The Journey of a Remittance in the US-Mexico Corridor: From My Salary to My Family

Batiz-Lazo, Bernardo and González-Correa, Ignacio

Northumbria University Universidad Anahuac, University of California, Davies

August 2022

The Journey of a Remittance in the US-Mexico Corridor: From My Salary to My Family[1]

By Bernardo Bátiz-Lazo and Ignacio González-Correa

1. What is a family remittance?

There are different but complementary ways to describe the type of cross-border payments we discuss in this brief paper. Alternative definitions for 'remittances' include that of the National Council for Population (Consejo Nacional de Población or Conapo): 'funds coming from another country, originated by a sender, resident abroad, who transfers resources to his relatives in national territory'; or the Mexican central bank, Banco de México: 'unilateral transfers from a resident abroad to a resident in Mexico for the purpose of contributing to the (financial) support of the latter'.[2] For one of our interviewees, an expert working for years in this market, remittances should be understood as a cross-border payment between relatives (or friends) essentially made by cash through 'remitter' companies, that is, Western Union, MoneyGram, among others. If the cross-border payment is made by a wire transfer through banks, then it should not be considered as a 'family remittance' but a service provided by a bank or Fintech company.

As we will be evident below, remittances are largely a phenomenon of Mexican migration to the USA, which overwhelmingly originate and are paid in cash and travel through a unique financial infrastructure. As a result, we define 'family remittances' simply as the cash transfers of resources from people working in the United States to their relatives in Mexico.[3] The sender is a migrant worker, permanent or temporary, who can be documented, or legal, or undocumented, illegal, Mexican-born or offspring with at least one parent born in Mexico. Beneficiaries are family members, typically a female – mother, close relative, or spouse – who are resident in Mexico.

2. Introduction

Cross-border payments are vital to economic prosperity, international trade, global financial stability, international travels, access to capital, growth of international e-commerce, and poverty reduction. But why is everybody talking about international remittances? There are two potential answers to this question. The first reason is the growing volume and value of family remittances (and their impact on low-income economies), and the second is the United Nations' 2030 sustainable development goals.

As noted in The Financial Times,[4] family remittances are the human face of international capital flows. Twenty years ago, in 2000, global inflows were 100 billion dollars and steadily increased to 689 billion dollars in 2018. Today, in 2022, India, China, and Mexico are the top three destinations for family remittances in US dollar inflows. Meanwhile, remittances to Haiti, El Salvador, and Honduras observe the highest proportion of their value as a percentage of Gross Domestic Product (GDP), reaching over 20 percent of the GDP for the two Central American

Nota bene: *This work was conducted as an independent 2022 research project on central bank digital currency and financial inclusion, in collaboration with Maiden Labs and the MIT Digital Currency Initiative, and funded by the Gates Foundation. This work does not represent the views of any of the partners. The usual caveats apply.*

countries.[5] To put these trends in a larger perspective, in the early 2000s, Foreign Direct Investment (FDI) was the primary source of capital inflow to emerging countries, but in 2019 remittances overtook FDI as the most significant capital inflow to emerging economies.[6]

Remittances worth 707 billion dollars passed through the system in 2019, 529 billion dollars to people in low- and middle-income countries, associated with an average of 6.82 percent per transaction in fees. For this reason, the G20 has prioritized improving cross-border payments and asked the Financial Stability Board (FSB) to propose solutions. In addition, the United Nations set a goal of reducing remittance fees to at least 3 percent per transaction by 2030.[7]

Remittances allow families to cover essential consumption in receiving countries but also make up deficiencies in weak or non-existent capital markets.[8] In Mexico and Central America, they sometimes serve as capital for business purposes.[9] For example, in early 2000, a study of small firms in urban Mexico found that within the ten states with the highest migration rate to the United States, almost a third of the capital invested in microenterprises was associated with remittances. Nevertheless, they also contribute to 'hiding' and underestimating poverty.[10]

The outbreak of the COVID-19 pandemic led many international institutions to predict a reduction in remittance volume and value while expecting a significant increase in unemployment. For instance, in April 2020, the World Bank estimated that worldwide remittance volume could fall as much as 19.9 percent that year. However, even though the COVID-19 crisis impacted the US (and world) labor market, those predictions failed.[11] For instance, initially, the unemployment rate of the Mexican migrant population in the USA increased from 6.6 percent in March to 17.1 percent in April 2020. But by 2021, employment had already recovered. Between May and June 2021, unemployment stood at 4.7 percent.[12]

In what follows, we discuss some of the developments around remittances related to the advent of the digital economy. We present general trends in the market in the next section. Section three approximates the market structure and maps the 'journey' of a remittance initiated in cash or digitally. This section also considers the three strata that operate in the market, as well as a brief consideration of conflict resolution. The fourth and last section concludes with a reflection on the potential impact of central bank digital currencies in the US-Mexico remittance market.

3. General trends in the US-Mexico corridor

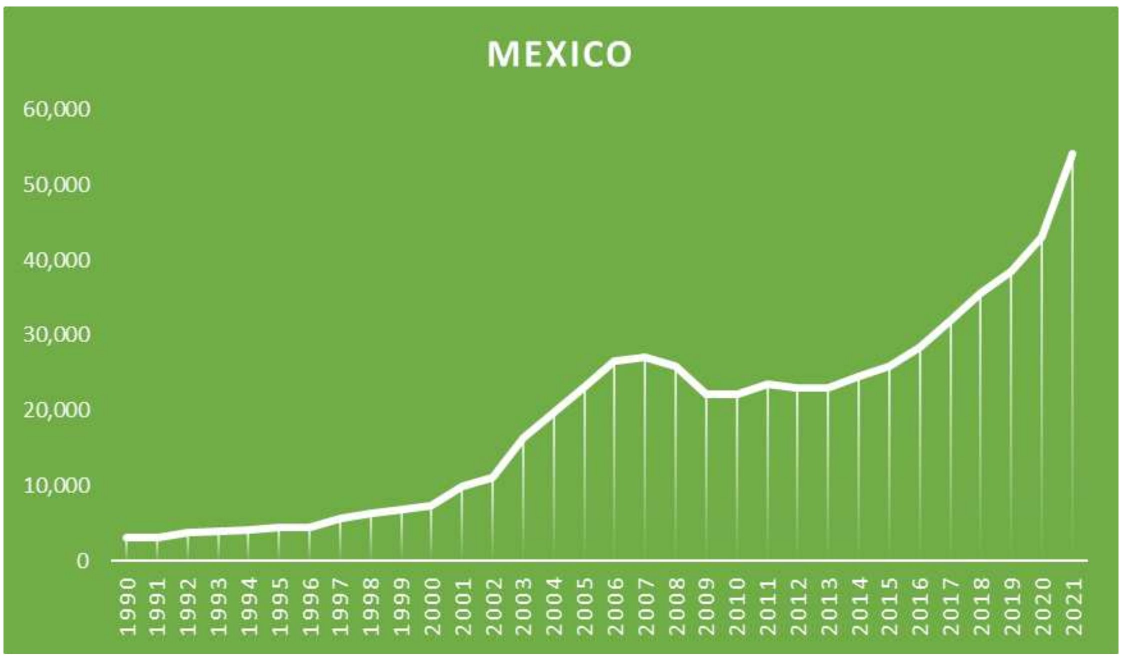
a. Evolution

Since the 1960s, Mexico's most important foreign income flows have emerged from oil exports, tourism, FDI, and international inbound production (i.e. the maquila industry). However, the accelerated growth in family remittances since 2000 turned it into one of the country's primary sources of foreign exchange income, see Figure 1. Here one must consider that illicit trade in drugs probably dwarfs all of the other activities in terms of foreign income generation. Still, it is hard to ascertain its magnitude, given it is not recorded in the national accounts or as a separate item in the balance of payments (shadow economy).

According to Jonathan Heath, in 2001, remittances to Mexico surpassed tourism, while the accumulated flow of remittances from 2006 to 2010 surpassed FDI by more than 10 billion dollars in the same period.[13] In 2009 remittances were more than double the income from oil exports (despite that year observing a downturn in annual remittance transfers). Since 2010, the automotive industry has been the only licit export activity that exceeds foreign income generation from remittances by a significant margin.

Data in Figure 1 suggests how, despite the increase in US unemployment during COVID related lockdown, the volume and value of world remittances, particularly those to Mexico, continued to grow. In 2020, remittances to Mexico reached 40,601 million dollars.[14] This was their highest point in the previous decade (3.8 percent of GDP), observing over 10 percent of GDP in five states (Michoacán, Guerrero, Oaxaca, Zacatecas, and Nayarit). Some of these states are among the largest providers of migrants. Between 2015-2020, Mexican migrants came mainly from Guanajuato, Jalisco, Michoacán, México, Ciudad de México, Veracruz, Oaxaca, and Puebla.[15]

Figure 1. Foreign remittances to Mexico (millions of dollars, 1990-2021)



Source: KNOMAD/World Bank (2022).[16]

Even though thousands of immigrants and Latino workers were initially laid off, they still managed to send money to their families in Mexico and Central America to help fight the pandemic.[17] The reasons that explain these results include the fact that Hispanic employment was one of the fastest sectors to recover lost jobs in the US, large-scale federal and state assistance for unemployed workers (particularly that in California, which concentrates the most significant number of Mexican migrants), and the little funding from Central American governments to help people see the lockdown through. Migrants to the USA thus proved to be supportive, loyal, and caring to their commitments and relatives across the southern border.

The growth of remittances during 2020 and 2021 was not unique to Mexico. For instance, while Mexico observed an increase of 27.1 percent in remittances at year-end 2021, those to Guatemala increased by 34.9 percent, 26.8 percent in El Salvador, 26.6 percent in the Dominican Republic, 24.4 percent in Colombia, and by 20.4 percent in Jamaica.[18]

After observing an annual increase of 19.6 percent in January 2022, in April 2022 remittances to Mexico reached 24 months of continued and sustained growth recording 47,180 million dollars or 16.5 percent annual growth.[19] However, industry participants considered that growth rates oscillating between 20 and 35 percent of volume (up from a previous average of 4 to 5 percent) could not exclude the possibility of greater malfeasance in the remittance channel by criminals (and particularly the drug trade) during the pandemic, this has neither the number of migrants nor migrant pay has risen at a pace of 20 percent per year. Hence, by this back-of-an-envelope estimate, we can assume substantial money laundering is taking place. More below.

Remittances to Mexico have diverse origins, such as Canada (649 million dollars in 2020), the United Kingdom (124 million dollars), Ecuador (98 million dollars), Chile, Colombia, and Spain (each sending approximately 50 million dollars in 2020). But all of these are dwarfed by those from the United States (38,761 million dollars or 95 percent of the total in 2020). For this reason, remittances are largely a phenomenon of Mexican migration to the USA. We define 'family remittances' as the transfers of resources from people working in the United States to their relatives in Mexico.[20] Although there have been significant increases in bankarization and financial inclusion throughout the years, the journey of a remittance overwhelmingly starts and ends in cash. See below.

The increase in remittances is linked to the growth of migrants who, in turn, respond to the demand for labor of (primarily but not exclusively) agricultural and construction workers. Remittances are thus a direct form of salary income substitution for most recipients. Only in a handful of cases do they complement small investments such as house refitting, church construction or even micro business.[21] As a form of income, Mexican migrant workers receive a higher income at the destination than in their home location but at a lower salary and benefits than other US domestic workers. Migrants are seldom at the bottom end of the social pyramid as they are usually skilled or semi-skilled, and recipient families are seldom benefiting from government subsidies. Migrants also need the (informal) credit capacity to pay for the voyage north, which can be between 3,000 and 7,000 dollars.

Remittance growth now in 2021 includes approximately 32 percent of transfers initiated by women migrants.[22] There is also an increasing number of indigenous ethnic group migrants, representing between 6 and 10 percent of total transfers and aimed at locations which had not been traditionally identified with migrant workers.[23]

b. A death star: remittances lose their sparkle

There is a dark side to family remittances. Firstly, the increase in disposable income comes without increasing productivity. Mexico is a nation where 60 percent of the employed population earned between one and two minimum wages in 2021, that is, between 142 and 284 pesos a day (between 7 and 14 dollars a day), remittances are a lifeline for the families lucky enough to receive them (around 1.8 million families), as well as for the economy as a whole, at least in terms of its balance of payments.[24] These figures suggest that nearly 60 percent of economically active Mexicans are employed in the informal sector and generate 23 percent of GDP, while around 40 percent of Mexicans are employed in the formal sector and contribute 77 percent of GDP; in other words, productivity in the formal sector is three times higher than that in the informal sector. But there should be no illusions that these remittances will bring Mexico out of its backwardness, since 95% of this extraordinary income is dedicated to the purchase of food, housing, education, or health by the families that receive it, but no major investments are made from it, it barely keeps these families afloat, and they would otherwise swell the ocean of almost 60 million poor people in Mexico. Thus, the best social program to combat poverty is to generate the conditions for the creation of more formal, well-paid jobs.[25]

Unfortunately, migrant employment is taking place outside national borders. In 2018 there were 11.2 million Mexican migrants (born in Mexico) living in the United States (although there are more than 37 million people of Mexican origin in that country) which reflects that there has long been a desire to find a better life in that nation.[26] Why has Mexico failed to provide opportunities for Mexicans to find decent work options in their own country in the first place? The answer would far exceed the space of this article. Nonetheless, remittances are sent after migrants pay for federal, state, and local taxes including contributions to social security – with very few of them actually benefiting or making use of those contributions.

Because family members are receiving a higher income than at their origin (remuneration in the USA can be up to ten times higher than in Mexico), remittances also skew poverty estimates. It is unclear whether remittances incentivize individuals to remain in a cash economy and the informal sector.

In any case, it is clear that remittances are fundamental for Mexican macroeconomic stability and, at the time of writing, the inflow of remittances compensates for a current account deficit while maintaining an overvalued US dollar-peso exchange rate. This reflects the possibility that attracting large volumes of remittances can give rise to the so called 'migration-remittance trap'. According to Sokchean Lim and Channary Khun, remittances in the presence of labor migration hurt the traded sector of the developing economy, leading to a contraction in the aggregate output.[27] The contraction persists even with the expansionary impacts of remittances through a collateral effect. In addition, the migration policy of the developing countries can weaken other development efforts. In other words, the short-term benefits of remittances can lead to shortfalls in productivity and aggregate output in the medium to long-term.

Secondly, a quantitative analysis by Enrique Presburger estimates that US-Mexico remittances will peak before 2040 and then follow a steep decline.[28] This is as individual immigrants will end the commitment to their home country as relatives either die or migrate, the family unit is dissolved, or children grow of age. It is also the case that young migrants return home or, if they stay abroad, acquire financial commitments (such as cars, white goods or mortgages). There have been over 12 million Mexican-born migrants since 1965, of which half took off in the mid-1990s. It is hard to see that trend continuing at the same rate. Moreover, climate change and the current drought in southern USA, could accelerate that trend by reducing employment opportunities and even triggering mass deportations. The nationalistic Mexican President Andres Manuel Lopez Obrador (AMLO) has done nothing to address possibilities for better employment at home or prepare for an eventual downturn in remittance volume or value.

Third, industry experts estimate that no less than 80 percent of total remittance volume relates to licit transfers between family members. There are, however, growing concerns with illicit transfers. On the one hand, there are issues of large amounts of cash transactions around the border (which seem specific to a particular financial intermediary).[29] On the other hand, banks (such as BBVA and Banorte), financialized payers (including BancoAzteca/Elektra, Coppel/Bancoppel), and large payment aggregators (such as BTS and Soriana-owned TransNetwork) typically have significant dedicated resources for Know Your Customer (KYC) monitoring. In addition, the US regulator favors a high market concentration in some segments (such as that of payment aggregators where BTS and TransNetwork control 60 percent of total volume) as that enables participants to swiftly identify potential misuse (such as an unusual number of transfers to/from a single location/account to a single location/account). But that is not the case for many smaller participants, including Fintechs. More below.

Fourth, there is also a body of literature addressing the negative effects of remittances.[30] For example:

- Tanya Basok concludes that remittances are a sort of unconditional cash transfer, mainly used for households' consumption, which impact on development and growth is limited.[31] Indeed, and as noted above, when remittances are used primarily as consumption rather than investment, they might perpetuate economic dependency, which in turn undermines local development.[32]
- A similar conclusion was obtained by Jorge Durand and Douglas S. Massey when reviewing community level studies.[33] Catalina Amuedo-Dorantes and Susan Pozo argue that even when remittances are used as investment instruments, there is no evidence suggesting they promote small business ownership.[34]
- Michael Lipton suggests that remittances may also increase interpersonal and inter-household inequality in rural areas.[35] Filiz Garip finds a similar result but considering repeat migration in Mexico.[36] Garip argues that sustained remittances may amplify the wealth gap between migrants and non-migrants in migrant-sending communities.
- John Gibson and colleagues analyze the migration flow Tonga-New Zealand and find no significant evidence about the impact of remittances on childhood education.[37] Evidence from Mexico suggests that living in a household receiving remittances lowers the chances of completing high school.[38]
- From an institutional point of view, Michael D. Tyburski addresses the impact of remittances on corruption.[39] He finds that in closed regimes remittances might have aggravating effects since they increase political patronage. Faisal Z. Ahmed also finds a negative effect of remittances on governance.[40]

4. The remittance process and the market structure in the US-Mexico corridor

a. Market structure overview

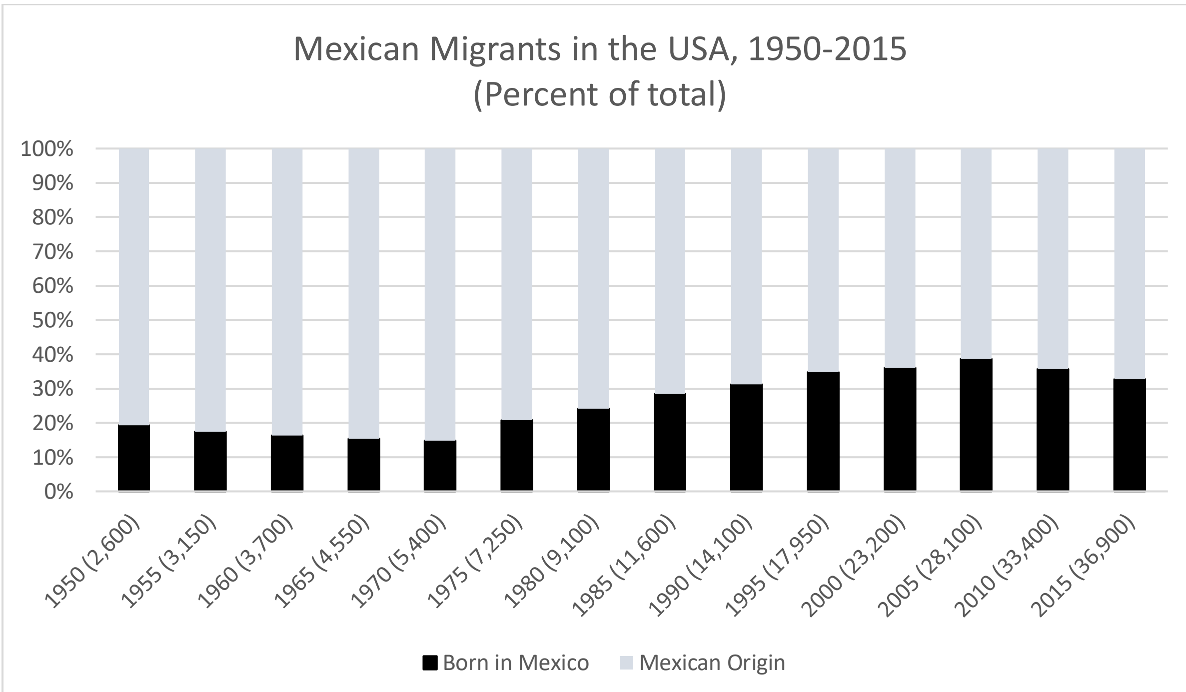
As mentioned above, remittances emerge from the flow of labor across borders. Mexican migration to the United States has a long history. David Escamilla-Guerrero estimates that, between 1870 and 1910, the Mexican-born population grew two-fold to 200,000 inhabitants, while the Mexican origin population was almost 600,000 by 1910.[41] These were mainly agricultural workers who did not aim to settle permanently and had their origin in the central Mexican plateau. The same source estimated that after the end of the Mexican Revolution and World War I, individual border crossings by Mexicans peaked at around 90,000 in 1925. This was followed by mass deportation combined with the economic contraction of labor markets during the Great Depression. Migration returned from 1942 with the executive order establishing the so-called 'Bracero Program'.[42] The program addressed labor shortages during WWII and ended in 1964, while it brought some 4 to 4.5 million legal, temporary workers to US agriculture and railroads. It is estimated that an additional 4 million temporary workers migrated undocumented, illegally, during that period.[43]

But it is the industrialization of agriculture, particularly that of California, which gives migration of Mexican-born individuals renewed 'pull' growth. At the same time, there were some 'push' incentives to migration, including large and widespread unemployment resulting from an agrarian crisis in the 1970s, the economic debacles of 1982, 1986 and 1994, the passing of the North American Free Trade Agreement, as well as insecurity related to the 2005 policy to combat drug cartels.[44] See Figure 2.

Figure 2 depicts estimates by Teodoro Aguilar Ortega, who reckons Mexican-born migrants grew from 500,000 in 1950 to reach 11 million in 2005 or 40 percent of total migration to the USA.[45] The same source estimated there were 2.1 million migrants of Mexican origin in 1950, which grew to 17.4 million in 2005. In other words, these numbers suggest that during the 1970s, there was an average flow of 30,000 migrants per annum, increasing to 453,000 persons p.a. by the late 1990s. The same source estimated that 12 million Mexican-born people and 24.7 million people of Mexican origin had migrated to the United States in 2015. Of these, 50 percent accumulated between 1950 and 1995, and the rest in the following ten years. Meanwhile, interviewees reckon the number of migrants of Mexican origin reached 16 million in 2022.

Other sources estimate that since 2017 there have been more documented (legal) than undocumented (illegal) Mexican migrants to the US. They work in different sectors and live across the United States, but they concentrate in the states of Arizona and California. These migrants are critical for the primary economic sector: 68 percent of California's agriculture workers are Mexicans.[46]

Figure 2. Migration of Mexican Born and Mexican Origin as a Percentage of Total Migration (Total migration in thousands), 1950-2015



Source: Estimates based on Aguilar Ortega (2021, p. 138).[47]

Before the existence of remittance specialist firms, the alternatives for transporting money across borders were through people, postal and telegraph money orders, bank transfer or Western Union. Using individuals to transport money was initiated when someone was going to travel across the border and typically to the same hometown or municipality. Through ‘word of mouth’, news spread, and those interested could request to send money with this person in exchange for a commission (or sometimes without charge). This was subject to crime and fraud.

Postal orders work similarly to a personal check but without the need for a bank account. Instead, the sender purchases an order for the exact amount and then mails it to the recipient. Although this is slow, risks the letter being lost or misplaced in transit, and can only be cashed in a post office branch, it was the most popular way to make remittances in the 1920s.[48] It was also the case that migrants returned with large swathes of cash in their pocket during the ‘Bracero Program’, thus underestimating official estimates.[49] Anecdotal evidence suggests that telegraph orders became popular around 1970.

Around 1980, Western Union had an 80 percent share of transaction volume. Because of technological change and increased competition, that share plummeted to around 30 percent in 1995 and less than 12 percent by 2010. In the early 2000s, there were up to 60 remittance specialists capturing senders' traffic. That number has since halved, with some large banks such as Citibanamex and Santander exiting the market.[50] As a result, there is no participant with significant operations on both sides of the border but a network of specialist firms.

At the same time, the cost of the remittance dropped. This was reflected by narrower foreign exchange spreads and the fee for a single transfer reducing from approximately 30 dollars in the mid-1990s to 10 dollars in 2022. Individual value hovers around 350 (nominal) dollars per transaction, with those over 1,500 dollars less than 1 percent of total volume and modal transaction around 150 dollars. Remittances typically represent between 15 and 35 percent of the migrant's net salary, with up to three transfers per month.

As mentioned, family remittances are largely initiated and are distributed in cash. It is estimated up to 90 percent of the volume starts and ends in cash. However, some players like BBVA and Coppel (through its banking arm) have successfully increased financial inclusion through prepaid cards. Specifically, while the volume of remittances grew between 2015 and 2022 from 14 to 18 million transactions for BBVA, the number of electronic transfers to prepaid cards reached 85 percent of transactions. Prepaid (N2) cards enable recipients direct transfer through a SPEI number (i.e., the Mexican real-time payment system) and access to ATM withdrawals but without credit scoring and other forms of verification required by bank accounts.

Some remittance companies have enabled several forms of electronic transfers with no uptake from customers who, as mentioned, prefer to send and receive cash. This phenomenon is rooted in negative experiences in the banking sector, particularly high commissions and poor service. Beneficiaries found that small balances in bank accounts would soon disappear thanks to high service commissions. However, recipients seem increasingly to demand ways to diminish the use of cash, partly because of the crime risk and partly because of the inconvenience of visiting a particular distribution agent in rural areas.

Providers and particularly payers such as Coppel (a retail company with 1,600 retail outlets) and Oxxo (a network of 17,400 convenience stores in Mexico) have, so far, not been as successful as BBVA's move. For instance, the Oxxo-Citibanamex 'Saldazo' prepaid card was a hugely lucrative business during the pandemic. However, the bank ended the issuing of new cards in April 2022 primarily, it seems, for KYC regulatory concerns.

Until recently, Oxxo was limited to paying no more than 170 dollars or 3,000 pesos per transaction through its 17,400 outlets in Mexico, far below the average remittance of 370 dollars. Elektra (a white goods retailer with some 7000 stores across the country) as a point of distribution for Banco Azteca is not subject to the same limitation.[51] However, at the end of 2021, Oxxo's parent FEMSA bought Spin, a Fintech payments specialist, and started issuing N2 (prepaid) cards to customers,[52] a strategy that would allow it to expand its distribution of remittance by enabling a digital wallet storing up to 19,000 pesos (approx. 700 dollars) [53]

Meanwhile, Fintechs such as Xoom by PayPal, Wise, Remitly and Global66 represent a very small portion of family remittances (estimated to be around 10 percent of total volume). These intermediaries work primarily with middle of the pyramid, banked individuals, and medium-sized businesses while offering cost, convenience, and better service alternatives to banks. Fintechs face problems for greater market penetration not only because cash remains king in small payments but also because they have to invest large resources to develop appropriate KYC monitoring and dedicated customer attention centers for dispute resolution.[54]

b. A customer's perspective of a cash remittance

As will be discussed, remittance customers typically only interact with the start or end point in the journey of a remittance. The transaction is initiated by the sender and finalized by the recipient (or beneficiary). Which market participants take part in the transaction depends on specific decisions made by the sender.

Let's exemplify this by considering someone sending a (cash) remittance from the United States to Mexico. Assume that the sender is a Mexican migrant woman (called Lucía) who recently started working in agriculture in Soledad (Salinas Valley), California. Lucía wants to help support her mother (María), an elderly woman living in Jaripo, Michoacán.

Even if she is an undocumented migrant, it is likely that Lucía receives her income in some form of bank account, typically through a personal check or an N2 (prepaid) card. Only 6 percent of American women over 15 years of age in 2017 may not have access to a bank account.[55] However, like most migrants her remittance will be initiated in cash by cashing the cheque at the agent or through an ATM withdrawal (device which could well be located in an agent's premises and for which the agent might earn additional fee income).

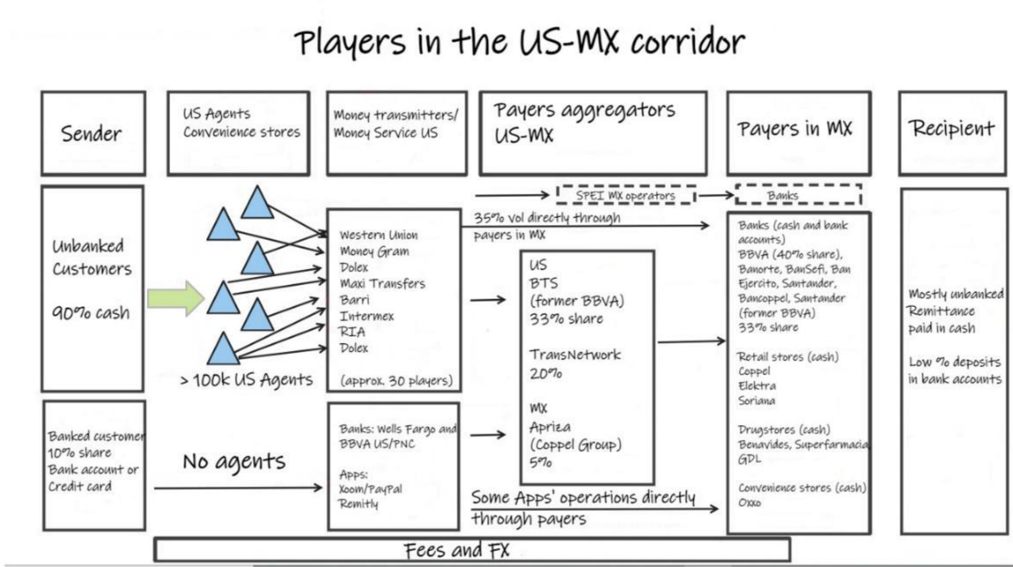
Lucía will typically opt for a 'tried and tested' 'payment rail'. See Figure 3. This point is relevant since a critical aspect that concerns most people initiating the remittance process is the uncertainty surrounding the funds transfer.[56] Migrants have a very small threshold for failure, while others, like indigenous people, do not even read and write in Spanish, let alone in a second (or third) language. Therefore, Lucía will enquire with a friend, co-worker or be guided by a shop steward (often called 'majordomo' or butler) while agreeing with María on the time, date and point of collection.

It is therefore unlikely that as a result of peer recommendation or 'word of mouth', Lucía will shop around for a 'remitter' company ('remesadora'), that is, an international fund transfer specialist. Some well-known and long-established 'remitters' are MoneyGram and Western Union, while medium-sized remitters include Dolex and Maxi Transfers. Although there is an increasing number of remitters that have opened their point of contact with customers (both digital and 'bricks and mortar' offices), it is most likely that Lucía will initiate contact at an outlet that acts as an agent of the 'remitter'.[57] The latter are quite diverse: the agent can be a grocery store, a gas station or a corner shop.

Being an agent for a remitter in the United States can be a lucrative business because it adds foot traffic (the same individual will visit one to three times per month) and generates fee income.

Agents can earn up to 50 percent commission on the fee paid by the sender. The average commission fee for remittances in 2022 was around 8-10 dollars (half of the 20-30 dollars per transaction in the late 1990s and early 2000s).[58] So, an agent will earn an average of 5.00 dollars per transaction. In some instances, remittance fees can be the top revenue-generating item for an agent. In addition, the agent can be host to more than one remitter company, offering more options and increasing revenue opportunities.

Figure 3. Competitive Structure for a Cash Remittance in the Mexico-US Corridor, 2022



Source: authors based on interviews with market participants.

During the process of sending funds, the exchange rate offered by the remitter will be the second type of cost that Lucía will face. This will affect the amount of money María will receive. The foreign exchange rate offered by the remitter is less favorable than the market exchange rate. For example, if Lucía has 200 dollars to send to her mother in Michoacán, then at the mid-market exchange rate of 1 dollar = 20.42 Mexican pesos, the transfer would be equivalent to 4,084 Mexican pesos. Lucía must pay 10 dollars transfer fee. Therefore, she is left with 190 dollars (3,880 Mexican pesos) before conversion. Assume that the exchange rate offered by the remitter was 1 dollar = 18 Mexican pesos, then María would receive 3,420 Mexican pesos. In short, the initial 4,084 Mexican pesos (200 dollars) ends up being 3,420 Mexican pesos for the recipient.

The agent will take Lucía's cash or debit card, and through an application in its cash register, it will inform the remitter that a transaction has occurred. It will also provide Lucía with a receipt, which includes all the relevant information for the transaction, including a unique identification number. In cases where the cash register is down or other IT problems, the sender can contact the remitter through a dedicated line within a bank of telephones in the shop.

Although casual observation suggests that there is increasing use of social media and chat apps by migrants through which they can communicate in real-time with recipients, many of the agents will gift the sender with a free phone call to the recipient. Senders can then provide information on the day, time, amount, and other information related to the transfer transaction. This helps in reducing uncertainty.

Behind the scenes, the remitter, such as MoneyGram or Maxi, is licensed at the state level to carry out this transaction. At the start of the day, the remitter must prepay the estimated transaction volume to a 'payer aggregator'. This is based on estimates of total remittances for the day the remitters will pay an amount in dollars to the 'payer aggregator'. In turn, the aggregator will inform payer companies in Mexico, such as Elektra or Oxxo.[59] The latter do not earn as much money with the commission for remittances as they earn with the public traffic in their stores. It is increasingly the case that remitters contact payers directly, bypassing aggregators. This is possible if remitters have an account in pesos. As in the previous point, the remitter will advance the payer an estimated amount for the day and will top up at the end in case of having overspent.

In general terms, the ‘remitters’ do not directly connect with the banks in all countries, so these firms function as intermediaries. To ensure the necessary amount of foreign currency, the payer aggregators have exchange desks and make the offer to ‘remitter’ firms to cover the daily differences in the amount of foreign currency that the ‘remitters’ acquire to function day to day.

The payer aggregator will process the transactions for the ‘remitters’. As mentioned, 60 percent of the aggregator volume is concentrated by BTS and TransNetwork. They are in a unique position to verify deviant flows of transactions, something that remitters find hard to do (even though remitters are also subject to KYC compliance). The aggregator does not inform payers about individual transactions but credits their account in pesos on behalf of the remitter.

In Mexico, María must make her way to the agreed place to receive the remittance. Unfortunately, there is no single-payer that has full geographical coverage, hence why Lucía enquired which remitter to use. The ‘word of mouth’ recommendation will assure her there is a working ‘payment rail’ to a conveniently located payer to Maria, even if a different remitter could enable the channel with the flip of a switch.

Family remittances are usually transferred out of office hours and even over the weekend. If Maria is in possession of an N2 (prepaid) card, she could access her funds promptly through the large ATM networks of BBVA, Banorte or Banco Azteca.[60] However, here is where gaps in access to the financial system in Mexico become most evident. Suppose that María, like 63 percent of Mexicans, does not have access to a prepaid card or bank account.[61] Maria must therefore travel to the ‘bricks and mortar’ outlet of a payer. These institutions are companies that operate as agents of remitters in the United States. They are grocery stores, retail shops, pharmacies, etc. Among these options with greater geographical coverage, we can mention Elektra, Oxxo, Coppel, and Super Farmacia, among others, which earn a percentage of the commission paid by Lucía. As in the case of remittance agents in the US, payers also benefit from reduced cash management costs and increased customer traffic in stores.[62] The latter is desirable to white goods retailers such as Elektra and Coppel.

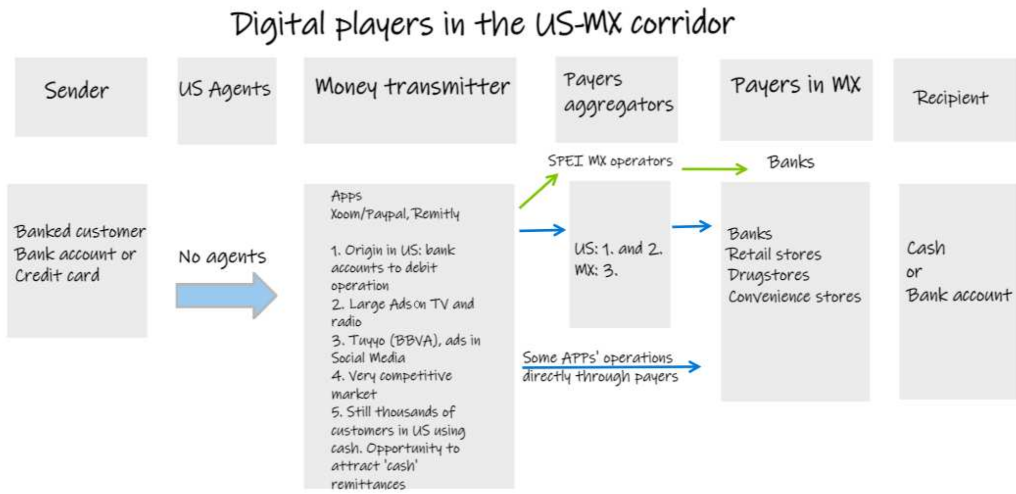
However, the availability of outlets to pay remittances is quite limited in some locations, predominantly rural. Hence, some people have to travel hours from a small town or hamlet to the municipal head. Moreover, in some areas, Telégrafos de México (the telegraph company) is the only one able to cash out remittances.

In this way, we assume that María will go to the Jaripo, Michoacan branch of Elektra to collect and cash the remittance sent by Lucía.[63]

c. Bankarised and digital transactions

An alternative to the cash transaction is where the sender and/or recipient has a bank account. See Figure 4. For instance, in our previous example, if the beneficiary, Maria, had a full-fledged bank account or at least a prepaid (N2) debit card, either would provide her with a CLABE or unique, 18-digit number for the transaction to travel directly through SPEI (i.e. Mexican real-time payment system) to her electronic wallet. These payments, if articulated through a Fintech app, can be much faster than remittances sent through remitters.[64] If the customer prefers the prepaid card option, the sender can acquire one, deposit cash in it, and then debit the remittance amount to the card. This situation must also deal with the fact that the recipient needs to collect the remittance in some way. Therefore, it becomes necessary for the Fintech firm to operate in both countries (probably through correspondent banks).

Figure 4. Competitive Structure for a Digital Remittance in the Mexico-US Corridor, 2022



Source: authors based on interviews with market participants.

The possibility of the sender having access to a bank account is less representative but it is still worth mentioning. Let's assume that this case is of a migrant woman in the United States named Consuelo, who wants to send money to her mother, Isabel. Consuelo can go to her bank branch and send the money to Mexico (bank transfer), remittance for a banked person. The bank (in the US) will contact another bank (correspondent) to pay Isabel the money in Mexico.

Consuelo could also do everything online using remitters: she could use the online services offered by Western Union or MoneyGram, fill out a form and charge the cost of the remittance to her bank account in the United States. As in the first case, the sender faces two costs commission and the fee through the exchange rate. The great advantage, in this case, is that Consuelo does everything quickly and comfortably through a computer or a smartphone, reducing transaction costs. If Isabel also has a bank account, the remittance will be deposited in the receiver's bank account. At least two banks have participated in this process, the bank in the United States and the bank in Mexico. However, it is highly likely that the bank in the United States had to use a financial intermediary to get the money to the bank in Mexico. These institutions are correspondent banks and 'payer aggregator companies', which we will discuss later.

An alternative relates to the use of a Fintech service. This alternative has two ways of operating: using a 'traditional' bank account linked to the Fintech firm by both the sender and the receiver or using prepaid cards issued by the Fintech themselves instead of ‘traditional’ banking accounts (a combination of these alternatives can also occur, but we have simplified it to two cases to illustrate this new alternative).

In this case, the situation is quite like the previous case since, in this case, there are no prepaid cards, and both parties usually have a bank account registered in the smartphone’s Fintech ‘app’ (or on the website of the Fintech firm).

The three options we have detailed here explain how the market works from the point of view of the sender and the beneficiary. However, very little is given to us about the journey that the money makes, behind the scenes, when the cash is received at an agent firm and when the transaction is computed at the ‘remitter’' company so that the money can be processed in the United States, cross the border, be processed by intermediaries, and settled by other agents, banks, 'remitters' or applications on smartphones. The next section discusses the structure of this market and the journey that a remittance takes, that is, a cross-border payment.

d. Three layers in the market structure

Behind the scenes, the market appears highly concentrated, with just a few banks involved in managing money across borders. According to one estimate, if there are approximately 25,000 banks worldwide, about 15 banks concentrate remittance volumes.[65] At this point, it is necessary to state what is developed in this section refers to sending money from the United States to Mexico, Central America, and South America because the structure is built in one direction (from the US to Mexico). Therefore, sending money from those countries to the United States is much more restricted.

We indicated above that when a remittance was sent through a ‘remitter’, such as Western Union, using bank accounts to debit and deposit the money, the process probably involved a third institution, a correspondent bank or ‘payment aggregator’ companies. Within the market, **three strata** can be identified for remittances and border payments.

The **first layer** is the simplest form. It is a direct transaction between a ‘remitter’ and a payer. In this case, MoneyGram can work directly with Oxxo and send the remittance without intermediaries. Then, of course, MoneyGram uses its bank account to liquidate dollars and purchase Mexican pesos. At the retail level there are over 100,000 remittance agents in the US while, at the same level, there is plethora of payers in Mexico: from bank branches and ATMs of BBVA Bancomer, Banorte, and Banco Azteca to some 22,000 outlets of retail shops Oxxo plus drugstores, supermarkets – such as Soriana – and others, like white good players Elektra and Coppel each having about 1,000 physical outlets throughout the country.

The **second layer** is essentially the first case, but the participation of a financial intermediary is added, for example, a correspondent bank to send the remittance. For instance, suppose a Californian worker sends a remittance through Western Union charged to their bank account at JP Morgan Bank. In this case, if we assume that Banco Santander México is a correspondent bank of JP Morgan, then the transaction occurs between both parties. The payment of the remittance is given from Western Union to JP Morgan, then to Banco Santander and finally to a payer (which could be the same bank branch or a local payer like Elektra).

The **third layer** is more common, and, in addition to the correspondent banks, the ‘payer aggregator’ companies (or ‘payment processors’) come into action. These firms are the ones that receive the mandate from a 'remitter' in the United States to send the money to the payers in Mexico. For example, one of these companies is TransNetwork which, according to its website indicates that it has more than 58,000 paying locations in nine countries.[66] A large part of its market is in Mexico, where it operates by sending money to final payers such as Oxxo, Elektra, Walmart, and Super Farmacia, among others, and correspondent banking for all Central and South America with its commercial links with BanCoppel, Banco Santander, Banco Azul (El Salvador), Bancolombia, Banco Pichincha (Ecuador), among others. Another relevant ‘payer aggregator’ company is BTS (Bancomer Transfer Services, a former subsidiary of BBVA Bancomer) and TransNetwork. Therefore, as might be inferred, correspondent banks are a key player in the market. However, at the aggregator level, BTS and TransNetwork control some 60 percent of the volume. And at a higher layer, some 15 banks control the cross-border market worldwide

As much as it might look to be as a complex market, it is not perfect. What if something goes wrong? What if the recipient does not get the remittance?

Conflict resolution. The overall and growing volume of remittances combined with the low threshold for failure by migrants suggests most transactions are completed. However, the system is not perfect either. In that case, the sender and beneficiary have to deal with at least two separate companies in two different countries. Moreover, there is no single, cross-border consumer protection body.

The most common form of conflict resolution encompasses funds returning to the sender (or the point at which the transaction was initiated). The remitter reimburses the sender the original amount in dollars. The most common source for failed transactions relates to incomplete information, such as a mismatch between the beneficiary’s name or date of birth in the transfer and the identification document (typically, beneficiaries will use the electoral card or that issued by the Instituto Nacional Electoral or INE). The sender then will resend the funds. Nonetheless, large remitters and payers have dedicated call centers to help with conflict resolution for remittances. This, of course, may become redundant to the extent that beneficiaries increasingly use N2 (prepaid) cards or become bankarized (as is the case of BBVA in Mexico which pays 85 percent of its 18 million annual remittances through N2 cards).

5. What about Fintech firms? Remittance, digital wallets and CBDC in Latin America

In 2014-2015, the Fintech revolution was well settled in Europe and North America but not yet in Latin America.[67] Several voices inside the industry started to talk about the frictions in the remittance markets and how financial technology could change it. Essentially, the diagnosis was the business was not focused on every customer’s needs[68]. The main trouble is that it was (and to some degree still is) difficult for the remitter and receiver to always know what stage their payment is at or what charges will be deducted along the way[69]. Since a big part of the market is played by correspondent banks, they need to evolve towards a 'customer-centric' model to become 'correspondent banking 3.0'[70].

As it was pointed out in the previous section, the third option considers remittances through Fintech companies. In Latin America from 2017 to date, the payments and remittances segment accounts for 25 percent (on average) of the Fintech company market, being the largest sector in the industry[71]. One technological solution to the limitations of means of payment and access to bank accounts is Fintech 'remitters' and digital wallets that allow money to be kept in the app of a Fintech firm and to operate with it later. This alternative enables users to hold different currencies in his/her wallet and then withdraw the money in the desired currency whenever users deem it appropriate. It can quickly be concluded that the Fintech alternative requires internet access, possession of computers/smartphones and knowledge related to apps, smartphones, etc. Unfortunately, most receivers (and senders) in the US-MX corridor do not usually have technology skills. Besides, if it is not through prepaid cards, the participants must still have access to the formal banking system.

It should be noted that many Fintech companies offer no fees to attract new customers, charging exclusively through the exchange rate. While this sounds very attractive and the sender may, in principle, face a lower cost, this is not guaranteed. It is perfectly possible that the price of the remittance through the exchange rate is so high that it is higher than an average market commission of 10 dollars and the exchange rate cost of a 'remitter'. Therefore, it is essential that customers identify the costs associated with sending remittances and do not end up paying more for falling within the scope of the 'no fees' offer. In addition, there are other offers from many Fintech companies looking to expand their clientele. A joint promotion is to give away a number of dollars, for example, 15 dollars, if a user recommends the Fintech service to a person who is not a client (referrals). When this new client operates with the Fintech firm, 15 dollars are charged in favor of the referring client.

In the 'traditional' remittance market, local banks, correspondent banks, 'remitters', 'payer aggregators' had to perform Anti-Money Laundry (AML), KYC, fraud checks, file regulatory reports, and compliance controls during the process. This implies several costs in each institution, different management, and sometimes different regulations because, in every single step, payments need to be confirmed and matched (so the money does not get lost along the way among millions of transactions). Fintech can help to reduce the time and monetary costs during the process. In addition, financial technology can avoid significant investments in infrastructure, reducing steps and players between local banks in both countries. For example, Finastra, a London-based Fintech company, suggests using financial technology to perform AML, KYC, match operations, and check fraud, among other things and reduce monetary and time costs. Also, this proposed the creation, through Fintech, of a large 'multinational bank' for cross-border payments that would eliminate intermediaries between local banks in both the sender and the receiver countries.[72]

When economies advance towards banking most of their population, CBDC seems to have an opportunity to improve the lives of migrant senders and their families in their home country. The

Bank for International Settlements (BIS) also suggests exploring the potential role of new payment infrastructure and arrangements. In their view,

> '*Recent advances in technology and innovation have created the potential for new payment infrastructures and arrangements that could be applied to cross-border payments. So far, these have not been implemented broadly; some are still in their design phase, and others remain theoretical. Hence their potential to enhance cross-border payments cannot yet be fully assessed. The building blocks in this focus area aim to explore the potential that new multilateral cross-border payment platforms and arrangements, central bank digital currencies (CBDCs), and so-called global 'stablecoins' could offer for enhancing cross-border payments. This focus area is more exploratory than the others and will likely be on a longer trajectory. The potential benefit of the building blocks in this focus area will be enhanced by progressing focus areas A to D (enhance cross-border payments and quality data), which, in addition to enhancing the existing payments ecosystem, will remove barriers to the emergence of new cross-border payment infrastructures and arrangements*.'[73]

In the same vein, the Federal Reserve (2022) recently published a report on how the exchange framework developed by the Business Payments Coalition (BPC) for electronic invoice (e-invoice) can be quickly and easily adapted for the remittances business using the momentum generated by the industry.[74]

Remittances show a growing trend. Even if we consider that migration flow from Mexico to the United States has a limit in the next decades,[75] remote work and internet coverage will increase in the future. Therefore, remittances might continue to increase. In addition, there is a current unbanked Mexican population living in the US that are not enjoying the benefits from technology changes in payments. Several estimations claim that half of the adult population in Latin America does not have a banking account. It gives enough space to the banking sector and the public sector to serve this population through financial services and digital currency.[76]

One of the benefits of CBDC is the reduction of costs of 'issuing' bills. Today in 2022, most of the remittances are made in cash from the United States and paid in cash in Mexico. Digital currencies have an opportunity to slash issuing (bills) costs for both United States and Mexico but also to reduce transaction costs for final users (i.e., sender and receiver) by disintermediating the current market structure, especially the few banks that concentrated most of the remittances 'behind the scenes'. This is relevant because the main beneficiaries from remittances are low-income economies, where every penny counts. The Financial Times stated correctly 'The UN's 2030 sustainable development goals aim to reduce the cost (of cross-border payments) to 3 per cent, but this should be accelerated. Increased competition and new technologies can help. Since remittances now play such a key role in low-income countries, it is important to ensure that not too much ends up in the hands of intermediaries'.[77]

However, if Fintech firms and CBDC want to have a chance in the remittance US-MX corridor, they must deal with the large number of unbanked Mexicans in the United States. Fintech firms essentially work with banked customers who trust in banks on both sides of the border, but this is only a small share of the market. On the other hand, a socially beneficial CBDC for remittances demands banked and digitalized individuals operating in the remittances market. The reality is far from there. In addition, Fintech must solve the resilience of cash as the king of small payments in Mexico and the issues related to privacy and trust, customers' loyalty[78], reliability of institutions, and complaints on financial services. The solution to these problems should be 'good enough' to overtake the rooted traditional and informal financial services through relatives and friends.

About the authors

Bernardo Bátiz-Lazo (PhD, FHEA, FRHistS, FAcSS) is Professor of Fintech History and Global Trade at the Newcastle Business School, Northumbria University (UK) and Research Professor at the Faculty of Economics and Business, Universidad Anáhuac (Mexico). He has published more than 45 articles in internationally peer-reviewed journals and five academic books (Palgrave Macmillan, Routledge, Oxford University Press). Bernardo has combined full-time appointments with consulting and executive training in Europe, the Gulf States, Latin America, and Asia. Since 1999 he has been the curator of a weekly report (nep-his) on new working papers in business, economic, and financial history. The blog with this report was launched in 2010 and has been referenced in the *Wall Street Journal*, *Financial Times*, and *The Economist*. His research papers on ATMs have been published or cited in The Conversation, Bloomberg, Smithsonian Magazine, Fortune, The Atlantic, and Wired. Email: bbatiz64@gmail.com

Ignacio González-Correa is a Graduate Student at the Department of Economics, University of California, Davis. He holds a Bachelor's degree in economics and a Master's degree in Economic History (Universidad de Santiago, Chile) with experience in both professional and academic banking. He worked in the headquarters at *BancoEstado*, the largest commercial bank in Chile. Ignacio oversaw commercial initiatives related to financial products including money exchange and international payments orders. As an independent consultant, he has co-worked with Bernardo Bátiz-Lazo in business advisory in Fintech and remittances for Latin American banking institutions. His academic research has been focused on state-owned banks and Fintech companies in Latin America. His articles have been published in the *Journal of Iberian and Latin American Economic History*, *Journal of Evolutionary Studies in Business, Historia Agraria*, *Papeles de Economía Española*, among others. Email: igonz@ucdavis.edu

Notes

[1] We thank anonymous industry participants for their time, insights and comments.

[2] Aguilar Ortega, T. (2021). 'Macroeconomía y remesas' In T. Agilar Ortega and R Domínguez Guadarrama (eds.) Polìtica migratoria, redes y remesas. Un análisis desde México. Ciudad de México: Universidad Nacional Autónoma de México, pp. 131-157. (p. 132).

[3] Here we are following the definition by Heath (2012). Lo que indican los indicadores: Cómo utilizar la información estadística para entender la realidad económica de México. Mexico: Instituto Nacional de Estadísticas y Geografía. p. 194.

[4] The Financial Times (2019a). 'Record high remittances are not without risks. The Editorial Board. September 2, 2019.' https://www.ft.com/content/1538de3c-c99c-11e9-a1f4-3669401ba76f

[5] The Financial Times (2019a). 'Record high remittances are not without risks. The Editorial Board. September 2, 2019.' https://www.ft.com/content/1538de3c-c99c-11e9-a1f4-3669401ba76f

[6] The Financial Times (2019b). 'Remittances: the hidden engine of globalisation.' By Cocco, F., Wheatley, J., Pong, J., Blood, D. and Rinisland, A. FT Series Cash Trails. August 28, 2019. https://ig.ft.com/remittances-capital-flow-emerging-markets/

[7] United Nations (2018). 'Remittances – an untapped engine for sustainable development.' Kuala Lumpur, Department of Economic and Social Affairs. May 8, 2018. https://www.un.org/development/desa/en/news/population/remittances-engine-for-sustdev.html; The Financial Times (2019a). 'Record high remittances are not without risks.' The Editorial Board. September 2, 2019. https://www.ft.com/content/1538de3c-c99c-11e9-a1f4-3669401ba76f; Future of Finance (2021). 'It's time to fix cross-border payments.' Future of Finance Seminar. September 18, 2021. https://futureoffinance.biz/2021/09/28/its-time-to-fix-cross-border-payments/.

[8] Giuliano, P. and Ruiz-Arranz, M. (2009). 'Remittances, financial development, and growth.' *Journal of Economics Development* 90, pp. 144-152.

[9] Padilla Pérez, R., Stezano, F. and Villarreal, F. G. (2020). 'Fomento de la inversión de las remesas familiares en cadenas de valor: estudios de casos de El Salvador, Guatemala y la República Dominicana'. Documentos de Proyectos (LC/TS.2020/102; LC/MEX/TS.2020/26). Ciudad de México, Comisión Económica para América Latina y el Caribe (CEPAL-ECLAC); Woodruff, C. and Zenteno, R. (2001). 'Remittances and Microenterprises in Mexico.' UCSD, Graduate School of International Relations and Pacific Studies Working Paper. August 14, 2001. Available at SSRN: https://ssrn.com/abstract=282019 or http://dx.doi.org/10.2139/ssrn.282019

[10] Cervantes, J. and Cruz, G. (2021). 'Las remesas y la medición de la pobreza en los estados mexicanos'. Foro Remesas América Latina y el Caribe. Notas de Remesas. September 2021. Centro de Estudios Monetarios Latinoamericanos (CEMLA). https://www.cemla.org/fororemesas/notas/2021-08-notasderemesas-09.pdf

[11] The World Bank (2021). 'Defying Predictions, Remittance Flows Remain Strong During COVID-19 Crisis.' Press Release. May 12, 2021. https://www.worldbank.org/en/news/press-release/2021/05/12/defying-predictions-remittance-flows-remain-strong-during-covid-19-crisis

[12] BBVA Research, Fundación BBVA and Consejo Nacional de Población (CONAPO) (2021). *Anuario de Migración y Remesas México 2021* (Spanish/English version). By Juan José Li, Guillermo Cárdenas, Luis Antonio Espinosa and Carlos Serrano. July 14, 2021. https://www.bbvaresearch.com/publicaciones/anuario-de-migracion-y-remesas-mexico-2021/

[13] Unless otherwise stated this paragraph borrows freely from Heath (2012), p. 205.

[14] BBVA Research, Fundación BBVA and Consejo Nacional de Población (CONAPO) (2021). *Anuario de Migración y Remesas México 2021* (Spanish/English version). By Juan José Li, Guillermo Cárdenas, Luis Antonio Espinosa and Carlos Serrano. July 14, 2021

[15] BBVA Research, Fundación BBVA and Consejo Nacional de Población (CONAPO) (2021). *Anuario de Migración y Remesas México 2021* (Spanish/English version). By Juan José Li, Guillermo Cárdenas, Luis Antonio Espinosa and Carlos Serrano. July 14, 2021.

[16] KNOMAD/World Bank (2022). Remittances data. Available at: https://www.knomad.org/data/remittances

[17] The Financial Times (2020). 'Mexican migrants send more money home to help the virus-hit economy.' August 4, 2020. https://www.ft.com/content/424e695e-fc39-4024-9952-578d39655ab6; The New York Times (2020). 'Even When They Lost Their Jobs, Immigrants Sent Money Home.' September 24, 2020. https://www.nytimes.com/2020/09/24/us/coronavirus-immigrants-remittances.html

[18] BBVA Research (2022). 'México. Remesas suman 21 meses al alza, aumentaron 19.6 por ciento en enero.' By Juan José Li. Migración y Remesas. March 1, 2022. https://www.bbvaresearch.com/publicaciones/mexico-remesas-suman-21-meses-al-alza-aumentaron-196-en-enero/

[19] Cruz Vargas, J. C. (2002) 'Remesas acumulan 24 meses consecutivos al alza: Banxico', *Proceso*, https://www.proceso.com.mx/economia/2022/6/1/remesas-acumulan-24-meses-consecutivos-al-alza-banxico-286912.html

[20] Here we are following the definition by Heath (2012), p. 194.

[21] Roldán, G., Gasca, J. and Sánchez, C. (coordinators) (2019). La travesía de las remesas y la senda de la migración indígena en México. Instituto de Investigaciones Económicas. Mexico: PUIC, DGAPA, UNAM.

[22] Mexico Institute and Wilson Center (2022). 'Remittances in Mexico Reach a Historic High.' Infographic by Jazmin Aguilar Rangel. March 15, 2022. Available at: https://www.wilsoncenter.org/article/infographic-remittances-mexico-reach-historic-high

[23] Roldan et al. (2019) estimates that 90 percent of the transfers by indigenous groups comprise nàhuas, purèpechas, mixtecos, totonacas, and nhañus.

[24] Schatan, C. (2022). 'Las migajas externas y las migajas internas´. *Voces* (16/06/2022). https://vocesmexico.com/opinion/las-migajas-externas-y-las-migajas-internas/

[25] In Mexico, 99.7 percent of all firms are small or micro enterprises (mypymes). The other 3 percent is made of some 14,000 large employers. Trejo Veytia. G. (2022). Veda regulatoria. *El Universal* 26/05/2022 https://www.eluniversal.com.mx/opinion/gerardo-trejo-veytia/veda-regulatoria (accessed 14/06/2022).

[26] Schatan, C. (2022). 'Las migajas externas y las migajas internas´. *Voces* (16/06/2022). https://vocesmexico.com/opinion/las-migajas-externas-y-las-migajas-internas/

[27] Lim, S. and Khun, C. (2022). 'Macroeconomic impacts of remittances: A two-country, two-sector model'. *Journal of Macroeconomics*, 73: 103443.

[28] Presburger Cherem, E. (2021). Remesas: economia, demografia y politica. Ciudad de México: Instituto Mexicano de Contadores Públicos.

[29] Bátiz-Lazo, B. (2021). Jesús Cervantes: Las remesas en México. *Trade Zombies,* episode 6 (10/13/2021). https://tradezombies.podbean.com/e/tz006-jesus-cervantes-las-remesas-en-mexico/.

[30] We appreciate comments from David Escamilla pointing us in this direction.

[31] Basok, T. (2000a). 'He came, he saw, he.. stayed. Guest worker programmes and the issue of non-return'. *International Migration* , 38(2): 215-238. Basok, T. (2000b). 'Migration of Mexican seasonal farm workers to Canada and development: obstacles and productive investment'. *IMR* 34(1): 79-97.

[32] López Castro, G. (1986). *La casa dividida: un studio de caso sobre la migración a Estados Unidos en un pueblo michoacano.* Zamora, Mich: El Colegio de Michoácan.

[33] Durand, J. and Massey, D. S. (1992). 'Mexican migration to the United States: A critical review'. *Latin American Research Review*, 27(2): 3-42.

[34] Amuedo-Dorantes, C. and Pozo, S. (2006). 'Remittances as insurance: Evidence from Mexican migrants'. *Journal of Population Economics*, 19(2): 227-254.

[35] Lipton, M. (1980). 'Migration from rural areas of poor countries'. *World Development*, 8: 1-24.

[36] Garip, F. (2012). 'Discovering diverse mechanism of migration: The Mexico-US stream 1970-2000'. *Population Development Review* 38(3): 393-433.

[37] Gibson, J.; McKenzie, D. and Stillman, S. (2011) 'The impacts of international migration of remaining household members'. *The Review of Economics and Statistics*93(4): 1297-1318.

[38] McKenzie, D. and Rapoport, H. (2011). 'Can migration reduce educational attainment?'. *Journal of Population Economics*, 24:1331-1358.

[39] Tyburski, M. D. (2014) 'Course or cure? Migrant remittances and corruption'. *The Journal of Politics* 76(3):814-824.

[40] Ahmed, F. Z. (2013). 'Remittances deteriorate governance'. *The Review of Economics and Statistics*, 95(4): 1166-1182.

[41] Escamilla-Guerrero, D. (2019). Cliometric Essays on Mexican Migration to the United States. Unpublished PhD Dissertation. Department of Economic History. London: London School of Economics and Política Science (University of London), p. 18. See also Escamilla-Guerrero, D. (2020). Revisiting Mexican migration in the Age of Mass Migration: New evidence from individual border crossings. *Historical Methods*, vol 53 (4): 207-225.

[42] An executive order called the 'Mexican Farm Labor Program' of 1942 resulted from diplomatic accords between Mexico and the United States to permit millions of Mexican men to work legally in the United States on short-term labor contracts. It also related to Great Depression era deportations and repatriations that unjustly targeted Mexican Americans who were U.S. citizens. 1942: Bracero Program', Library of Congress, https://guides.loc.gov/latinx-civil-rights/bracero-program (accessed 0671172022).

[43] Aguilar Ortega, T. (2021), p. 131.

[44] Aguilar Ortega (2021), pp. 139 and 140.

[45] Aguilar Ortega (2021), p. 136. Mexican origin encompasses those whose at least one parent born in Mexico.

[46] The Economist (2022). 'The United States of Mexico. Mexican migration has changed America for the better.' The Americas, pp. 27-28. April 23-29, 2022. https://www.economist.com/the-americas/2022/04/23/mexican-migration-has-changed-america-for-the-better

[47] Aguilar Ortega, T. (2021). 'Macroeconomía y remesas' In T. Agilar Ortega and R Domínguez Guadarrama (eds.) Polìtica migratoria, redes y remesas. Un análisis desde México. Ciudad de México: Universidad Nacional Autónoma de México, pp. 131-157. (p. 132).
[48] Escamilla-Guerrero (2019), p. 26.

[49] Gamio, M. (1930). *Mexican immigration to the United States*. Chicago, IL: University of Chicago Press.

[50] BBVA exit is partly due to the sale of BBVA Compass and other US assets to PNB in 2020. However, distribution in Mexico through prepaid debit cards remains high.

[51] Banco Azteca claims to have the largest 'bricks and mortar' distribution network in the country with 1,800 retail bank branches. They also claim to have presence in more than 800 municipalities, and in almost 200 of them, being the only bank. https://www.bancoazteca.com.mx/conocenos/sobre-banco-azteca.html (accessed 09/06/2022).

[52] Nogues, R. 'Oxxo se estrena como Fintech: lanza app para enviar y recibir dinero', *Forbes (Mexico)*, December 28, 2021. https://www.forbes.com.mx/negocios-oxxo-Fintech-app-enviar-recibir-dinero/

[53] Nogues, R. 'Ventas de FEMSA crecen 18.6 percent; Fintech de Oxxo logra 2 millones de clientes', *Forbes (Mexico)*, May 2, 2022. https://www.forbes.com.mx/ventas-de-femsa-crecen-18-6-Fintech-de-oxxo-logra-2-millones-de-clientes/

[54] 'Cash still drives 90 percent of transactions under 500 Mexican pesos (25 dollars), as well as 78.7 percent of payments or bills over 500 pesos… The proportion of Mexican adults with bank accounts edged up two percentage points between 2018 and 2021 to 49.1 percent, while card usage for larger transactions increased to a modest 12.3 percent.' Reuters (2022). Fintechs fail to make a dent in Mexico as cash remains king. Future of Money. By Isabel Woodford. May 26, 2022. Available at: https://www.reuters.com/business/finance/fintechs-fail-make-dent-mexico-cash-remains-king-2022-05-26/

[55] This could be explained by several factors such as lack of specialized products for this public or the resilience of the use of cash. For a discussion of this latter aspect, review the preference on cash over debit cards in van der Cruijsen, C., Hernandez, L. and Jonker, N. (2017). 'In love with the debit card but still married to cash.' *Applied Economics* 49 (30), pp. 2989-3004, and the persistence of cash during the COVID-19 pandemic in Bátiz-Lazo, B., González-Bautista, M. and González-Correa, I. (2021). 'La transformación en el uso de efectivo y pagos digitales durante la pandemia de la COVID-19'. *Papeles de Economía Española* 170, pp. 125-142. Also, see World Bank GlobalFindex Report https://globalfindex.worldbank.org/ (accessed 06/09/2022).

[56] There is also the case where the sender does not have a peer recommendation and goes to the store and requests the different types of exchange offered by the 'remitters' and chooses the cheapest one. For the administration of the store, it is indifferent with which 'remitter' the customer operates since the commission is similar among 'remitters'.

[57] On the extent to which small shops deviate from strict agent behavior to increase customer loyalty see Espinosa-Cistia, J. F; Alarcón, J. I. and Bátiz-Lazo, B. (2022) 'Local Adaptation of Work Practices: The Case of BancoEstado's 'CajaVecina' Correspondent Banking System', *Sage Open*, https://journals.sagepub.com/doi/full/10.1177/21582440221089974.

[58] According to the IMF, World Bank, and Koncept Analytics cited by The Financial Times, the average cost of sending money across international borders is 7 percent. The Financial Times (2019c). 'A Radical plan to slash cross-border payments costs…with subscription fees.' By Jemima Kelly. October 7, 2019. https://www.ft.com/content/1ac5ebc3-b3a9-308d-b85e-2f1d7d11811e

[59] If the 'remitter' firms fail in their estimates and are left long/short, the 'payer aggregators' could cover that difference.

[60] As of December 2019, Mexico reported approximately 58 thousand automated teller machines (ATMs) operating around the country. Multipurpose banks concentrated nearly 98 percent of the ATMs, with approximately 56.620 devices. That same year, BBVA Bancomer was the bank with the highest number of ATMs in the country (https://www.statista.com/statistics/1192806/number-atm-institution-mexico/ and https://www.statista.com/statistics/1114473/mexico-number-atm-banks/).

[61] According to the Global Findex of the World Bank (2017), cited by IDB et al. (2022: 89), there are 304 million women without access to banking accounts in Latin America.

[62] At this point it is worth noting that both Elektra and Coppel were retail companies that sold appliances and goods but then they opened banking-related firms (Banco Azteca and BanCoppel, respectively) that deal with remittances and financial services.

[63] In Mexico, Elektra is recognized as a well-known popular place to pick up remittances from the United States. See The San Diego Union-Tribune (2021). 'Remittances have increased sharply since the start of the pandemic, with help from U.S. relief payments.' By Wendy Fry. March 10, 2021.

[64] Normally, the first time a client uses a Fintech, they must pass a personal and banking data authentication process. On that occasion the remittance can take 48 or 72 hours. After that, if everything is in order, remittances are usually more expeditious and available in one business day.

[65] Future of Finance (2021). 'It's time to fix cross-border payments. Future of Finance Seminar.' September 18, 2021.

[66] https://transnetwork.com/TransnetworkSite/collection_points.aspx

[67] Bátiz-Lazo, B. and González-Correa, I. (2022). 'Start-ups, Gender Disparities, and the Fintech Revolution in Latin America'. In Montiel, O. and Almaraz, A. (eds.) The Emerald Handbook of Entrepreneurship in Latin America: Unleashing a millennial potential. Vol. II, Innovation and Entrepreneurship. Emerald Publishing, UK, pp. 221-242.

[68] Barry, C. and Zaccardi, P. (2015). 'Cross-border payments: challenges and trends'. Voice of The Industry. The Payers. March 5, 2015. https://thepaypers.com/expert-opinion/cross-border-payments-challenges-and-trends--758933

[69] The Global Treasurer (2014). 'Correspondent Banking: Still Here, Still Relevant for Corporates.' September 8, 2014. https://www.theglobaltreasurer.com/2014/09/08/correspondent-banking-still-here-still-relevant-for-corporates/

[70] Casu, B. and Wandhöfer, R. (2018). 'The Future of Correspondent Banking Cross Border Payments'. October 5, 2018. SWIFT Institute Working Paper No. 2017-001, Available at SSRN: https://ssrn.com/abstract=3261168

[71] IDB (Inter-American Development Bank), IDB Invest, and Finnovista (2022). *Fintech en América Latina y el Caribe. Un ecosistema consolidado para la recuperación*. Washington, DC; and IDB, IDB Invest and Finnovista (2018). *Report on Fintech in Latin America 2018: Growth and Consolidation*. Washington, DC.

[72] Finastra (2021). 'Cross-border payments made simple.' YouTube video. May 27, 2021. https://www.youtube.com/watch?v=khbGD4QTuCs

[73] BIS (2020). 'Enhancing cross-border payments: building blocks of a global roadmap'. Stage 2 report to the G20. Committee on Payments and Market Infrastructure. Bank for International Settlements. July 2020. https://www.bis.org/cpmi/publ/d193.pdf

[74] The Federal Reserve (2022). 'Remittance Delivery Assessment Report'. The Federal Reserve, FedPayments Improvement, Business Payments Coalition. June 2022. https://businesspaymentscoalition.org/wp-content/uploads/remittance-delivery-assessment-report.pdf

[75] Heath, J. (2012). Lo que indican los indicadores: Cómo utilizar la información estadística para entender la realidad económica de México. Mexico: Instituto Nacional de Estadísticas y Geografía. p. 194.

[76] Interview participants do not think of cryptocurrencies such as Bitcoin as a replacement for cash or CBDC. Remittances are too vital for family economies in Mexico so Mexicans would not prefer a volatile currency that could collapse part of their monthly income used for food, housing, dressing, and health care.

[77] The Financial Times (2019a). 'Record high remittances are not without risks.' The Editorial Board. September 2, 2019. https://www.ft.com/content/1538de3c-c99c-11e9-a1f4-3669401ba76f

[78] Interview participants suggested that remittance payments are used as part of a retail strategy to increase foot traffic (and thus sales) in retail stores. As has been documented by Espinosa-Cristia, Alarcón and Bátiz-Lazo (2022) and Ossandón (2014; 2017), there are opportunities for agents to use their contact with clients to increase loyalty of repeat customers. It is unclear whether this is also the case of remittance agents such as Oxxo. See Espinosa-Cristia, J. F., Alarcón, J.I., and Bátiz-Lazo, B. (2022). 'Local Adaptation of Work Practices: The Case of BancoEstado's 'CajaVecina' Correspondent Banking System'. SAGE Open, April-June 2022, 1-14; Ossandón, J. (2014). 'Sowing consumers in the garden of mass retailing in Chile.' Consumption Markets & Culture, 17(5), 429–447; and Ossandón, J. (2017). 'My story has no strings attached': Creditcards, market devices and a stone guest.' In McFall, L. Cochoy, F., and Deville, J. (Eds.), *Markets and the arts of attachment*. Routledge, pp. 142-156.