Remittances to Mexico. Macroeconomic and microeconomic uses

Remesas en México. Valoración macroeconómica y microeconómica

Víctor Isidro Luna
Consejo Nacional de Población, México
Rafael López Vega
Consejo Nacional de Población, México

Correspondencia: victor.isidro@utah.edu, rlopezv@conapo.gob.mx

ABSTRACT. This article discusses the macroeconomic and microeconomic characteristics of Mexican remittances from 2003 to the present day. To study the macroeconomic relevance of remittances, we use the Bank of Mexico (Banxico) balance of payments from a heterodox viewpoint, and to study microeconomic relevance, we rely on the survey of international migration at the north border (EMIF Norte) regarding the flow of inland migrants coming from the United States (Procedentes de Estados Unidos-Terrestres, PEUAT). Macroeconomically, remittances are a stable flow of foreign change. They have blocked the existence of an unsustainable current account deficit and prevented crises and exchange rate depreciations. Microeconomically, remittances are national purchasing power, and they serve to increase private consumption in very important areas such as food and clothing, and health care and to reflect demographic characteristics of the remittances' senders, such as the type of migrant who sends remittances (resident or nonresident), the sex of the migrant, and the main factors that drive remittances sent by Mexican people who are residents on US soil. This article does not fully show interconnections between the macroeconomic and microeconomics uses of remittances, nor does it stress the discrepancy between the balance of payments and national surveys in accounting for familiar remittances. Rather, we underline that a combination of sources such as the national accounts and national surveys must be carried out to understand the effects of remittances from macroeconomic and microeconomic viewpoints.
Keywords: current account, migration, remittances.

RESUMEN. Se estudia la importancia de las remesas a un nivel macroeconómico y microeconómico de 2003 a la actualidad. Para estudiar la relevancia macroeconómica se utiliza la balanza de pagos del Banco de México (Banxico) desde un enfoque económico heterodoxo, y para estudiar la relevancia microeconómica se usa la encuesta de migración internacional en la frontera norte (EMIF Norte) respecto al flujo de migrantes terrestres provenientes de Estados Unidos (Procedentes de Estados Unidos-Terrestres, PEUAT). Macroeconómicamente, las remesas son un flujo estable de divisas que reducen el déficit en cuenta corriente, evitan crisis y depreciaciones del tipo de cambio. Microeconómicamente, las remesas son poder de compra doméstico y sirven para aumentar el consumo privado en áreas muy importantes como alimentos y vestido, y salud y también sirven para reflejar las características demográficas de la población que envía remesas como lo son el tipo de migrante que envía las remesas (residente o no residente), el sexo del migrante y los principales factores que impulsan las remesas enviadas por mexicanos residentes en suelo estadounidense. Este artículo no muestra en detalle las interconexiones entre los usos macroeconómicos y microeconómicos de las remesas, ni enfatiza la discrepancia entre el volumen de remesas de la balanza de pagos y el de las encuestas. Se subraya en que un análisis de las remesas debe combinar fuentes de información como las cuentas nacionales y también las encuestas nacionales para comprender los efectos de las remesas desde los puntos de vista macroeconómico y microeconómico.
Palabras clave: cuenta corriente, migración, remesas.

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1. Introduction.

Mexico has surpassed China in receiving remittances, and currently is second after India in receipt of remittances, with an amount of 51,586 millions of dollars in 2021. Mexican remittances have been increasing, especially since 2000, and in the last five years (2016-2021), the average of the remittances has been 2.66 percent of the gross domestic product (GDP), 7.08 percent of exports, and 2.74 percent of the gross national income (GNI). Furthermore, the relevance of remittances can be viewed not only macroeconomically but also microeconomically. International organizations such as the Comisión Económica para América Latina y el Caribe, CEPAL (2019a) have reported that in 2016, households in Mexico receiving remittances had nearly 15 percent less incidence of poverty than households that were not receiving remittances.

Therefore, remittances provide households national purchasing power, and households can spend their money on food and clothing and health care (CONAPO, 2019; CONAPO et al., several years), thereby reducing poverty and inequality. This article shows the macroeconomic and microeconomic uses of Mexican remittances from 2003 to the present day. Macroeconomically, remittances are foreign exchange, and they serve to close the Mexican current account deficit and to prevent crises and exchange rate depreciation. Microeconomically, remittances are national purchasing power, and they serve to increase private consumption in very important areas such as food and clothing and health care and to reflect demographic characteristics of the remittances' senders.

To study the macroeconomic relevance of remittances, we use the Bank of Mexico (Banxico) balance of payments, and to study the microeconomic relevance, we rely on the survey of international migration in the north border (EMIF Norte) regarding the flow of inland migrants coming from the United States (Procedentes de Estados Unidos-Terrestres (PEUAT)). [1] Unlike other studies that have shown the discrepancy between the balance of payments and national surveys in accounting for familiar remittances (Lozano, 2004; Tuirán, Santibánez y Corona, 2006; Canales, 2008; Fuentes y González, 2012), this article shows that different sources provide particularly valuable information.

In this sense, this study follows the CEPAL (2019a; see also Brown et al., 2014), which underlines that a combination of sources such as the national accounts and national surveys must be carried out to understand the effects of remittances on population. Then, macroeconomically, remittances are foreign exchange: they serve in many countries-- including Mexico-- to improve the current account balance, and they provide international purchasing power (Meyer and Shela, 2015). In contrast, microeconomically, remittances are familiar purchasing power, and national surveys such as the survey of international migration in the north border can serve to identify demographic characteristics of the remittance senders.

After this introduction, this article proceeds as follows: Section 2 describes the methodology. Section 3 presents the results, first it notes Mexican external restrictions on the balance of payments and highlights the contribution of the remittances in providing foreign exchange and in avoiding unsurmountable current account deficits; it analyzes the evolution of remittances among residents and nonresidents according to the EMIF Norte, the characteristics of the remittance senders by sex and age, and particularly resident remittances in terms of the number of migrants, average remittance, and the number of average transactions of remittances per year. Section 5 outlines concluding remarks.

[1] Unfortunately, EMIF can be utilized only until 2019 because no survey was conducted during the pandemic years and afterwards there have been financing problems.

2. Methodology.

Migration and remittances are complex phenomena because they can be studied from macroeconomic and microeconomic viewpoints, and both viewpoints can be intermingled. In a macroeconomic sense, this article follows a heterodox approach of an external restriction in a peripheral economy such that of as Mexico. For technological backwardness and financial dependence, Mexico has a trade deficit[2] and investment income balance deficit.[3] As a result, Mexico needs foreign exchange to finance its development and to prevent crises and exchange rate depreciation (and a possible rise in inflation, income distribution problems, and the increase of debt and its service) (Grasso, Malic, and Ziccarelli, 2017; Martínez-Hernández, 2017; Verengo and Caldentey, 2020). Remittances are a source of external revenue, defined by the International Monetary Fund (IMF) as follows:

Total remittances are the sum of personal remittances and social benefits. Social benefits include "benefits payable under social security funds and pension funds. They may be in cash or in kind". Total remittances include income from individuals working abroad for short periods, from individuals residing abroad and sending transfers, and social benefits from abroad (IMF, 2009:274).

Total remittances consist of the sum of personal transfers, compensation to employees, and capital transfers between households. They can be sent by residents or nonresidents, and they provide a source of foreign exchange as well as international purchasing power to the recipient country. As the entries of short-term capital and long-term capital have not been stable in Mexico, remittances since the 1990s have been a permanent and growing source of foreign exchange.

From a microeconomic point view, the analysis of remittances has different levels related to the complex phenomenon of international migration flows. For example, the individual decision to migrate is not only related to the individual but also to the household, family, or the community. Furthermore, migrants frequently establish permanent ties in their home region regardless of the amount of time spent away in the foreign country. Then, the decisions to send remittances is not personal; it is embedded in social relations. Having mentioned the complexity of the remittances and migration phenomenon, this article carries out a demographic analysis of migrants who have worked in the United States and have sent money to Mexico (Procedentes de Estados Unidos – Terrestres, PEUAT) using the survey of international migration on the northern border (EMIF Norte).

The EMIF Norte is a two-step survey carried out on the northern border that aims to determine characteristics of the populations in movement. Using this flow, we analyze the following: (1) the amount and the trends of resident and nonresident remittances, (2) the association between the type of migrant (resident or nonresident) and the likelihood of sending remittances, (3) the remittance senders by sex and age in the resident and nonresident migrant populations, and (4) the analysis of resident remittance by the number of migrants, average transaction, and average remittance. Remittances are computed as events in which money is transferred to Mexico in the last 12 months divided by two types of flows: resident and nonresident. Residents are identified as having a green card (Permanent Residency Card) or a residency id (ID), or who are U.S. citizens; in contrast, nonresidents hold other types of visas. In the case of residents, and in line with Canales (2008), remittances are calculated by this formula: TR=NR*AR*NTSR.

TR is the total amount of remittance of the residents, NR indicates the number of remittance events by migrants who have worked in the United States and sent remittances to Mexico, AR is the

[2] Net balance of goods and services.
[3] Net balance of income minus compensation to employees.

weighted average remittance in the last 12 months, and NTSR is the weighted average transaction in sending remittances in the last 12 months. From 2003 to 2009, the computation of the AR and NTSR was slightly modified since the questions were not the same as in the questionnaires of the 2010-2019 period. Thus, in the 2003-2009 period, AR is the weighted average remittance in the last month, and NTSR is the weighted average transactions of sending remittances during the total years of migrants' stay in the United States divided by the weighted average total number of years of migrants' stay in the United States.

In the case of nonresidents, and following the IMF (2009: 272), which states that nonresident remittances can be approximated by the concept of compensation to employees, remittances are computed by total income per year in the workplace by the nonresidents who also send remittances. The IMF notes that, "Compensation of employees refers to the income of border, seasonal, and other short-term workers who are employed in an economy where they are not resident and of residents employed by nonresident entities (2009: 272). The obtained results are compared versus the evolution of the time series of the Bank of Mexico (BANXICO) and of the Bureau of Economic Analysis of the United States (BEA) in the 2003-2019 period.

The association between the type of migrants (resident or nonresident) and the likelihood of sending remittances is calculated by testing the hypotheses regarding two categorical variables using chi-square. The null hypothesis is that there is not any relationship between the type of migrant and the sending of remittances; in contrast, the alternative hypothesis states that the sending of remittances varies with the type of migrant. Whereas the sex of the resident and nonresident remittance senders is computed simply by the number of events of remittances senders, the average age is calculated as the average weighted mean of each group (resident or nonresident migrant by sex). Finally, the main components of the resident remittance (number of migrants, average transaction, and average remittance) were analyzed by taking the rate of growth of the total remittance of this flow and each one of its components.

3. Results.

3.1. Macroeconomic point of view.

Mexico must attract foreign exchange because of its trade balance and investment income balance deficits. This Mexican weakness is historically rooted in an institutional and technological backwardness and in financial dependence on international capital flows. Since the end of the 1940s, Mexico's trade balance deficit has had to be covered by financial flows in order to avoid a crisis and exchange rate depreciation. In the late 1940s, Mexico underwent a devaluation (Cárdenas, 2015) for a return of capital to the home countries after the uncertainty of World War II. In some specific situations, as during the "stabilizing development" (1958-1970), devaluation was delayed by attracting short-term capital using a high interest rate (Reynolds, 1977; Isidro Luna, 2017). Unfortunately, this delay in exchange devaluation resulted in instability in the Mexican economy and a massive process of indebtedness during the 1970s (Quijano, 1981).

The investment income balance deteriorated at a rate of 30.5 percent in the 1970-1980 period. Mexico's low international competitiveness during the 1970s (the export coefficient was 5.1 percent, and the import coefficient was 7.6 percent in the 1970-1980 period) and the U.S. increase of the interest rate in 1979 led to Mexico's inability to pay the debt service in 1982. Subsequently, the Mexican debt crisis produced nearly 0 economic growth, inflation, and social conflicts during the 1980s. To pay the debt service, Mexico implemented several policies through the 1980s and the early 1990s, such as exchange

rate depreciation, the selling of state-owned companies, and wage reductions (to gain competitiveness) (Valenzuela, 1986; Aspe Armella, 1993; Guillén Romo, 1994).

Despite Mexico's transfers of massive amounts of capital abroad during the 1980s, the country still has a problem with increasing its financing in order to promote development and to renew its social and productive infrastructure. Figure 1 plots the trade balance and the investment income balance of the balance payments. The trade balance shows a technological backwardness and Mexico's production dependency on imports, and the investment income balance displays the heavy burden in payments on debt interest, and foreign company transfers of utilities and dividends to their home countries. The trade balance has a negative linear trend, and it has only been positive during times of crisis: the lost decade (1980s), in 1995, and in 2020.

Mexico has had a positive trade balance in times of crisis because it has a smaller economy and by consequence is a poorer country. If the Mexican economy expands, the trade deficit would increase, as has happened previously. Similarly, the investment income balance has a negative linear trend. It improved through the end of the 1990s and the beginnings of the 2000s; however, it started to deteriorate after 2005, and worsened drastically following 2010. As long as Mexico has external restrictions, the country is constrained to apply expansionary policies of growth and development (Sidaoui et al, 2011).

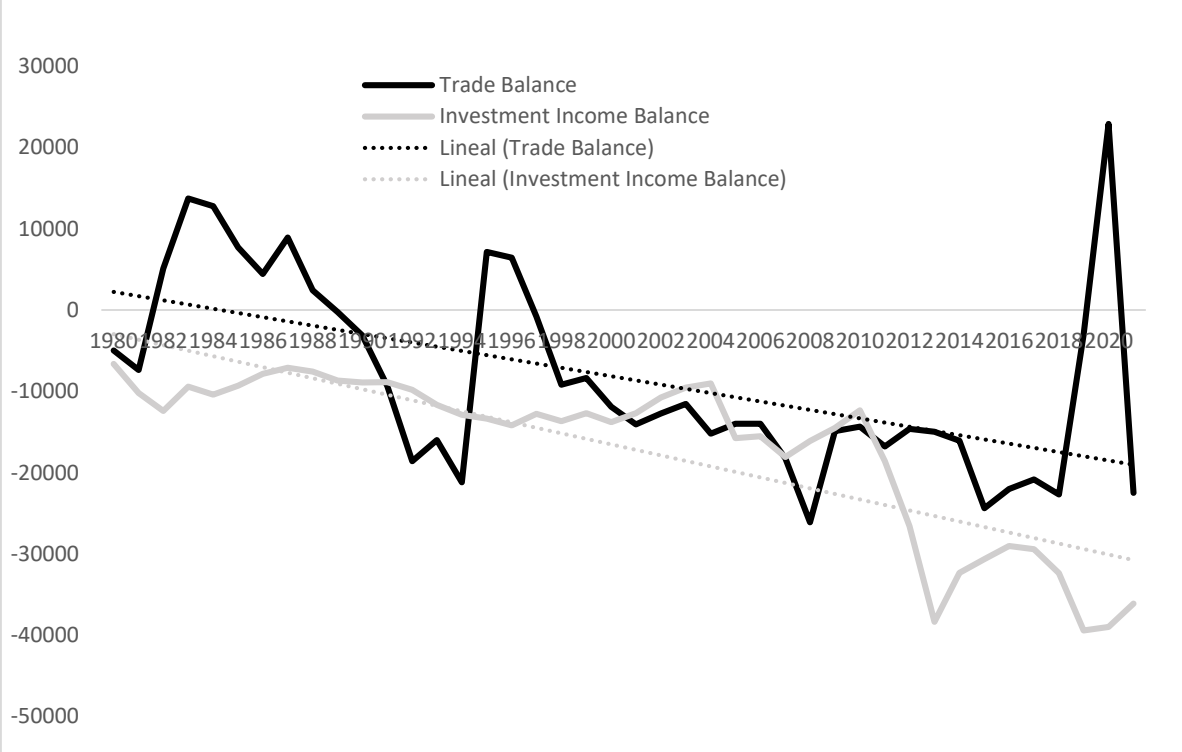

Figure 1. Trade balance and investment income balance, millions of dollars.
Source: Authors' elaboration with data from CEPAL (2021) and Banxico (2021).

Mexico clearly has a problem covering its historical trade balance and the investment income balance deficit. Figure 2 plots the instability of foreign direct investment (FDI), external debt, and portfolio investment as a source of dollars. Portfolio investment skyrocketed during the short period of 2009-2010 but plummeted severely afterwards. Notably, Figure 2 also depicts that remittances have been

the most stable source of external revenue in the most recent quarter of a century. Mexican remittances increased from the beginnings of the 2000s until the Great Crisis, and then stagnated until 2014. However, in the past few years, remittances have skyrocketed. The advantages of remittances over other sources of foreign exchange are that they do not have be paid back, there is no need for a rise in interest rate to attract them, countries do not have sell state-owned companies, countries do not have to pay utilities and dividends, and countries can gain space in planning independent policies. Finally, an additional advantage is that remittances are institutionally embedded, and they are stable since migrants keep strong national ties with their home countries.

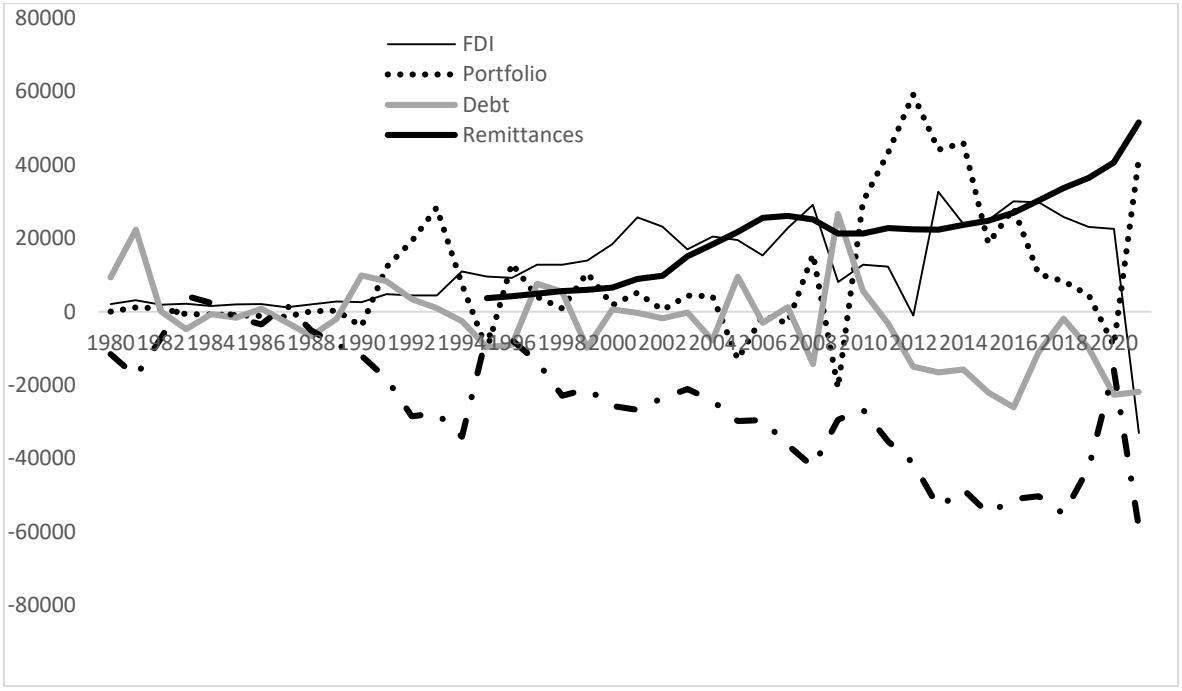

Figure 2. Trade and investment income balance, debt, FDI, and remittances, millions of dollars (net balance).

Debt refers to the short- as well as long-term debt of the federal government, the financial and nonfinancial sectors, and other entities. Capital transfers between households have not been discounted in this plot. All values are net balances less remittances. Data for remittances from Mexico to other countries are available only after 2013. Remittances sent abroad from Mexico represented 3.9 percent in 2013, 4.2 percent in 2014, 3.3 percent in 2015, 2.4 percent in 2016, 2.7 percent in 2017, 3 percent in 2018, 2.7 percent in 2019, 2.2 percent in 2020 and 2 percent in 2021 of the total remittances sent to Mexico from other countries. Mexico is not an important source of remittance payments.
Source: Authors' elaboration with data from CEPAL (2021) and Banxico (2021).

Researchers and international institutions have evaluated the relevance of remittances in their possible effects on the current account, the productive sector, and the financial system. In a study focusing on east Europe and Albania, Meyer and Shera (2015) showed that remittances reduced the current account deficit and the dependence of external borrowing, could possibly increase investments, and were less volatile compared to other sources of financial flows (see also Ratha, 2001). Hughs (2011) noted that worker remittance securitization around the world can benefit poor people and provide resources for development as long as the flow of remittances is stable. Ratha (2001) singled out countries such as Brazil that have issued bonds using as collateral the expected flow of remittances; and in this line,

currently, in Mexico the Grupo Elektra in a company called Nueva Elektra del Milenio has issued notes backed with existing and future reimbursement remittances (in March 2021, FitchRating (2022) downgraded these notes from BBB- to BB+). Encouraging the productive sector, the Economic Commission for Latin America and the Caribbean (CEPAL, 2019b) pointed out that remittances can serve to build regional chains and a social economy and to leverage the financial system.

Finally, arguing on the relationship between remittances and the financial system, Martínez (2010), quoting Demirguc-Kunt et al. (2009), claimed that "remittances are strongly associated with greater banking breadth and depth, increasing the number of branches and accounts per capita and the ratio of deposits to GDP," and Ambrosius (2011) found that, in El Salvador, state-owned banks participate actively in sending and receiving remittances. For this reason, the banking sector of El Salvador is experiencing more development. Ambrosius also noted that remittances can provide liquidity to the financial system and strengthen state-owned banks[4].

Remittances represent a large amount of the gross domestic product and of the gross national income, which considers transfers from abroad. Unlike countries such as Guatemala, Honduras, El Salvador, and Nicaragua, Mexican remittances in the GDP and in the GNI are not as important (Vega e Isidro Luna, 2020; CEPAL, 2019). However, remittances in Mexico are a stable source of external revenue and do contribute to alleviating the current account deficit. Figure 3 depicts the Mexican current account with and without remittances (left panel), and the current account as a percent of the GDP (right panel). In the 2012-2018 period, the average current account as a percent GDP was -2.1 percent; in recent years, the deficit has decreased because the Mexican economy has contracted. Like Mexico, some Latin American countries and peripheral countries in Asia face the same problem. Vernengo and Caldentey (2020) have stated that current account deficits are not sustainable in peripheral countries for one or several years. They consider a low to be a current account deficit of 2.5 and a high deficit one of 7 percent of GDP. They find that

few countries are able to maintain over time a low level of a current account deficit and that no country is able to maintain a high level of the current account deficit. In the case of the upper bound of a 7% current account deficit, 22 countries in Latin America and 41 countries in Asia and the Pacific, were able to sustain this deficit during the course of one year, and 13 and 19 countries respectively over two consecutive years. In the case of the lower bound (2.5% of GDP) the data shows that 19 and 37 countries were able to sustain this current account deficit during a year for Latin America and the Caribbean. And in the case of both regions minority of countries were able to sustain this deficit for more than 4 consecutive years (Vernengo and Caldentey, 2020, p. 4 and 5).

The current account without remittances widened its negative gap compared to a balance current account at the end of the 1990s. The right panel of figure 3 shows that the current account without remittances as a percent of GDP is in the bounds of the Vernengo and Caldentey's benchmark, current account without remittances were -3.1 percent in 2001-2005 period, -3.2 percent in the 2006-2008 period, -3.8 percent in the 2011-2015, and -3.8 percent in the 2016-2021 period. The current account in the Mexican economy would have been unsustainable without remittances in the last 20 years. Thus, remittances provide international purchasing power, and they help to solve problems in the trade balance and the investment income balance deficits. Also, they help avoid crises and can prevent foreign exchange

[4] Recently, the Mexican government has facilitated the sending of remittances, and also a state-owned government 'Banco del Bienestar' can manage the sending of remittances. The gross value of traded remittances for this bank was 2.9 percent of the total remittances in the first half of 2021.

depreciation (and its consequences, such as inflation, worsening income distribution, and debt appreciation). Ultimately, remittances may have other uses that may serve to strength other macroeconomic variables: however, their role in generating and sustaining social and economic development still needs to be tested in a country such as Mexico.

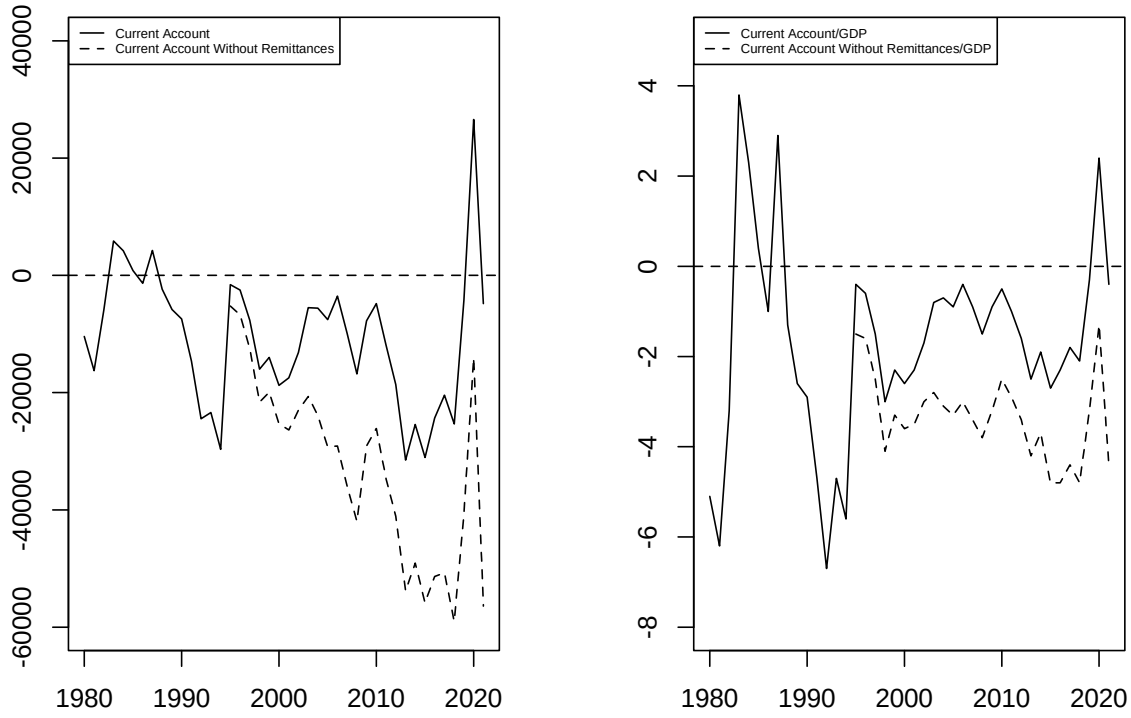

Figure 3. Mexican current account and Mexican current account without remittances (millions of dollars), and current account as a percent of GDP with and without remittances (right).
Source: Author´s elaboration with data from Banxico (2021). GDP in current dollars was obtained from Worldbank (2021).

3.2. Microeconomic point of view.

Mexican households that received income from abroad accounted for 5.1 percent in 2020 (INEGI, 2020, own estimations). Within these households, remittances are the only source of income for 7.1 percent of this population. Microeconomically, remittances increase private consumption and help reduce inequality and poverty in some households (CEPAL, 2019a). Table 1 shows, in the last row, that the probability of migrants sending remittances has increased in the last five years to almost 10 percent of the flow of inland migrants coming from the United States. Also, Table 1 shows that food and clothing and health care are the most important uses of remittances in the receiving country. Interestingly, food and clothing and health care are more important when the likelihood of sending remittances decreases. Thus, the money of the migrants who have worked in the United States and sent remittances to Mexico is spent on the basics.

Table 1. Events of remittances' uses in Mexico, percent.

		2015	2016	2017	2018	2019
Buying land or starting a business	0	1.4	3.1	0.0	2.4	
Building a home	3.3	14.1	13.7	14.4	2.5	
Paying debts		18.4	13.9	14.1	14.7	6.0
Food and clothing		87.5	79.2	73.1	74.3	78.0
Education		11.6	16.4	10.6	11.5	9.3
Health care		34.7	35.6	33.4	31.5	36.4
Rent		3.2	2.6	1.5	.2	2.4
Other		1	1.6	3.4	6.0	3.7
Remittances' senders		18.5	23.7	31.7	32.5	29.7

Remittances' senders are events of remittances senders who worked in United States in the last 12 months divided by the total events of migrants each year. Percentages do not add 100 to because respondents can provide two answers.
Source: Authors' elaboration with data from CONAPO, et al., for several years.

Even though several scholars have noticed the discrepancy between the amount of remittances registered by the Banxico and the Bureau of Economic Analysis (BEA), and the amount registered by national surveys such as the EMIF Norte (Tuiran, Santibañez, and Corona, 2006; Canales, 2008; Fuentes y González, 2012), this section focuses on the importance of microeconomic and demographic data that national surveys such as EMIF Norte can offer. Figure 4 shows that Banxico's level of remittances is larger than the level reported by the U.S. Bureau of Economic Analysis (BEA), and much larger than that estimated by EMIF Norte. First, the U.S. BEA (2021) reports only personal transfers, which is the secondary income payment in the current account: "BEA's estimate of such remittances, called "personal transfers," includes money and goods sent from the foreign-born population resident in the United States to others abroad….Other organizations define remittances more broadly….Other definitions of remittances may also include items such as the income earned by temporary foreign workers."

The BEA does not take into consideration compensation to employees and capital transfer between households in the accountability of remittances. Second, CEPAL (2019a) has stated that national accounts and national surveys have to be used to understand the remittance effect on reducing poverty; in national surveys, as Brown et al. (2014) have noted, surveys have difficulty capturing the complexity of the phenomena, and questions about income are difficult to measure. However, national surveys on migrations permit an understanding of particular characteristics of the remittances and of the migrant senders of remittances in particular flows, such as the inland migration from the United States.

According to Figure 4, resident and nonresident remittances--computed with data from the EMIF Norte with the flow of inland migrants coming from the United States--have different levels, different trends, and a great deal of volatility. First, nonresident remittances are much larger than resident remittances. Second, nonresident remittances are increasing, and resident remittances are decreasing. Finally, nonresident remittances have shown many spikes during the period of analysis, and resident remittances have had only one big spike in the 2007-2009 period and another one in 2019.

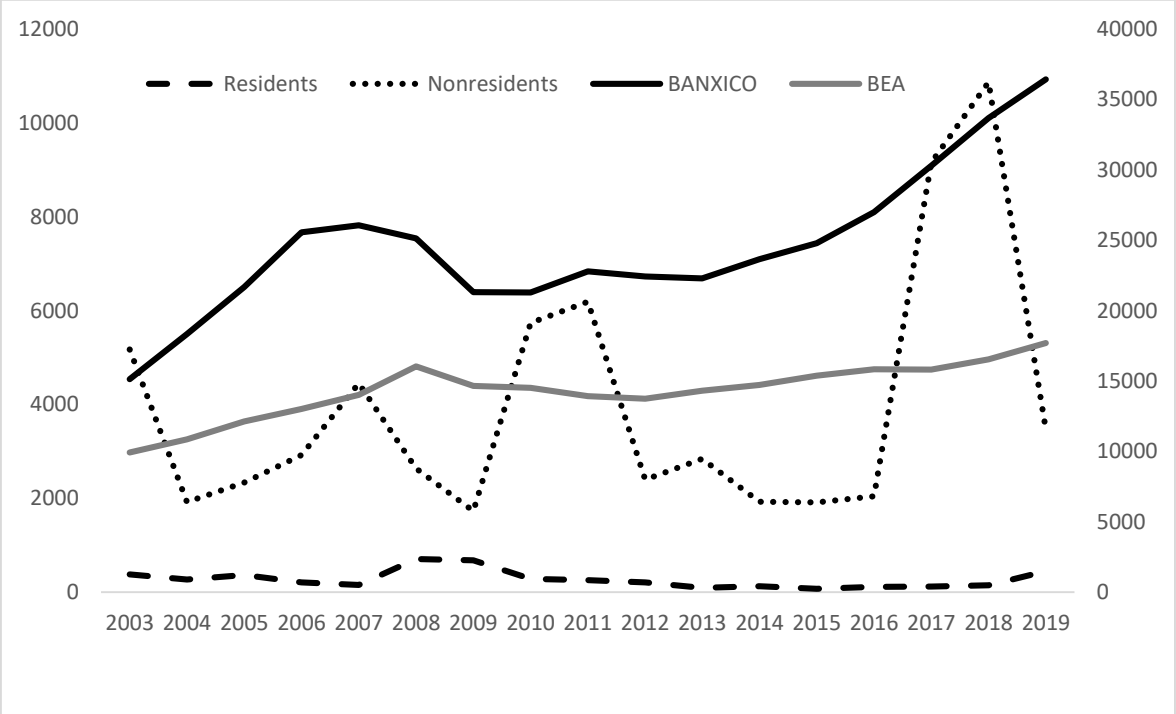

Figure 4. Flow of remittances according to several sources: Banxico, BEA (Right Axis), and the EMIF Norte (Left Axis).

Source: Authors' elaboration with data from CONAPO, et al., for several years; Banxico (2021); BEA (2021).

From 2003 to 2019, nonresidents migrants had a higher probability of sending remittances from the United States to Mexico than residents. However, Figure 5 shows that the likelihood of sending remittances by the residents has increased from 2009 on, and it has impressively risen in the last 3 years. To determine if the type of migrants (resident or nonresident) is associated with the likelihood of sending remittances, we carried out a hypotheses test using chi-square. As was stated earlier, the null hypothesis is that no relationship exists between the type of migrant and the sending of remittances; in contrast, the alternative hypothesis is that that the sending of remittances varies with the type of migrant. The result of the hypothesis testing is in Table 2. If p-values are equal to or larger than 0.05, the null hypothesis is accepted; conversely, a p-value less than 0.05 means that the null hypothesis is rejected and that the likelihood of sending remittances varies with the type of migrant. The null hypothesis is rejected for all years except 2018, so the proportion of sending remittances in the nonresident population is higher than in the resident (as expected).

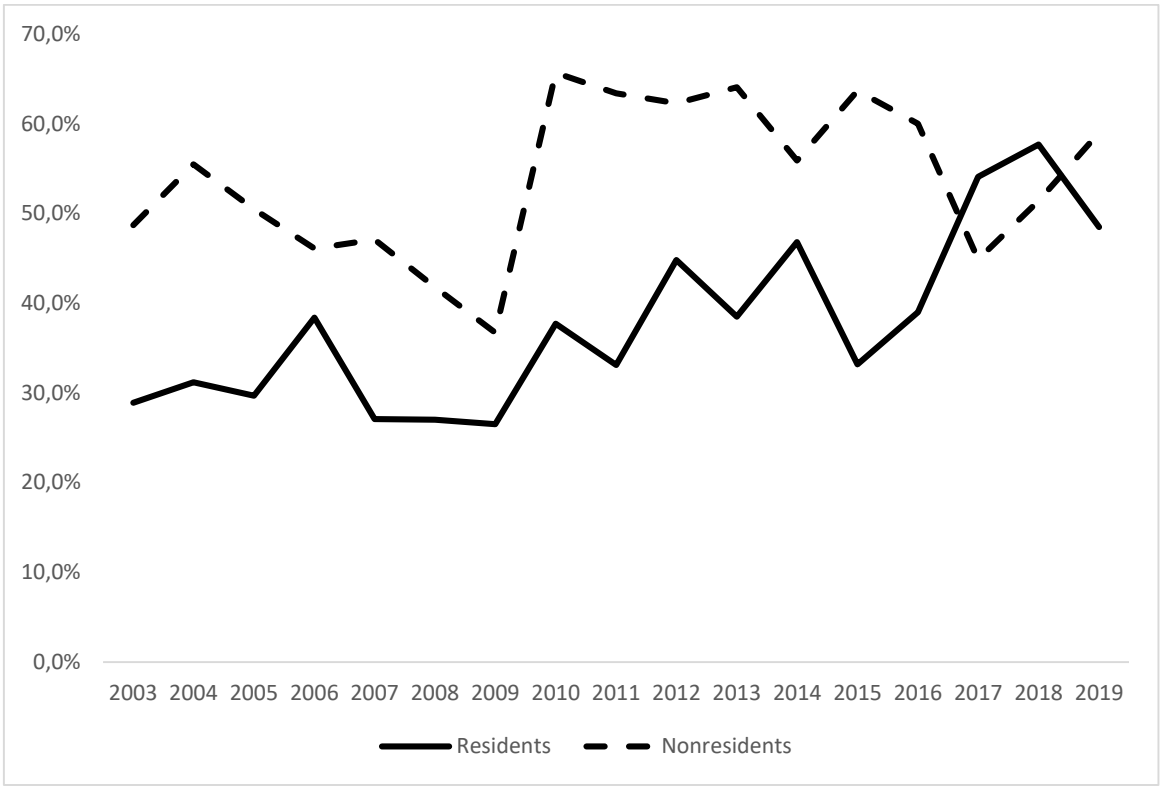

Figure 5. Likelihood of remittances being sent by type of migrant.
Source: Authors' calculation with data from CONAPO et al., for several years.

Table 2. Type of migrant (resident and nonresident) and the likelihood of sending remittances.

Year	X-squared	p-value
2003	120.1	2.492-07
2004	92.359	1.302-08
2005	86.736	8.66e-10
2006	15.312	0.0239
2007	129.15	2.52e-09
2008	83.99	8.365e-07
2009	43.1	0.0002125
2010	309.83	1.651-15
2011	286.86	2.2e-16
2012	57.314	3.448e-07
2013	120.41	2.319-10
2014	17.78	0.01702
2015	106.08	4.228e-07
2016	69.91	5.566e-06
2017	25.64	0.002947
2018	13.33	0.08129
2019	16.215	0.02245

Source: Authors' elaboration with data from CONAPO et al., for several years.

The likelihood of remittances being sent as reported by the EMIF Norte is positively correlated with the amount of remittances being sent registered in national accounts. Therefore, this demographic indicator can mirror the macroeconomic evolution of remittances. Figures 6 shows one full cycle with the two variables, one starting after the dot.com crisis and having an upward trend until 2007. Afterward, the likelihood of remittances being sent bottomed out in 2009 and rose in the 2010-2012 period without an increase in the remittances being sent.

However, from 2014 until 2019, the two variables mirrored each other. Ratha (2001) has pointed out that remittances are less volatile than other flows due to the fiscal system of the rich countries, and that during times of crises many people might return to their home countries, sending then all their money to the home country. Currently, it can be hypothesized that after a crisis, the likelihood of remittances being sent possibly increases, and together with the fiscal system and the economic recovery of the rich countries could explain the upward tendency of the amount of familiar remittances in the last few years.

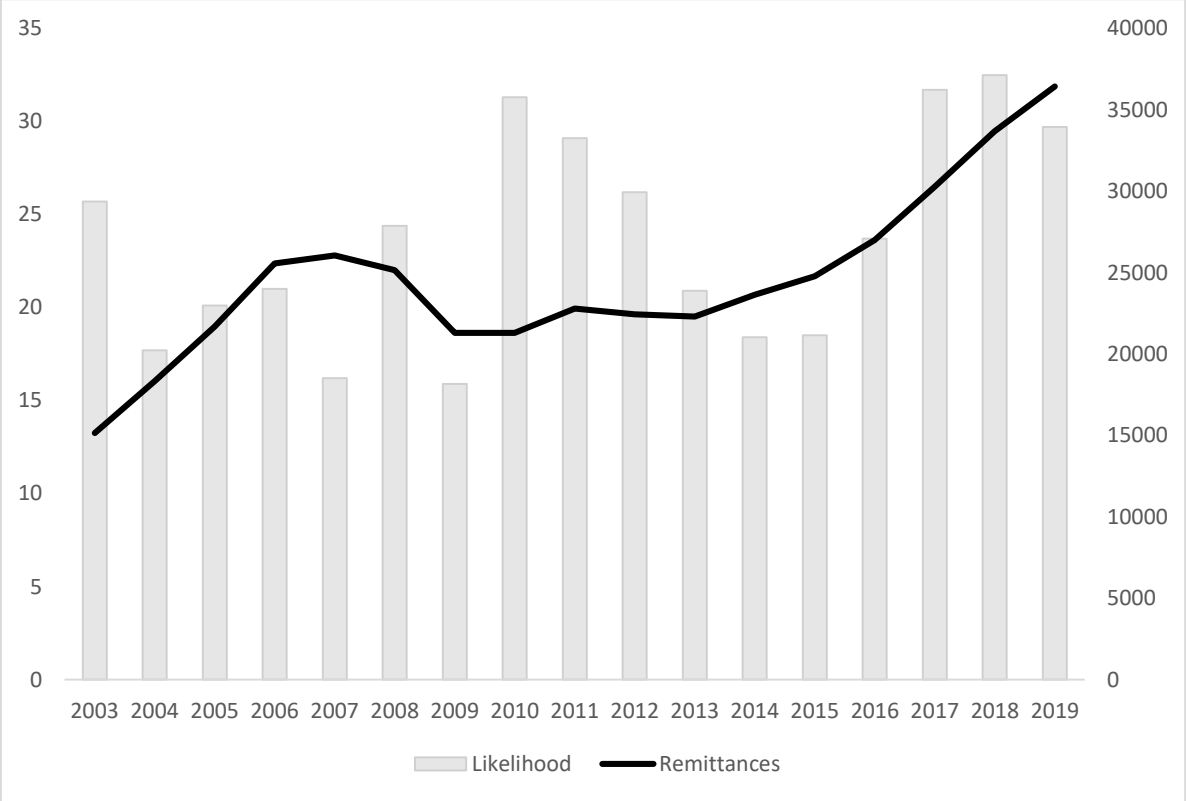

Figure 6. Likelihood of remittances being sent and the amount of remittances, millions US Dollars.

Source: Authors' elaboration with data from CONAPO et al., for several years, and Banxico (2021).

On most occasions during the 2003-2019 period, those who sent remittances were resident and nonresident males, with the resident males more reliably sending remittances than the nonresidents. Also, the number of resident migrants in the United Sates has skyrocketed in the last two years (see Table 3). Second in importance in sending remittances were resident females, who also exhibited an increasing trend during the 2003-2019 period. The nonresident female population has not been statistically

significant for most of these years. Migrants who have worked in the United States and sent remittances to Mexico are younger on average than the total flow of migrants. In particular, the nonresidents are younger than the residents, but the average age of migrants in both groups has been increasing.

Table 3. Events of migrants who sent remittances and work in the united states by sex and average age.

Year	Residents		Nonresidents			
	Male	Female	Male	Female	Total	Total/Total Flow
2003	118222	1682	125430	8572	263906	25.7
2004	86797	11450	48900	1270	148417	17.7
2005	94342	8412	61430	1623	165807	20.1
2006	96006	12438	74068	4778	187290	21.0
2007	74463	12041	82279	3960	172743	16.2
2008	99060	14968	108602	2580	225210	24.4
2009	103357	10928	75569	1884	191738	15.9
2010	143564	19700	105758	9862	278884	31.3
2011	110255	17774	101634	3223	232886	29.1
2012	88589	15909	38205	1561	144264	26.2
2013	76898	17518	51720	1859	147995	20.9
2014	90568	15401	26956	2124	135049	18.4
2015	65038	11624	29278	2653	108593	18.5
2016	107995	25020	29385	1025	163425	23.7
2017	91187	37126	87150	26897	242360	31.7
2018	114128	39059	110831	35878	299896	32.5
2019	164398	31134	41970	3019	240521	29.7
Age	43.4	41.8	34.1	35.1	41.6	

Age: weighted average age, years.
Source: Author's elaboration with data from CONAPO et al., for several years.

Nonresident remittances were computed by the sum of income earned by migrants who worked in the United States and sent money to Mexico. Resident remittances were computed by multiplying three components: migrants who worked in the United States and sent money to Mexico, the average weighted transaction, and the average weighted remittance. By obtaining the growth rate for the resident remittances and observing which of the three components contributes more to the variation of the resident remittance, we found that the number of transfers per year is the most important contributor to the variation of the resident remittance; in second place is the number of migrants.

The amount of resident remittances and the average transaction have a correlation coefficient of 94 percent, and the amount of remittances and the number of migrants have a correlation coefficient of 46 percent. In the periods of 2006-2007 and 2013, migrants sent an average of three or four remittances annually, which is low compared with the average transaction of other years. In the case of the resident migrants, the amount of them who have been working and sending remittances has been increasing, as we saw in Figure 5. However, resident migrants do not send money frequently, as the average transaction

has been low. Therefore, in subsequent studies, the average transaction per year must examined in great depth.

Table 4. Components of the growth of resident remittance, rate of growth percent.

Year	Average Remittance	Transfer per Year	Residents	Remittances
2003	-	-	-	-
2004	2.0	-6.9	-24.4	-28.2
2005	9.0	18.5	4.6	35.1
2006	-1.6	-45.3	5.5	-43.2
2007	-3.3	-2.9	-20.2	-25.1
2008	11.3	208.8	31.8	353.2
2009	-13.6	10.5	0.2	-4.3
2010	-36.9	-53.7	42.9	-58.3
2011	-0.6	16.0	-21.6	-9.6
2012	9.7	-8.2	-18.4	-17.8
2013	-3.1	-51.3	-9.6	-57.4
2014	-9.7	34.6	13.8	38.3
2015	-12.1	-9.1	-24.0	-39.2
2016	12.2	-16.4	62.9	52.8
2017	19.5	-11.1	-3.5	2.4
2018	23.5	-14.3	19.4	26.4
2019	-20.8	197.3	27.6	200.6
Correlation	0.17	0.94	0.46	

Source: Author's elaboration with data from CONAPO et al., for several years.

4. Conclusion.

This article has studied the macroeconomic and microeconomic uses of remittances. From a macroeconomic point of view, remittances are external revenue and serve to diminish the deficit current account. From a microeconomic point of view, specific demographic characteristics can be known by analyzing national surveys such as the EMIF Norte. Five important findings of this article are: (1) remittances cover, to some degree, the historical current account deficit in Mexico; (2) the number of migrants sending remittances has increased in the last few years; (3) the amount of nonresident remittance is higher than the resident remittance; (4) the likelihood of sending remittances is higher in nonresidents than in residents; however, the likelihood of the residents sending remittances has been increasing in recent years; (5) the likelihood of remittances being sent as reported by the EMIF Norte is positively correlated with the amount of remittances being sent registered in national accounts and (6) the most important factor in resident remittance is the average transaction per year.

For subsequent investigations, this article highlights the following avenues: (1) knowing the level of remittances and reconciling national accounts with national surveys are important. However, money transfer companies, which have detailed information about familiar remittances, may not be willing to share this information, so the study of macroeconomic and microeconomic uses of remittances supported by several sources of information is complementary and necessary. (2) Macroeconomic and microeconomic uses of remittances are related and interact in a circular flow. Macroeconomics is not just

the adding of microeconomics. Macroeconomically, remittances are external revenue and prevent foreign exchange depreciation and the possible rise of on inflation. Although many people may send more money to their families with a depreciated rate of foreign exchange, with the depreciation, and with a high import coefficient, Mexican domestic prices may rise (by the pass-through mechanism), resulting in a depreciation of the dollars in the hands of the migrants' families but with less purchasing power.

Also, a further example of the connection of the macro with the micro is the household's behavior in spending their remittances. Families spend on the basics, but consumption also depends on expectations and confidence. With less uncertainty and more confidence, household spending may have higher Keynesian multiplier effects. (3) The analysis of the resident and nonresident senders of remittances allows us to know more of the migrant dynamic between Mexico and the United States. For a more complete analysis of demographic characteristics, we need to acknowledge that behind resident and nonresident migrants are households, families, and communities in the United States and Mexico that need to be studied.

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