of 2019, when it only increased at most by 5 percent (representing less than half of the increase in aggregate remittances).

The increase in the volume of transactions for CAPDR countries is explained by the increase in the stock of migrants over time, but not in 2020. Historically, the volume of transactions has a high correlation with the number of migrants. See text chart showing the upward trending slope—estimated with pre-pandemic data—between the number of transactions and the stock of CAPDR migrant population in the U.S. Moreover, a simple regression of the number of transactions on the stock of migrants living in the U.S. has a high explanatory power, and the coefficient is statistically significant at the 1 percent level. In 2020, pandemic-induced travel restrictions for at least half of the year (March-September), considerably reduced the inflow of migrants from most CAPDR countries. As mentioned earlier, and consistent with Orozco 2022, the number of transactions increased to Mexico, but migration from Mexico to the U.S. increased as well.



The increase in the number of transactions in 2020 to CAPDR countries seems to be explained by a larger share of individuals already living in the U.S. remitting, not by new migrants. It is most likely that given the limited migration and mobility in the U.S. and at home for a large part of 2020, and of high cost of transferring remittances,¹⁰ a larger share of migrants already living in the U.S. remitted, than new migrants arriving and remitting, or same migrants remitting more often. While there is not enough information to test this hypothesis, there is enough information supporting this explanation in two possible ways. First, people that may not have remitted before may have started remitting, or individuals that have stopped remitting re-kindled their support during the pandemic, due to the “altruism” motive.¹¹ Second, people that have been remitting in person cash-remittances while visiting relatives started to transfer remittances in a digital manner, which could be tracked (see Box 1). Moreover, as migrants that otherwise would have spent their funds on travel and gifts to family before, and not remitting, when they sent funds digitally in 2020, would have sent a high amount not just the amount allocated for gifts or in-cash remittances.¹²

⁹ While there is considerable seasonality recorded in all countries in the months of March and December, as the chart shows, the contribution of the average amount remitted to the increase in aggregate remittances compared to 2019 is considerably higher than pre-pandemic, in all countries since June 2020, not only in December 2020.

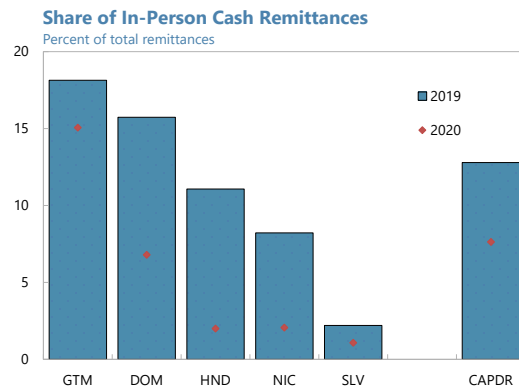
¹⁰ About five percent, see Bersch and others, 2021.

¹¹ Beaton and others (2017) show that ties weaken over time as family members die in the home country.

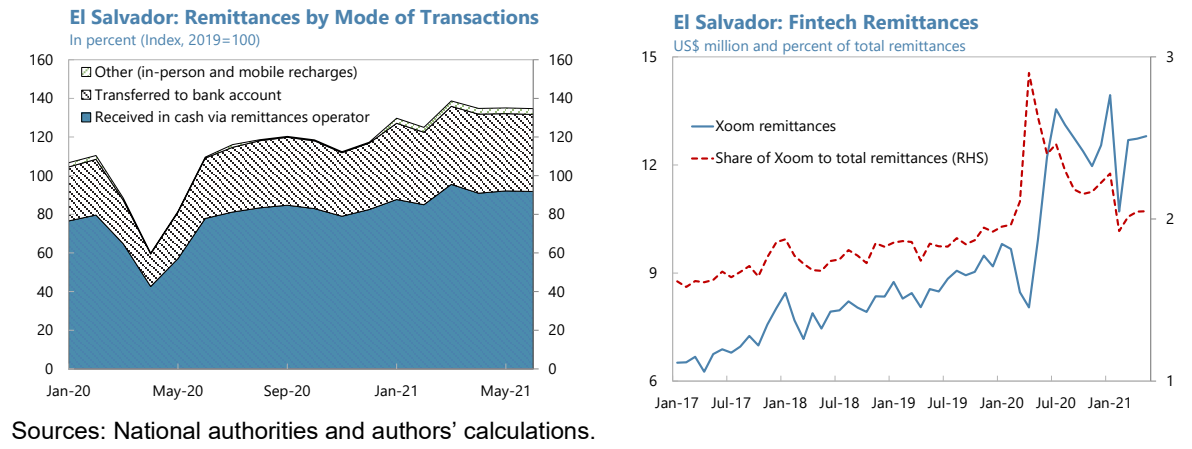
¹² Data shows that travel to the region indeed collapsed in 2020.

Box 1. Factors Affecting Change in the Volume of Remittances Transactions during COVID

Travel restrictions and lockdowns altered the modes of transfers of remittances in the region. The share of registered in-person cash remittance transfers has declined by about 5 percent for the region (see text chart), and this was picked up by transfers through financial institutions (and more as the aggregate data shows). There was considerable variation among countries. The largest observed switches were recorded in the Dominican Republic, and Honduras, about 10 percent, compared to about 3 percent in Guatemala and negligible in El Salvador.



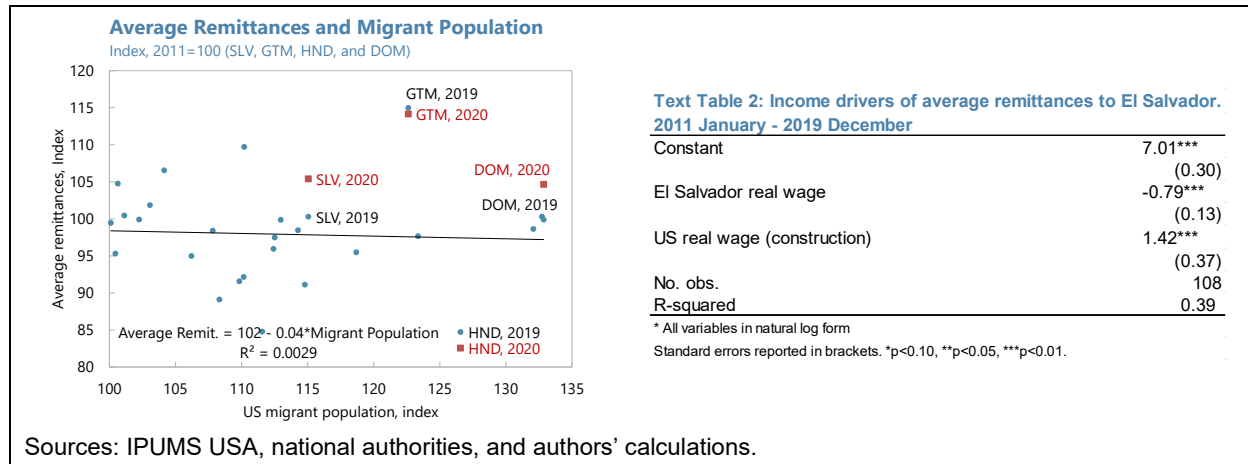
Zooming in, we can observe the virtual mode of transfer remittances. Data from El Salvador shows that, since May 2020, electronic transfers rebounded, with growth in the bank transfer mode remittances more than double the growth in other modes of remittances. Similarly, Fintech remittances accelerated rapidly during the pandemic (see charts). However, as both bank transfers and Fintech remittances make up less than 1/3 of total remittances, the overall contribution to change in total remittances from these shifts was marginal, as we have noted above. (Continued)



Sources: National authorities and authors' calculations.

The increase in the average value of remittances can be explained partially by U.S. wages. The earlier text charts show that pre-pandemic the average amount remitted stayed relatively constant. The left chart below shows that there is no correlation between the increase in the stock of migrants and the average amount remitted. On the other hand, Table 2 shows that even though average remittances are positively and strongly correlated with migrants' U.S. real wage (a coefficient of 1.42 percent) and negatively correlated with the average real wage in El Salvador.¹³ However, income factors alone explain only 39 percent of the change in the average remittances over two decades (2011-19), leaving open the question what explains the increase in the average amounts remitted, especially in 2020.

¹³ Average real wage for the economy, used both for the U.S. and El Salvador.



VI. Explaining the Increase in Average Amount of Remittances to El Salvador

To understand what explains the increase in average amount remitted in 2020 real wages, we use **granular data for El Salvador**. In particular, we focus on remittances data from U.S. states to Salvadoran departments. We analyze only El Salvador data at this level of detail, as it is available at this granular level, but results are informative for the other countries in the region.

A. Model and Data

We extended the conceptual model of “altruism” to the average Salvadoran migrant in the U.S. states.

We used monthly data on average amount of remittances for 314 corridors: from 23 U.S. states to 14 El Salvador departments, from January 2017 to December 2020. For each corridor the average amount remitted is calculated as the total remittances from an U.S. state sent to a Salvadoran department, divided by the number of transactions in the corresponding corridor.¹⁴ The “altruism” model predicts that higher amounts on average are remitted due to higher income in the host country, and lower income (or more hardship) in home/recipient countries (Funkhouser, 1995). To account for income, we control first for real wage per U.S. state.¹⁵ To control for the hardships facing the families at home, we included monthly new COVID-19 infection cases per Salvadoran department.

The model controls for other factors affecting income in U.S. states, in particular economic policy and labor market conditions. The unemployment relief includes the average regular unemployment insurance, as well as COVID-19 specific relief, and may explain an increase in the average amount remitted if a job is not held, especially if the relief benefits are higher than their previous earnings (see Annex II and III explaining the U.S. fiscal support provided through the CARES ACTs I and II at the federal level and additional benefits

¹⁴ While not all migrants may remit, the approximation is a good representation of the average amount remitted, because it is in line with the national average, about US\$195 per sender (Keller and Rousse, 2016).

¹⁵ There is no data on average/median wages in Salvadoran departments.

provided at states level¹⁶). Mobility per state is a proxy for hardship or lack of access to “brick and mortar” cash transfer remittances (under a lockdown for example). Unemployment relief benefit per unemployed person measures the impact of the U.S. fiscal policy to alleviate COVID-19 effect, in addition to the regular unemployment benefits. To capture the effect of the Salvadoran fiscal support—especially the US\$300 cash transfer per household distributed at the beginning of the pandemic—we included a measure of public sector transfers to Salvadoran households. In addition to the variables explained above, we included dummies per U.S. state, to account for state-specific factors not captured by the main explanatory variables.

Therefore, the model specification explaining the average amount of remittances from an U.S. state, S, to a Salvadoran department, D, is:

$$\ln(Rem)_{S,D,t} = \beta_1 \ln(W)_{S,t} + \beta_2 \ln(UI)_{S,t} + \beta_3 \ln(M)_{S,t} + \beta_4 \ln(COVID)_{D,t} + \beta_5 \ln(Transfers)_{D,t} + u_S + v_D + \varepsilon_{S,D,t} \quad (2)$$

- $\ln(Rem)_{S,D,t}$ is the natural logarithm of average amount of remittance sent from U.S. state S to Salvadoran department D at month t (adjusted for El Salvador inflation);
- $\ln(W)_{S,t}$ is the natural logarithm of average weekly real wage paid in residential construction and landscape sectors in U.S. state S month t;
- $\ln(UI)_{S,t}$ is the natural logarithm of total unemployment relief benefit (including regular and pandemic) divided by the stock of unemployed population in U.S. state S month t;
- $\ln(M)_{S,t}$ is the natural logarithm of motor vehicles traveled miles in U.S. state S month t;¹⁷
- $\ln(COVID)_{D,t}$ is the natural logarithm of new COVID-19 cases per 1 million population in Salvadoran department D at month t;
- $\ln(Transfers)_{D,t}$ is the natural logarithm of public transfers to private sector adjusted for El Salvador inflation divided by number of households in month t;
- u_S is U.S. state specific effect;
- v_D is Salvadoran Department specific effect; and
- $\varepsilon_{S,D,t}$ is an error term.

All series are seasonally adjusted.

The data sources are either from official U.S. or El Salvador sources, as follows. As mentioned above,

¹⁶ We describe state-specific benefits in the states in which CAPDR and Mexican population preponderantly live, and have extended significant benefits (California, New York and District of Columbia).

¹⁷ The Google Community Mobility data restricted time sample coverage, starting in February 2020. While the U.S. highway mobility indicator has long time series coverage, and we were able to capture dynamics in mobility prior to the pandemic. Moreover, for the common time span (February 2020 to December 2020), the correlation between the two mobility indicators is almost one-to-one.

data from average amount remitted per corridor (U.S. state per Salvadoran department) collected by the central bank of El Salvador from the main operators. We used data from the U.S. Bureau of Labor Statistics per U.S. state on hourly real wages in the sectors specified above, unemployment relief benefits in U.S. dollars (total divided by the number of unemployed) and unemployment rates. Data on U.S. state mobility is from the U.S. federal highway administration. Data on COVID-19 new cases in El Salvador departments is from the El Salvador Ministry of Health. Data on transfers is from Ministry of Finance of El Salvador.

B. Estimation and Results

The empirical strategy controls for several estimation issues. First, to account for the presence of serial autocorrelation, as shocks to the average value of remittances tend to linger, we estimate the model using the Feasible Generalized Least Squares method. Second, some independent variables are correlated, especially during the pandemic months. To address multicollinearity concerns, we estimated the model with a fewer set of variables—and our results are robust to variable selection.¹⁸

The specification explains relatively well the data. Results are presented in Table 3 and charts below. The coefficient of U.S. state real wage has the largest magnitude, suggesting that the average value of remittance is highly sensitive to changes in migrants' labor income, in line with existing literature. The unemployment relief and U.S. state mobility are also important in explaining the dynamics of remittances during 2017-2020 and statistically significant (different from zero), as well as the number of new COVID-19 cases in Salvadoran departments and public transfers to Salvadoran households. The results imply that an increase in the average amount remitted is highly driven by well people are doing in the U.S. (as mostly explained by the real wage).

Text Table 3: Determinants of Evolution of Average Value of Remittances (2017:1—2020:12)

Constant	0.741*** (0.232)
US: Real wage	0.673*** (0.039)
US: Unemployment insurance per unemployed	0.012*** (0.001)
US: State mobility	0.158*** (0.012)
SLV: New COVID cases	0.037*** (0.003)
SLV: Government transfers per household	-0.014*** (0.003)
Number of observations	15072

* p<0.10, ** p<0.05, *** p<0.01

Sources: National authorities and authors' calculations.

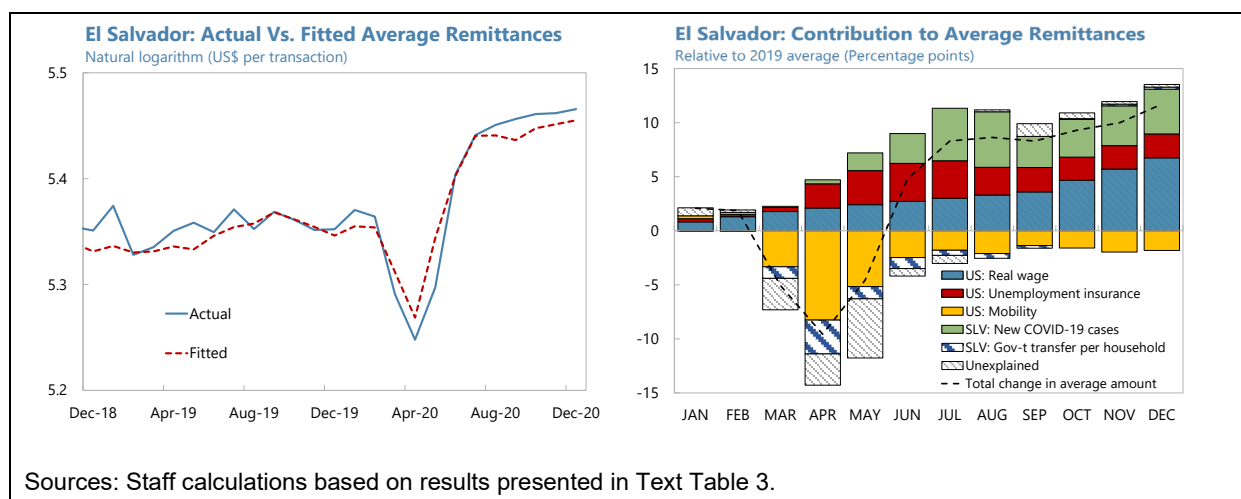
The model has a good fit, especially after June 2020. The left chart below shows the fitted versus the actual value of average remittance level, while the right chart shows the contribution to the average amount remitted increase in 2020 compared to 2019. The unexplained component in the right chart is considerably declining since May 2020, reaching almost zero in three of the seven subsequent months. We see that both home country factors and U.S. factors related to the pandemic can explain the increase in average value of remittances in 2020 since June.¹⁹

¹⁸ For correlation coefficients among variables see Annex V. The results remain robust to the exclusion of unemployment relief, or other measures of unemployment relief, Salvadoran fiscal support, and the inclusion of additional variables, like the U.S. stimulus checks.

¹⁹ See Annex VI, Table 4 for various estimations. Notably the signs on the coefficients for U.S. real wage and unemployment relief did not change under alternative specifications/sample periods, but their magnitude changed. We interpret this as a temporary regime change in the elasticity of remittances with respect to changes in the structural variables (real wage) because of the pandemic, rather than a structural break.

We can observe that the increase in average amounts remitted in 2020 is primarily explained by developments in the U.S. real wage, especially in the last quarter of 2020 (blue bars). Moreover, this contribution increases over the year. The U.S. COVID-19 unemployment, extended at the state level either as the regular unemployment insurance, or the federal COVID-19 unemployment relief (the red bars) explain another part of the increase in the average remitted, as they compensated for the loss of a job. As real wages recovered (in line with the rapid recovery of the U.S. Hispanic unemployment shown on page 9), we observe that unemployment relief still played a significant, but smaller role in explaining the increase in the average amount remitted. Most importantly, what the chart also shows is that the “altruism” motive is very strong. As long as the infections are increasing at home, Salvadorans in the U.S. will send on average more money home. This variable tends to have a relatively constant contribution, albeit being higher during the first peak of infections in El Salvador (July-August 2020).

Several factors would have negatively affected the average amounts remitted in 2020. The restricted mobility in U.S. states (yellow bars) reflects limited job opportunities to earn an income, or to send cash, predicting a lower average amount remitted. The transfer system in El Salvador, particularly the one-off cash transfer distributed in April-May 2020, could explain the need of lower average amounts remitted.²⁰

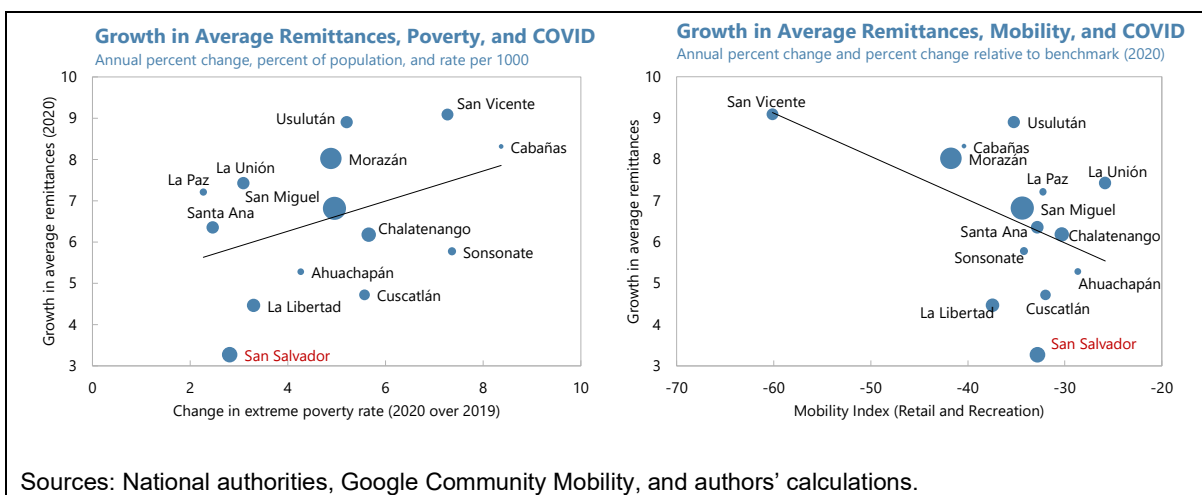


The results are robust, and the unexplained component in May-June 2020 not captured by the model remains the smallest in the specifications presented. The results are robust to various variables used (e.g. average real wage per U.S. state). Results are available by request from the authors. It is important to note that incorporating the April 2020 stimulus check for eligible U.S. families (from the CARES Act, which was sizeable), does not alter the results, since it was not significant. Another important point to make is that the unexplained component for April 2020 is larger in other specifications (that include unemployment rate, and other real wage and unemployment relief measures, and do not include the transfers in El Salvador). Therefore, to understand better the role of various factors, we focus next on presenting the home and host factors not included into the regression model that could also support the narrative.

²⁰ To ensure that the population and businesses comply with the strict lockdown, the government provided (i) an unconditional cash transfer of US\$300 per household (the equivalent of the monthly average wage), to 75 percent of households, (ii) two rounds of in-kind food baskets to about 1 million households, that were distributed in March-June 2020.

C. Understanding the “Altruism” Motive: Home Factors

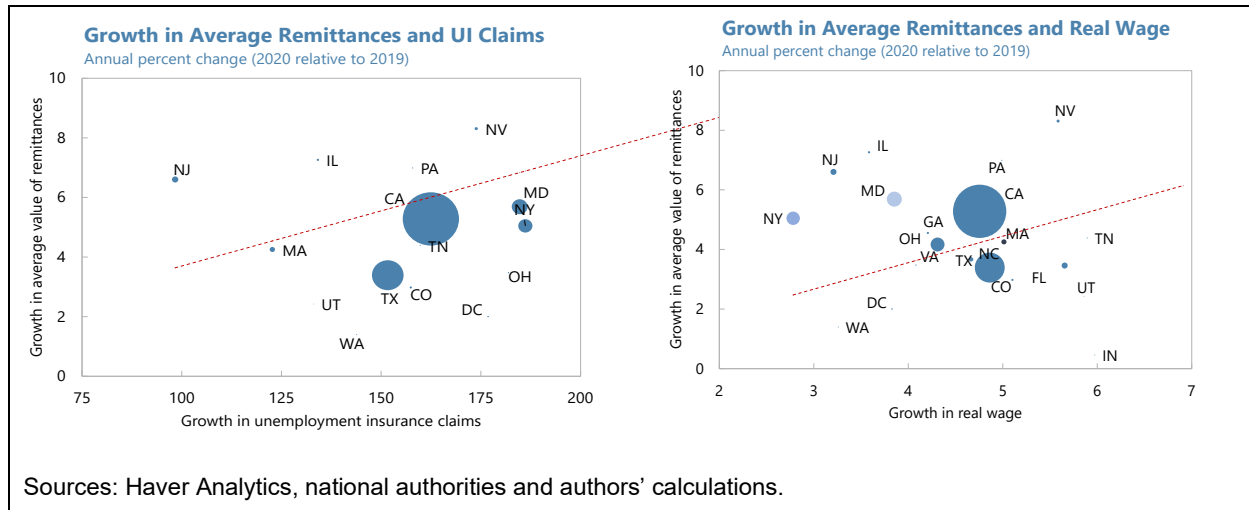
Growth in average amount of remittances was the highest in the poorest and most mobility-restrained Salvadoran departments, also with high number of COVID-19 cases. To better understand the altruism motive, we compare growth in average amount of remittances per Salvadoran department, with change in poverty and mobility levels. Moreover, we also juxtapose the level of COVID-19 infections. Therefore, the left chart shows the change in average remittances in 2020 over 2019 on the vertical axis, compared to the change in extreme poverty from 2019 to 2020, on the horizontal axis. The chart shows a clear positive trend. The size of the bubbles per department shows the end-2020 COVID-19 cases per thousand people. Department San Vicente has observed the highest increase in extreme poverty of about 8 percentage points, (left chart), had the lowest mobility (right)²¹ and received one of the highest increases in average value of remittances (9 percent). Similarly, other poor departments, like Morazán and Usulután, also received higher increases in the average value of remittances, as explained by increased in poverty, mobility and level of infections (especially for the former). The results are robust when dropping San Vincente from the sample.



D. Understanding the “Altruism” Motive: Host Factors

High growth in the average value of remittances was observed coming from the U.S. states with robust growth in real wages and unemployment insurance claims. The charts below show the growth in the average remittances against the growth in real wages in the left chart, and growth in unemployment insurance relief in the right chart. The size of the bubble represents the share of Salvadoran-born population in that state relative to the Salvadoran-born population in the entire U.S. All the dots above the red dotted line, which shows the slopes of the respective estimates reported in Table 3, represent states in which we observe a higher increase in the average value of remittances than predicted by the model. Therefore, the charts show that the increase in the actual average value of remittances in 2020, was higher than predicted by growth in real wages, and even unemployment insurance claims. Notably, states with the largest migrant population from CAPDR, like California, have seen higher increases in the average value of remittances as predicted by our model.

²¹ The right chart shows the change in average remittances in 2020 over 2019 on the vertical axis, and the change in mobility index compared to the benchmark on the horizontal axis, with a clear negative trend.

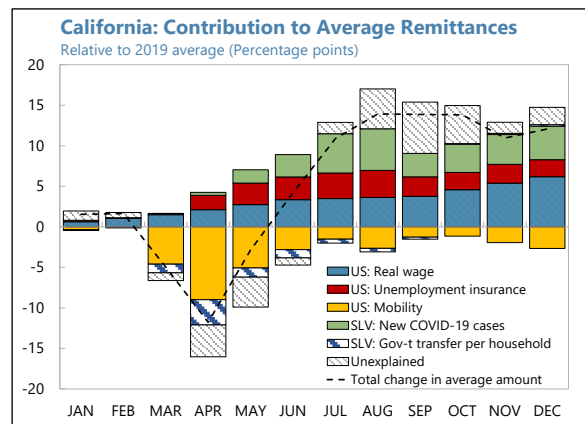


The unexplained part in the growth of average remittances across states could be attributed to

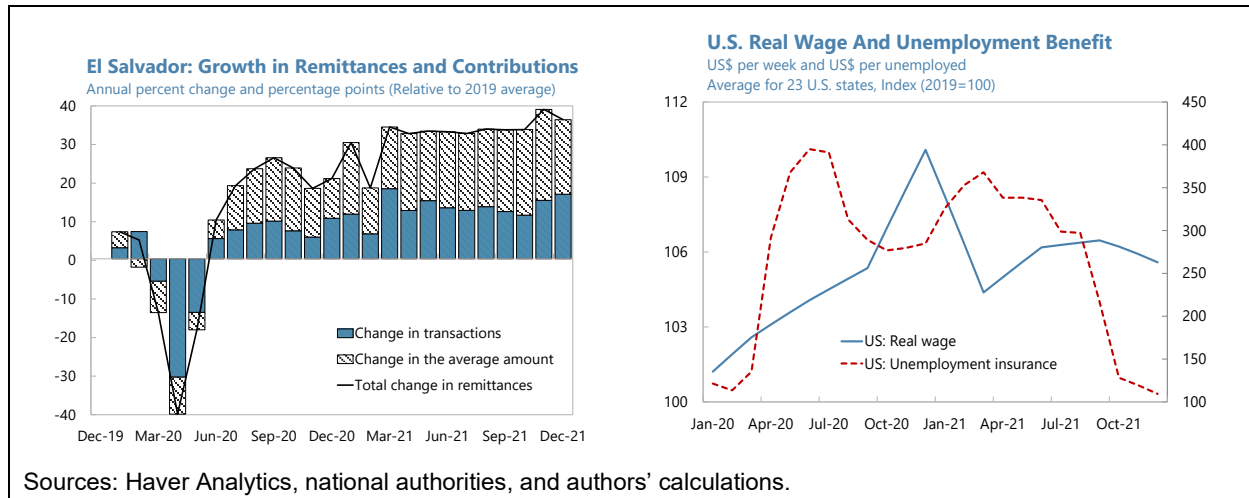
additional factors, such as additional state-specific relief programs. The charts show how the model is not able to predict the increase in the average value of remittances in the second half of 2020, in California, as compared to the national average. In this state, the additional relief was extended to workers regardless of their legal status, enlarging the pool of migrants receiving COVID-19 unemployment relief (see Annex III).

In 2021 remittances continued to grow due to a confluence of many factors, preponderantly of temporary nature though. Remittances growth to El

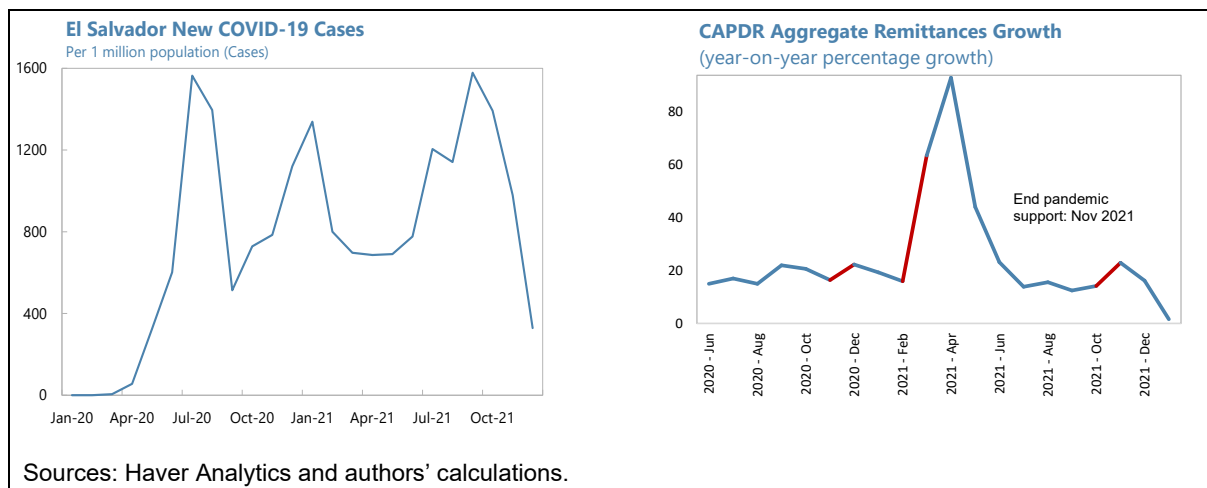
Salvador, increased 32 percent in 2021 relative to 2019, with more than half of the increment attributed to an increase in the average amount of remittances (chart). This extraordinary growth in average amount remitted is due to a confluence many factors, although the majority were of a temporary nature:



- *U.S. real wage growth* continued to increase, although at a more moderate pace. Moreover, by the end of the year it started to decline (see chart);
- *Unemployment relief support* continued, but by the year-end it reached almost zero, as the exceptional support expired (see chart) and the regular unemployment benefits were not high, as the U.S. Hispanic unemployment continued to decline (see chart page 9);



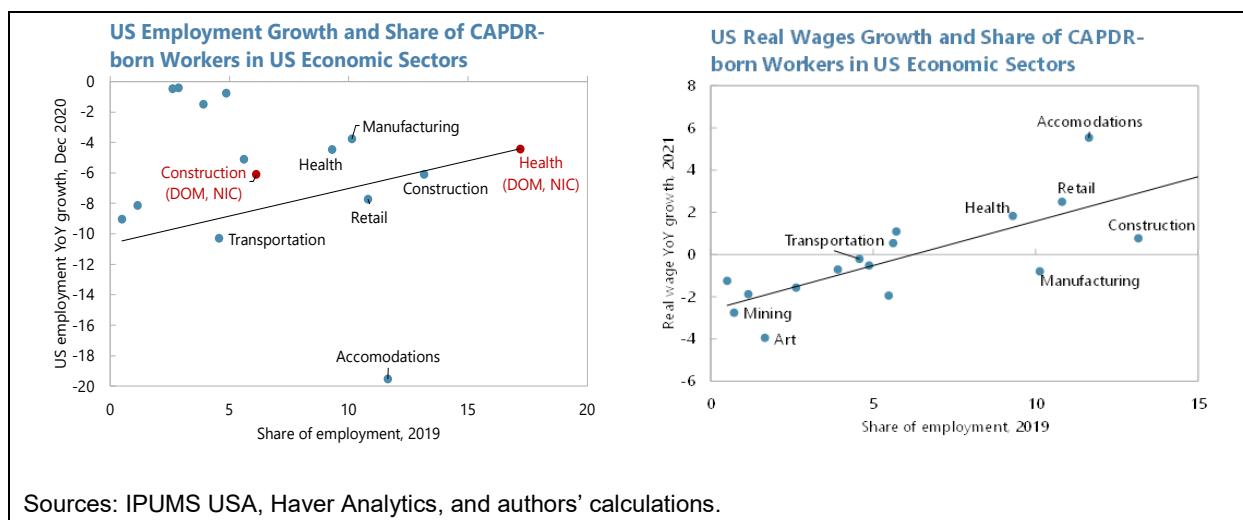
- COVID-19 infections at home abated with the rise in vaccinations, although increased seasonally from July until September;



- Considerable additional fiscal support was available in 2021 as well, other than the one captured in our estimations. For example, the CARES Acts included three stimulus checks, distributed in April 2020, December 2020-January 2021, and March 2021. Those months have seen an increase in remittances to CAPDR (see the corresponding increases in aggregate remittance growth in red in the text right chart below);²²
- U.S. employment gains in the sectors where CAPDR migrants work preponderantly (see chart). By end-2021 the U.S. economy gained about five percent employment in the total non-farm sector, but 18 percent in accommodation (leisure and hospitality), where a fifth of migrants work;

²² In addition, the American Rescue Plan approved in 2021 included tax child credits distributed as checks between July to December 2021 for eligible families.

- U.S. real wage growth gains in the sectors where CAPDR migrants work preponderantly. Overall, the average weekly earnings in the non-farm sectors increased by five percent in 2021 in the U.S., but the accommodations sector had 6 percent average growth in average weekly earnings, with many months of real wage increases above 10 percent (chart). These growth rates were much larger on average compared to the previous year (more than five times for accommodations and double in construction compared to 2020).



VII. Conclusions and Path Ahead

Remittances to CAPDR and Mexico are well explained by the “altruism” model. Data since January 2000 until end-2020 shows that, historically and at the incipient stages of the pandemic, remittances to five CAPDR countries (Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua) and Mexico are well explained by an “altruism” model. Remittances increased with a decline in U.S. Hispanics unemployment and deterioration in the recipient country economic conditions (decline in the manufacturing production or in the relative purchasing power—a real effective exchange rate depreciation).

Over time, remittances recovered, with an increase in the number of transactions, while the average amount remitted remained relatively constant. The upward trend in the number of transactions corresponds to increased migration from these countries to the U.S. The average amount remitted is highly elastic to changes in the U.S. real wage (at least as estimated for El Salvador).

During the pandemic, total remittances could still be explained by traditional models, and the behavior in the number of transactions until June 2020. A pVAR model captured well the sudden plunge and subsequent fast rebounding aggregate remittances until June 2020. The model substantially underpredicts the dynamics of aggregate remittances thereafter. Historically and until June 2020, the pattern of aggregate remittances is also mostly explained by the number of transactions.

The increase in total remittances in the second half of 2020 is explained equally by an increase in the number of transactions and an increase in average amount remitted. With the pandemic-related restrictions and immigration backlogs, the stock of immigrants in the U.S. from CAPDR remained relatively

unchanged in 2020, although as documented by Orozco and Martin (2022), increased from Mexico. At the same time, more immigrants already living in the U.S. seemed to start sending money to their countries of birth. Migrants that otherwise would have spent their funds on travel and gifts to family before, and not remitting, chose to send those funds digitally instead in 2020. Furthermore, in the second half of 2020 an increase in the average amount remitted seemed to have contributed equally to the increase in aggregate remittances. This was a trend observed somewhat in the second half of 2019, but not before.

The increase in the average amounts remitted in the second half of 2020 is primarily explained by U.S. real wage growth, U.S. unemployment relief and pandemic developments at the Salvadoran department level. El Salvador is one of the largest recipients of remittances in the region and has one of the best databases to analyze these developments. Data for 314 corridors (from 23 U.S. states to 14 El Salvador departments) was analyzed at monthly frequency, from January 2017 to December 2020. The recorded increase in the average amounts remitted since July 2020 compared to the same month in 2019 is primarily explained by increases in U.S. real wage growth, U.S. unemployment relief (including exceptional pandemic relief), and COVID-19 cases in Salvadoran departments. In addition, all other elements of U.S. fiscal stimulus may have helped, as well as additional state-level support extended especially where CAPDR and Mexican migrants work.

The developments in the U.S. labor markets, particularly in the sectors where the CAPDR and Mexican migrants work, also explain remittances growth in 2021. By end-2020, while the U.S. Hispanic unemployment declined rapidly, some employment losses remained, especially in the sectors where CAPDR migrants preponderantly work. Those losses were mostly recovered by end-2021. Moreover, in the same sectors (accommodations, retail trade, etc.), average weekly earnings increased above the average increase observed for the economy, and those increases were much more preeminent in 2021. Since the estimated high elasticity of the average amount remitted to the U.S. real wage growth is high this, along with many other temporary and one-off factors explain well the high growth in remittances observed in 2021.

Looking forward, remittances growth to CAPDR and Mexico is expected to moderate. We expect remittances to grow over time primarily due to an increase in the volume of transactions, as migration has picked up, and is expected to continue. Moreover, average amount remitted will grow over time with U.S. real wages. In addition, remittances might grow in periods of hardship at home due to the altruistic motive (pandemic, or other negative shocks at home). In the short-term, remittances growth will depend on U.S. sectoral labor developments, especially in employment and real wage gains in accommodations, where migrants from the region preponderantly work. Changes in the modes of transfers (through digital payments) may also contribute to an increase in remittances, by decreasing the cost of remittances transfers, thereby potentially increasing the average amount remitted, and/or by capturing additional migrants that do not use banking services.

Annex I. Alternative Measure of Economic Conditions in the Recipient Country: the IMAE Agriculture

Annex Table A1: Determinants of Remittances Flows (Fixed Effects Regression Model)

Dependent variable: y-o-y growth rate of aggregate remittances flows in constant	
	(1)
U.S.: Hispanic unemployment rate	-1.268*** (0.000)
U.S.: Building permits	0.019 (0.213)
Recipient country: IMAE Agriculture	0.099** (0.029)
Interest rate differential	-0.229 (0.241)
Inflation differential	-0.528*** (0.005)
REER	-0.158** (0.011)
Number of observations	880
All variables are in y-o-y growth rates. Standard errors reported in bracket. Maximum period is from 2000M1 to 2020M12 *n<0.10 ** n<0.05 ***n<0.001	

Annex II. CARES Act's Unemployment Insurance Support¹

The CARES Act, passed in March 2020, introduced over US\$3.4 trillion in federal spending to bolster the state administered unemployment programs, support to businesses through low interest, and Paycheck Protection Loans (PPP Loans). The CARES Act and its followed iterations (Consolidated Appropriations Acts, CARES Act II), along with the American Rescue Plan introduced in 2021 sustained many households with stimulus checks, and businesses. The combined federal spending allowed for US\$1.52 trillion unemployment benefits and employee retention (US\$590 billion and US\$930 billion allocations, respectively). They expired in November 2021.

In particular, the CARES Act expanded eligibility for state unemployment insurance to include the self-employed and individual contractors. As a result, there were two tracks of beneficiaries—track I included eligible recipients of traditional unemployment insurance (UI) benefits and track II included non-eligible recipients of traditional UI benefits—usually those without sufficient work history, self-employed, part-time workers, or otherwise not eligible.

Track I participants used the existing State Administered UI programs, with usually coverage of 26 weeks on average (depending on the state). Once the individuals exhausted the regular UI benefit, they were eligible to receive additional (non-overlapping) benefits, for a total duration of additional 53-60 weeks (depending on the state), as follows:

- Pandemic Emergency Unemployment Compensation (PEUC) for individuals who exhausted the traditional UI benefit.
- Extended Benefit for individuals who exhausted regular UI and PEUC benefits; and
- Pandemic Unemployment Insurance (PUA);

Track II participants were able to participate in the PUA program only for a duration up to 39 weeks.

In addition to the pandemic-related UI programs, there were supplementary benefit programs, such as Federal Pandemic Unemployment Compensation (FPUC), Mixed Earners Unemployment Compensation (MEUC), Trade Readjustment Allowances (TRA), and additional state benefits.

Taken all together, the provision of various UI program resulted in 5 out of 6 workers receiving benefits in excess of their previous earnings—for the median workers benefits amount to 134 percent of earnings (See USA Article IV Staff Report 2020, Box 5).

¹ https://wdr.doleta.gov/directives/corr_doc.cfm?DOCN=3831

Annex III. U.S. State-Run Support Programs

The federally sponsored COVID-19 relief packages apply to documented workers only. However, some state and local jurisdictions extended COVID-19 relief benefits per occupation rather than legal status, thereby providing access to undocumented workers through special allocations and emergency. Coverage guidelines vary and are determined by states, including at least 12 states which extended the coverage. The largest push for undocumented worker relief were fostered by California state and New York city, especially for the workers in the hospitality business (restaurants).

California state's program is estimated to have reached 150,000 undocumented workers via direct one-time cash payments. The Disaster Relief Assistance for Immigrants Fund (DRAI) is structured similarly to programs around the country and provided one-time cash bonus of US\$500 capped at US\$1,000 per household. The California legislature designated US\$75 million to help undocumented workers unable to access any other form of disaster relief. Private donations in the amount of US\$50 million were added to support this program.

New York city's allocation of US\$2.1 billion for its excluded workers is the largest in the country. The one-time payments of up to US\$15,600 per household were meant to help workers who are unable to qualify for any other form of unemployment benefit or COVID-19 relief aid. To be eligible, applicants were required to have lived in the state prior to March of 2020, resided in the state at the time of application, and excluded from being eligible for any other the unemployment or COVID-19 income related benefits. Additionally, only those with gross annual income below US\$26,208 and who have lost 50 percent or more of this income were eligible.

In Washington DC's, a US\$5 million fund was allocated to support undocumented workers via local non-profit organizations, in addition to the US\$15 million program for documented workers.¹ Similar to the California state program, the DC program included one-time benefits of US\$1,000 per family, which were distributed through US\$500 pre-loaded debit cards.

In Maryland, Montgomery County's benefit plan was similar for individuals, but more generous for families. Single individuals could receive as much as US\$500, and families could receive as much as US\$1,000 for a family with one child, and US\$150 for each additional child, with a maximum benefit of US\$1,450.² The program run between April 2020 and June 30, 2021.

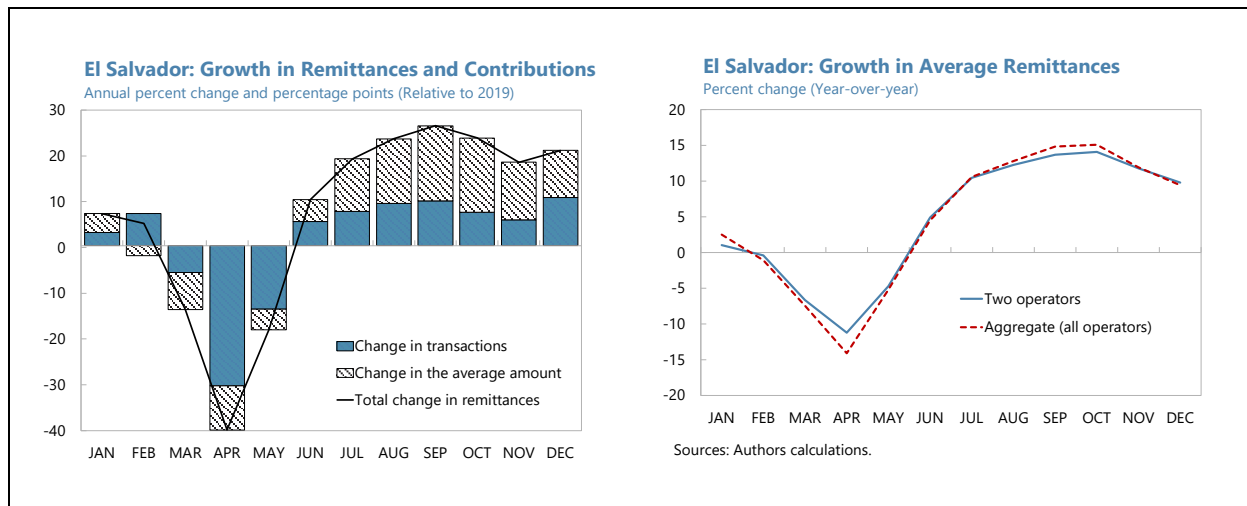
In addition to programs that provide direct COVID-19 relief payments, there are several programs in place that offer assistance to undocumented workers by not expressly having an immigration status requirement. These programs are often in the form of rental assistance programs or forgivable small business loans. California offers both programs, including in US\$100 million of rental assistance subsidy and in US\$50 million for small business relief. The former is the largest program of its kind in the country and looks to help an estimated 50,000 households. Chicago, Illinois offers similar programs including a US\$2 million fund for housing assistance and a US\$100 million fund to bolster small business through forgivable loans. Both programs are accessible to residents regardless of citizenship status.

¹ <https://dcist.com/story/20/06/09/d-c-lawmakers-approve-5-million-in-funding-for-undocumented-workers-impacted-by-the-coronavirus-crisis/>

² <http://www.dclabor.org/legislative-updates/montgomery-county-excluded-workers-fund-launches-today>

Annex IV. Remittances Data per Corridor

The data sample is representative for the aggregate remittances data. We used data from the two major remittances operators, which account for 17 percent of transaction and 14 percent of value of remittances in 2019. Similar to the aggregate remittances data, our dataset of the two remittances operators showed that most of the growth in remittances to El Salvador was due to increase in the average amount of remittances. Moreover, growth in the average value of remittances per transaction in our sample tracks very well the growth rates of average value of remittances per transaction for the country (for all operators).



Annex V. Correlation Matrix for Model Explaining of Average Amount Remitted

2017:1--2020:12						
	US: Average remittances	US: Real wage	US: Unemployment insurance per unemployed	US: State mobility	SLV: New COVID cases	SLV: Government transfers per household
US: Average remittances	1					
US: Real wage	-0.0122	1				
US: Unemployment insurance per unemployed	0.0961	0.3049	1			
US: State mobility	0.09	0.05	-0.1691	1		
SLV: New COVID cases	0.1823	0.1993	0.6413	-0.0401	1	
SLV: Government transfers per household	-0.0066	0.1201	0.4105	-0.0881	0.208	1
2017:1--2019:12						
US: Average remittances	1					
US: Real wage	-0.0394	1				
US: Unemployment insurance per unemployed	-0.0132	0.2245	1			
US: State mobility	0.0997	0.0738	-0.1948	1		
SLV: New COVID cases						
SLV: Government transfers per household	0.0896	0.0894	-0.0472	0.0061		1
2020:1--2020:12						
US: Average remittances	1					
US: Real wage	-0.04	1				
US: Unemployment insurance per unemployed	0.0881	0.2195	1			
US: State mobility	0.0987	0.046	-0.112	1		
SLV: New COVID cases	0.2469	0.1319	0.5129	0.024	1	
SLV: Government transfers per household	-0.2404	-0.0857	0.1619	-0.1396	-0.3449	1

Annex VI. Robustness of Results for the Model Explaining Average Amount Remitted

Table 4: Determinants of evolution of average value of remittances (2017:1–2020:12)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Constant	-0.187 (0.193)	0.396* (0.230)	-0.670*** (0.217)	-0.385* (0.216)	-0.979*** (0.207)	-1.874*** (0.201)	-1.983*** (0.203)	-1.018*** (0.185)	2.158*** (0.239)	0.749*** (0.232)	-0.385* (0.216)	0.741*** (0.232)
US: Real wage	0.937*** (0.032)	0.825*** (0.040)	0.856*** (0.037)	0.861*** (0.037)	1.073*** (0.035)	1.093*** (0.033)	1.137*** (0.033)	1.099*** (0.031)	0.548*** (0.041)	0.641*** (0.039)	0.861*** (0.037)	0.673*** (0.039)
US: Unemployment insurance per unemployed		0.006*** (0.001)	0.019*** (0.001)	0.019*** (0.001)					-0.003* (0.001)	0.011*** (0.001)	0.019*** (0.001)	0.012*** (0.001)
US: State mobility			0.216*** (0.008)	0.144*** (0.012)		0.219*** (0.010)	0.178*** (0.007)			0.202*** (0.008)	0.144*** (0.012)	0.158*** (0.012)
US: Unemployment rate					-0.427*** (0.039)	0.308*** (0.050)						
SLV: New COVID cases				-0.023*** (0.003)				-0.044*** (0.002)			-0.023*** (0.003)	-0.014*** (0.003)
SLV: Government transfers per household									0.053*** (0.003)	0.041*** (0.003)		0.037*** (0.003)
Number of US states	23	23	23	23	23	23	23	23	23	23	23	23
Number of SLV departments	14	14	14	14	14	14	14	14	14	14	14	14
Number of panels	322	322	322	322	322	322	322	322	322	322	322	322
Number of observations	15072	15072	15072	15072	15072	15072	15072	15072	15072	15072	15072	15072

All variables are in natural logarithm form.

Estimated with Feasible Generalized Least Squares with panel-specific autocorrelation AR(1) specification and heteroscedastic error structure. Standard errors reported in brackets.

* p<0.10, ** p<0.05, *** p<0.01

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