https://doi.org/10.29201/peipn.v21i43.228 ISSN 1870-2171

PANORAMA ECONÓMICO, vol. XXI, núm. 43, julio-diciembre, 2025, pp. 31-50

Mexican households in the United States: average income and remittances sent to Mexico

Víctor Manuel Isidro Luna* Francisco A. Martínez Hernández**

Recibido: 5 *de junio del* 2025/*Aceptado:* 9 *de octubre del* 2025

Abstract

Remittances from the developed countries have had microeconomic and macroeconomic effects in peripheral countries over the last 30 years. In Mexico, remittances have grown from US$3,475 million in 1994 to US$64,745 million in 2024. In this article, we show that the behavior of these remittances is cyclical, and while some fluctuations have explanations, comprehensive studies on remittances remain scarce. By analyzing US census data on Mexican households living in the United States, we examine the relationship between the income of Mexican households residing in the United States and remittances received in Mexico. Through a demographic description and error correction model, our results show that there is long-term relationship between household income and remittances.

Keywords: Mexican households in the United States, remittances, average income per household, and error correction model.
JEL classification: F24, F63, F22.

* Profesor-investigador enla Escuela Superior de Economía del Instituto Politécnico Nacional. <visidrol@ipn.mx>.
* Profesor-Investigador en la Universidad Autónoma Metropolitana (UAM) en la unidad Azcapotzalco y es miembro del Sistema Nacional de Investigadores de CONAHCYT con el Nivel 1. <famh@azc.uam.mx>.

Hogares mexicanos en Estados Unidos: su ingreso promedio, y las remesas recibidas en México

Resumen

Las remesas de los países desarrollados a los países periféricos han tenido efectos microeconómicos y macroeconómicos. En México, las remesas crecieron de 3,475 millones de dólares en 1994 a 64,745 millones de dólares en 2024. En este artículo, demostramos que en los últimos 30 años las remesas recibidas en México han tenido una conducta cíclica, y que el ingreso total promedio de los hogares mexicanos en Estados Unidos tiene una relación de largo plazo con la remesa promedio por hogar. Para cumplir nuestros objetivos se utilizan microdatos del censo de Estados Unidos, y se realiza un análisis demográfico y un modelo de corrección de error. Nuestros resultados indican que las remesas son altamente sensibles al ingreso promedio de los hogares de los Mexicanos en Estados Unidos.

Palabras clave: Hogares mexicanos en Estados Unidos, remesas, ingreso promedio por hogar, y modelo de corrección de error.
Clasificación JEL: F24, F63, F22

1. Introduction

Along with international migration, remittances are one of the most important issues in development economics today. The uses and determinants of remittances are worth studying. In the last 30 years, remittances have been important to peripheral countries. For example, in Mexico, remittances totaled US$3,475 million in 1994 and reached a level of US$64,745 million in 2024-an 18.6-fold increase over a 30-year period. Despite remittances being relevant at both the microeconomic level (granting purchasing power to Mexican households) (Goldring, 2004; Pérez Caldentey and Vernengo, 2010; Amuedo Dorantes *et al.*, 2010; CEPAL, 2019; Canales, 2021; Isidro Luna and López Vega, 2023) and the macroeconomic level (easing the current account) (Vernengo and Caldentey, 2010; Islas Camargo and Moreno Santoyo, 2011; Meyer and Shera, 2015; Isidro Luna and López Vega, 2023), its cyclical behavior, its determinants, and the efforts of Mexican households living in the United States to send remittances have hardly been explored.

While some studies have considered the behavior of remittances, research specifically focused on Mexico remains scarce. These explanations range from an increase in the Mexican population living in the United States, an increase in the employment of Mexican people, rational behavior of households trying to maximize their income, errors or changes in the methodology of calculating national accounts, money laundering, a change in the performance of the Mexican economy, a change in the performance of the US economy, and fluctuations in the exchange rate. Considering that increases in remittances have occurred in many Latin American countries (and are therefore not unique to Mexico), and that the determinants of remittances can vary from one surge to another, we have three objectives in this article: 1) to show the cyclical behavior of remittances and the high rate of growth of remittances in the 1998-2006 and 2015-2021 periods; 2) to convey that the average total income of Mexican households living in the United States is a key variable in studying remittances, displaying a long-term relationship between remittances received in Mexico and the average total income of Mexican households living in the United States; and 3) to show (through a deductive approach and with the assumption that all Mexican households living in the United States send remittances) what percentage of income a Mexican household remits per year and what the average frequency of remittances is per year per Mexican household.

After this introduction we proceed as follows. First, we show the cyclical pattern of remittances sent to Mexico and outline several explanations of remittances' determinants. Second, we establish a link among Mexican households living in the United States, average total income of these households, and remittances per household. Subsequently, we carry out an error correction model relating total average income per household to average remittance per household. Then, we outline the percentage of income a Mexican household remits per year, and the average frequency of remittances per household per year. Finally, we mention the limits and scope of this article, and avenues for subsequent research.

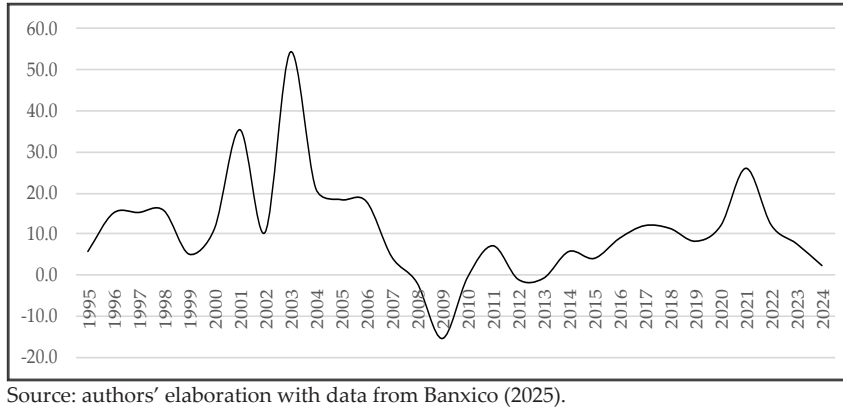
2. Cycles in remittances received in Mexico and determinants of remittances

The level of remittances received in Mexico has increased from US$3,475 million in 1994 to US$64,745.5 in 2024, an 18.6-fold increase.[1] Undoubtedly,

[1] Remittances sent to Mexico are not only from the United States. However, in this article, we are assuming that all remittances come from the United States. For example, US remittances out of the total received were 97% in 2013 and the same amount in 2024, the average in the 2013-2014 period was 96%. Since most remittances come from this country, total remittances is a good proxy for the total remittances coming from the United States.

this outstanding growth of remittances has helped to increase the purchasing power of Mexican households (Amuedo Dorantes *et al*., 2010; CEPAL, 2019; Canales, 2021; Isidro Luna and Lopez Vega, 2023), and to ease Mexico's current account (Pérez Caldentey and Vernengo, 2010; Islas Camargo and Moreno Santoyo, 2011; Canales, 2021; Meyer and Shera, 2015; Isidro Luna and Lopez Vega, 2023). Even though fluctuations in remittances have not been unique to Mexico in the last 30 years, it is important to study Mexican remittances for their magnitude, the dynamics of Mexican households living in the United States, and the percentage of total income a Mexican household remits per year. As can be seen in figure 1, the growth rate of remittances underwent a large slump from 2007 to 2014, bottoming during the economic crisis in 2009; in contrast, the growth rate of remittances has had two surges roughly from 1998 to 2006 and more recently from 2015 to 2021. Notably, each remittance surge was specifically studied at the time, but we do not have much comprehensive research for the whole 30-year period.

Figure 1. Average growth rate of remittances received in Mexico, smoothed line 1994-2024 (percent)



Source: authors' elaboration with data from Banxico (2025).

Explanations for the remittance surges are not abundant in the academic literature, and the little research that has been done has focused on peripheral countries with little research focused on Mexico. In this review, we make no such distinction, and we cover explanations relevant to Mexico and peripheral countries.[2] Despite the relevance of remittances in the developmental

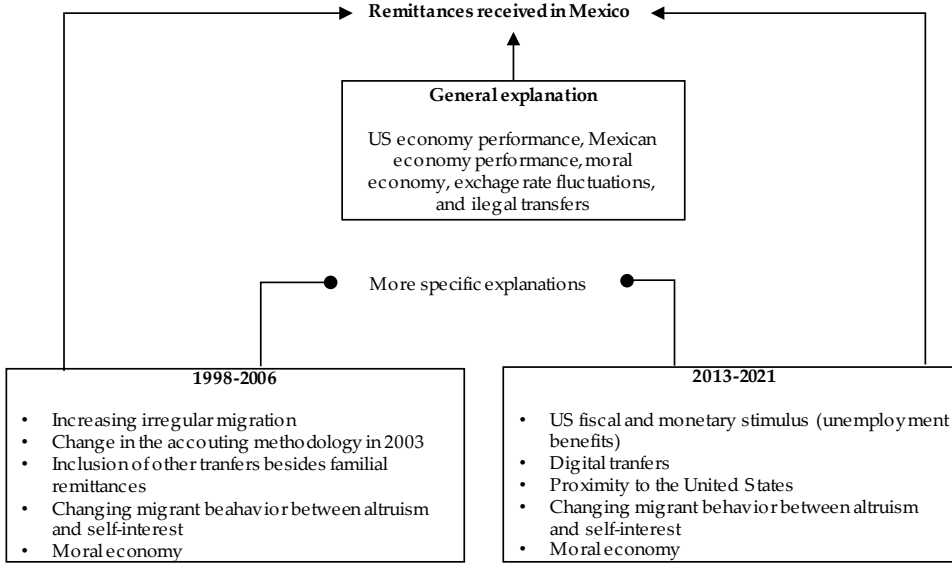
[2] Peripheral countries' analysis is rooted in the Structuralist Latin American school's dichotomy: core-periphery. However, in our analysis third world countries, underdeveloped countries, and developing countries are used as synonyms of peripheral countries.

literature, and the effect that remittances may have on growth and development (Skeldon, 2008; United Nation Development Programme, 2009; Ness, 2023) it is surprising to not find more research on remittance determinants over the 30-year period from 1994 to 2024. Three encompassing explanations are made by Warnecke-Berger (2021) who claims that migrant remittances are an expression of a moral economy between families from core to peripheral countries; Jiménez-Gómez and Flores-Márquez (2023) who find Mexico's GDP, the United States Production Index, and the exchange rate have a long-term relationship with remittances with a structural break at the end of 2002 for quarterly observations using a 1980-2020 period; and Corona and Orraca (2019) who use a monthly time series from 1995 to 2018 to show that Mexico's economic fluctuations and US industrial productivity are the main determinants of remittances received in Mexico.

Now we summarize the explanations for each upward phase. First, for the upward phase of 1998-2006, using a neoclassical viewpoint, Solimano and Allendes (2007) found remittance determinants such as altruism, self-interest, repayment of past investments, diversification of income sources, and family safety. Following this line of thought, Islas Camargo and Moreno Santoyo (2011) found that the decision to optimize financial investments led to a higher volume of remittances for the 1980-2008 period analyzing quarterly data. In contrast, Pérez Caldentey and Vernengo (2010) described that US economic performance and irregular migration determined the amount of remittances; following this macroeconomic line, Figueroa Hernández *et al*. (2015) found that employment of Mexicans livings in the United States and their wages as an important determinant of remittances; and finally, for this period, and most rooted in a demographic viewpoint, Canales (2008) and Tuirán *et al*. (2006) noted that remittance fluctuations, especially in the year of 2003, did not match any demographic pattern and there was either an error in the Mexican accounting system or other kinds of remittances besides familial remittances that were also registered in the balance of payments. Secondly, looking at the upward phase from 2015 to 2021, and especially within and after the pandemic, explanations have varied. Some scholars have taken the neoclassical viewpoint for this surge, and they have highlighted a trade-off between altruistic and self-interest motives (Cuecuecha Mendoza and Cruz Vazquez, 2022). Conversely, other scholars have followed a more aggregate approach. Bansak *et al.* (2024) have debated if fiscal and monetary stimulus and the proximity to the United States have determined remittances in these years, and Vlaicu (2022) has noted fiscal and monetary stimulus and the availability of digital transfers to explain the increase in remittances

during and after the pandemic. Diagram 1 summarizes the variables that can possibly determine the level of remittances in Mexico (and of course in some other peripheral countries).

Diagram 1. General and more specific explanations revolving around determinants of Remittances



Source: authors' elaboration.

3. Mexican people and households in the United States, and remittances received in Mexico from 1994 to 2024

Familial remittances are unilateral transfers which are sent by foreign-born residents or temporary workers in another country. It is thought that temporary workers have a higher likelihood than residents to send money, and that remittances are financial transfer from developed countries to peripheral countries. Since 2003, the Central Bank of Mexico (Banxico) has tracked remittances using data from companies used to remit money. Canales (2008) has studied the relationship between total first-generation Mexicans living in the United States[3] and the total number of remittances sent to Mexico; he reached the conclusion that demographic variables did not explain the

[3] Total people born in Mexico living in the United States.

increase during the 1998-2006 period. There are other approaches for measuring remittances. The United States Government Accountability Office (GAO) (2006) -in a document entitled "International Remittances: Different Estimation Methodologies Produce Different Results"–makes a comparison between two methodologies to compute familial remittances by two sources: the Inter-American Development Bank (IDB) and the Bureau of Economic Analysis (BEA). IDB computes remittances using surveys and then finds the percentage of population that sends remittances and the average per capita remittance. For example, in 2003 through a sample of Latin American countries, IDB found that nearly 70 percent of adults send remittances, an average remittance of US$240, and a 12.6 average frequency that an individual remits per year. Like IDB, BEA also computes a population of remitters and the percentage of total income a household remits per year; however, unlike the IDB, their population of remitters is determined by the duration of stay of adults in the foreign-born population, and the presence of children in the household. Meanwhile, the percentage of total income a household remits per year is determined by proximity to the United States and the presence of children in the household. GAO's comment on BEA's methodology (GAO, 2006):

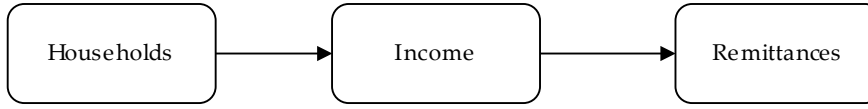
> BEA obtains these proportions by making assumptions based on its judgment. BEA assumes that the place of birth of the adult foreign-born population does not affect the likelihood of remitting but that it does affect the percentage of income remitted. BEA also assumes that, once the presence of children in the household and the duration of stay are accounted for, men and women are equally likely to remit. In effect, only the presence of children in the household and the duration of stay determines the percentage of the adult foreign-born population that remit to their countries of birth... (p. 30).

Even though BEA and Bank of Mexico's estimations of remittances differ (Canales 2008; Fuentes Flores and González Andrade, 2012; BEA, 2021a, BEA, 2021b; Isidro Luna and López Vega 2023), BEA's computation connects demographic information which we can obtain through the US census (United States Census Bureau, 1994-2004a) to the total remittance received in Mexican households. With the US census, it is possible to collect information on Mexican born people living in the United States, duration of stay of the head of household,[4] average number of people per household, and average number of people under 18 per household. Also, we can get information regarding the total income where the head of household was born in

[4] While the US census defines a family by birth, marriage or adoption, a household represents people living in a single housing unit.

Mexico. Then, in our analysis we link Mexican household, household total income, and the level of remittances as outlined in diagram 2.

Diagram 2. Relationship among household, income, and remittances



Source: Authors' elaboration

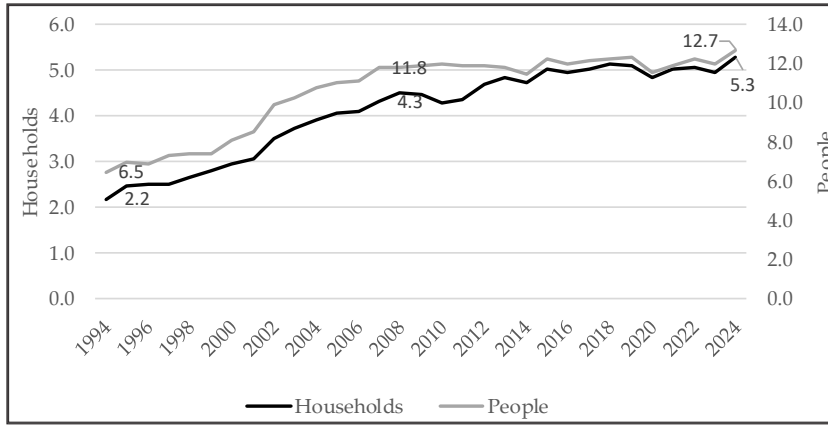
A Mexican household living in the United States, in this article, is defined as a household where the head of household was born in Mexico or, in other words, the head of household is a first generation Mexican living in the United States.[5] Even though the head of the household is a Mexican, other inhabitants such as spouse or children may be born in the United States. The household analysis takes into account the following: 1) regular as well as irregular migration, 2) resident and temporary workers, 3) the head of household is an adult, so it must have a high likelihood to remit, 4) a simple computation of average total income per household which is a key element to compute remittances not only for the GAO (2006) but also for other leading authorities in studying remittances such as Brown *et al*., (2014). Besides, since it is our objective, the household unit also takes into account the duration of residency for the head of household, the average number of people per household, and the number of people under 18 per household. We proceed with these characteristics of a Mexican household living in the United States: duration of stay of Mexican household, average number of people per household, average number of people under 18, and average total income per household.

First, there were 6.49 million Mexican people and 2.18 million Mexican households in the United States in 1994, and 12.7 million people and 5.30 million households in 2024. The number of people has grown a factor of 1.96 while the number of households has grown a factor of 2.4; the number of people has grown less than the number of households. As can be seen in Figure 2, Mexican people and households grew at a high rate from 1998 to 2008, afterwards decreasing slightly during the 2008-2009 crisis. From 2012 to 2018 both the number of people and households remained almost flat,

[5] From now on households where the head of household was born in Mexico are referred to as Mexican households.

and in the 2020-2024 period both saw a rebound. These household patterns mirror the fluctuations of remittances in some spans of time, both increasing in the 1998-2008 period, a slump with the 2008-2009 crisis, and growing in the 2020-2024 period. However, household behavior does not explain the fluctuation of remittances during the pandemic; Mexican households declined while remittances skyrocketed.

Figure 2. People living in the United States who were born in Mexico and households where the head of household was born in Mexico, 1994-2024, (millions)

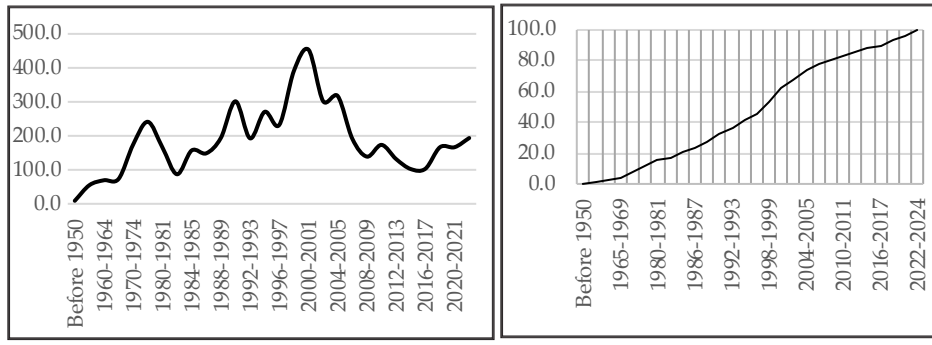


Source: authors' elaboration with data from United States Census Bureau (1994-2024a and 1994-2024b).

Secondly, the majority of Mexican heads of household came to the United States years ago. There was an increase in Mexican immigration to the United States from 1980 to 2001, which was mostly provoked by the debt crisis throughout the 1980s and the Mexican 1995 crisis (see figure 3; see also López Vega *et al.* 2002). After, from 2002 to 2004, Mexican immigration to the United presented high volumes but with decreasing levels of heads of household each year. Subsequently, Mexican immigration to the United States declined until it bottomed out in the 2012-2017 period. Finally, despite the pandemic shock for international mobility, in the 2018-2024 period, Mexican heads of household in the United States had an unexpected recovery. Figure 3 (right side) shows the cumulative percentage of Mexican heads of household entering the United States; 33.6 per cent of Mexican heads of household came to the United States in the 1980-1998 period. A similar amount, 31.4 percent,

but in a shorter period, came from 1998 to 2007, while 12.8 percent arrived in the 2008-2017 period. And, surprisingly, in the last 6 years, 10.1 percent of the accumulated Mexican heads of household arrived in the United States. While BEA's data shows a negative correlation between the duration of stay and the likelihood that people remit, high volumes of Mexican immigration to the United States match the upward phases of remittances.[6]

Figure 3. Mexican heads of the household entrance to the United States,before 1950-2024, smoothed line, (thousand), and cumulative frequencies



Source: authors' elaboration with data from United States Census Bureau (1994-2024a and 1994-2024b)

Third, a paramount fact in Mexican households living in the United States is a severe decline in the number of people per household and the number of people under 18 years old per household.[7] The number of people per household was 4.5 in 1994, declining to 3.5 in 2024. Similarly, the number of people under 18 years old per household was 1.9 and decreased to 1.0 in 2024. Both indicators rose slightly with the 2008-2009 economic crisis (see figure 4).[8] And, even though in the last 6 years the number of Mexican heads of

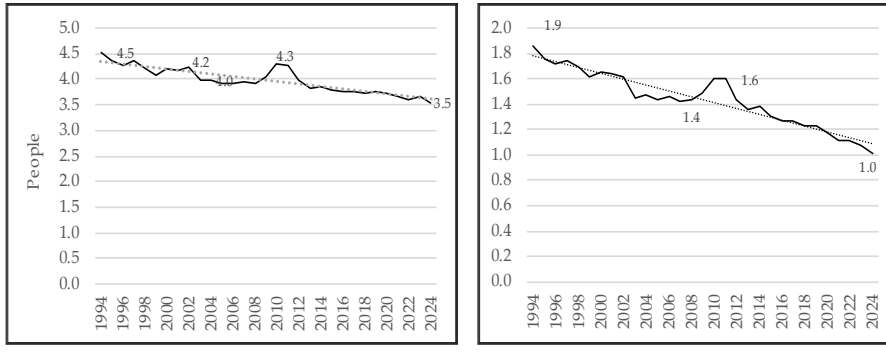
[6] Adult foreign likelihood to remit is always under discussion. In 2003, BEA estimated a likelihood of 54 percent for a sample of Latin American countries, and in the same year the IDB found a likelihood of around 70 percent. Besides that, as GAO reported, the likelihood to remit may be affected by the proximity to the United States. Computing data from a Mexican migration survey of the flow of inland migrants coming from the United States, the likelihood of residents and temporary workers to remit might be in the range of 40 to 60 percent from 2011 to 2019. Also see the results of the Mexican survey on migration in its North border (CONAPO *et al.*, 2011-2019).

[7] The head of household must be Mexican; however, other inhabitants may be other nationalities. For example, it can be a Mexican head of household married to a US citizen, or a Mexican head of household with children born in the United States.

[8] There was also a high number of people that returned to Mexico from the United States in the 2005-2010 period; according to statistics, 859,000 people returned to Mexico from the United States. It might be possible that some family members went to live in another Mexican household.

household has increased in the United States, people under 18 have continued to decline. In BEA's methodology, a decrease in the presence of people under 18 years old is an important factor for both the likelihood of remittance and the percent of income that is remitted by foreign-born people. Therefore, the decrease in people per household and people under 18 years old may provoke Mexican people to remit higher volumes of money to Mexico.

Figure 4. Average people per household, 1994-2024 and average people under 18 per household, 1994-2024 (people)



Source: authors' elaboration with data from United States Census Bureau (1994-2024a and 1994-2024b).

Finally, total income per household "is the arithmetic sum of the amounts received by all income recipients in the household" (United States Census Bureau, 2023, 7-12), and for Mexican households, the average total income was US$27.1 thousand in 1994, and reached US$77.4 thousand in 2023, increasing by a factor of 2.9, and growing faster than the consumer price index.[9] Average income increased by US$10 thousand in the 1998-2006 period, starting at US$33 thousand in 1998 and reaching US$43.2 thousand in 2006. Conversely, average income stagnated during the 2007-2012 period and started to rise consistently after 2013, starting at US$46 thousand in 2013 and growing consistently to US$77.4 thousand in 2023 (see figure 5, left side plot).[10] Social security income, self-employment income and by far earnings have been the main component of total average income. These three components of total income have only declined drastically in crises, being the most recent the COVID crisis (see figure 1A in the Appendix). During the year of

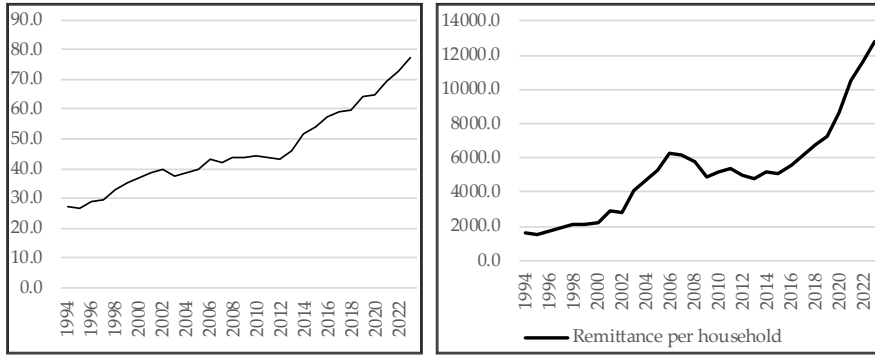
[9] Total average income is estimated as in the United States census bureau's technical documentation (1994-2024b).

[10] US supplement census reports income of the previous year. For example, 2024 supplement provides data on income in 2023.

2019, alimony and child support, rental income, pension income, education income, and interest income increased for Mexican households, and during the year of 2020, unemployment compensation, education income, and interest income helped to Mexican households to keep their level of income.

Then, even though we can see correlations between the unemployment rate and the US economy with remittances, average total income is a better indicator because it shows the amount of money migrants have and therefore expresses the capability of a household to remit. As has been noted, to estimate the total dollar amount of remittances, BEA's methodology uses total income of foreign-born people. Figure 5 (plot to the right) displays the total US dollar amount of remittances per Mexican household living in the United States (total dollar amount of familial remittances received in Mexico divided by the number of Mexican households). Upon an inspection of the plots and our previous analysis leads us to think that total Mexican household income may have a long-term relationship with remittances.

Figure 5. Average total income per household (US$ thousand), and remittance per household (US$ dollars), (1994-2023)



Source: authors' elaboration with data from United States Census Bureau (1994-2024a and 1994-2024b).

4. A cointegration and error correction model

Average total income per Mexican household may have a long-term relationship with remittances. In this section we perform an error correction model relating average total income per Mexican household to the remittances per household over the 1994-2023 period. To achieve our objective, we carry out the following steps: 1) show that the time series are non-stationary at levels, but their first differences are stationary; 2) run the error correction

model, and 3) determine the number of cointegrating vectors and the results of the diagnostic tests.

First, we apply unit root tests at levels and to the natural logarithm (ln) first-differences time series. The results of the Augmented Dickey-Fuller (ADF), Phillips-Perron (PP), and Kwiatkowski–Phillips–Schmidt–Shin (KPSS) unit root tests suggest that the two economic series are non-stationary stochastic series at levels, I(1), i.e., they require a first difference (Δ) in order to be transformed into stationary series. The econometric results of these tests are shown in table 1.

Table 1. Order of integration of time series

Variables	ADF			PP			KPSS	
	A	B	C	A	B	C	η_μ	η_r
ln (Income/hoseholds)	-1.58	0.1	4.7	-1.58	0.07	4.56	0.11	0.7
Δ ln (income/households)	-5.23	-5.33	-3.15	-5.23	-5.33	-3.26	0.09	0.11
ln (remittances/households)	-2.6	-0.4	3.43	-1.63	-0.55	2.74	0.1	0.64
Δln (remittances/household	-4.48	-4.56	-1.75	-4.61	-4.68	-3.56	0.1	0.1

Note: Δ indicates first difference. Conclution: the theree series are not stationary series, I(1).
Model A coniders a constant and a trend, model B considers only a constant and model C does not include anything.
The bold squares indicate the rejection of the null hyphotesis at 5% significance level.
η_μ and η_r represent the KPSS statistics, where the null hypothesis considers that the series are stantionary in levels around a deterministic level, respectively.

Source: authors' calculation.

The first requirement of cointegration and error correction models (VECM) has been fulfilled, i.e., the economic series are non-stationary (see Asteriou and Hall, 2011). Once we found evidence that the economic series at levels were non-stationary, we run an error correction model. Equation 1 represents the cointegration vector (in parentheses) between the ln of remittances per households (dependent variable, lRem_House) and the ln of average income per households (independent variable, lInc_House). In equation 1, the gamma coefficient denotes the error correction. The short-run relationship is denoted by the variables in differences, Δ. The econometric result for the equation is shown in table 2.[11]

[11] A model with structural change was also tested in 2003, but the dummy variable was not significant.

$$\Delta lRem\_House_t = \alpha_0 + \sum_{i=1}^{k} \alpha_{i+1}\, \Delta lRem\_House_{t-i} + \sum_{i=1}^{k} \beta_{i+1}\, \Delta lInc\_House_{t-i} + \gamma(lRem\_House_{t-1} - \delta_1 lInc\_House_{t-1}) + v_{t1} \quad (1)$$

Table 2. Error correction model, results

Dependent variable: ΔLremittances_Households	Long run coeficcient LIncome_Houselholds (t-ratio) (p-value)	ECM Coeficcient (t-ratio) (p-value) γ	R^2-adj	Dummy Variable	Number of lags
Period: 1998-2003	**1.910**	-0.41	0.33	N.A.	3
Obs: 26	(11.26)	(-3.59)			
	(0.17)	(0.11)			

Source: authors' elaboration.

Regarding equation 1, the results in table 2 suggest that a 1 percent increase in the average income per household is associated with an increase of 1.91 percent in remittances per household, meaning there is a high impact from average household income on average household remittances. Then, if Mexican households have each year more money, then would remit more money to Mexico. The error correction coefficient meets the specifications required for VECM models (see Asteriou and Hall, 2011, p. 326). Furthermore, the results of the Johansen-Juselius cointegration in table 3 (we use three lags), and the values of the diagnostic tests–JB normality (p=0.90), White Heteroskedasticity (p=0.67), and LM autocorrelation (p=0.21)–support the adequacy of this model.[12]

[12] Even though econometric technique is not clear. Figueroa Hernández *et al.*, (2015) find high elasticities of unemployment of Mexican people living in the United States and their wages on remittances.

Table 3. Cointegrating equations

Hypothesized No. Of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None*	0.464724	16.3602	15.49471	0.037
At most 1	0.004256	0.110897	3.841465	0.7391

Note: trace test indicates 1 cointegrating eqn(s) at the 0.05 level
Source: authors' elaboration.

5. Further remarks on remittances: percentage of income Mexican households remit and the average frequency of remittances by Mexican households per year

Average remittance per household and average total income per household has a long-term relationship. Also, less people per household and less people under 18 years old living in the household may lead to a higher volume of remittances received in Mexico. However, there are two further topics worth exploring: percentage of income a Mexican household remits per year and the frequency in which a household remits per year. Figure 6 depicts these patterns. First, the percentage of income a Mexican household remits increased from 5.9 percent to 16.6 percent during the 1994-2023 period. In 2023, Mexican households remitted US $12,800 per year, i.e., a great effort by Mexican households. The percentage of income a Mexican household remits sharply increased from 7.1 percent in 2002 to 10.9 percent in 2003 and reached its first peak in 2007 with a level of 14.6 percent. This percentage bottomed in 2015, and after this date it started a second wave reaching higher levels than in the first. Comparing our results with the IDB's results from 2003 of a survey of 21 Latin American countries, annual remittances sent to their home countries were valued at US$3,024; in our exercise, in the year of 2003, the average remittance sent to Mexico was estimated at nearly US$ 4,000; however, given that Mexico is closer to the United States and our analysis is carried out at the Mexican household level, it makes sense that Mexico's annual remittances are higher than the average Latin American remittance. A level of US$4000 in 2003 and US$12,800 in 2023 are both reasonable; however, we think more research must be done in this avenue. Secondly, the average frequency a household remitted per year was 4.6 times in 1995 and 31.2 times in 2023. A sharp increase is seen from 2002 to 2003, which then peaked in 2006. In the second wave, the average frequency

a household remitted per year reached its maximum in 2022. It is important to note that the frequency a household remitted per year estimated by IDB in 2003 (GAO, 2006) was 12.6 times and in our exercise was 12.9 times (see figure 6). However, like in the percentage of income a Mexican household remits, we express a note of caution. Considering that not all Mexican households remit, a lower bound for average operations per year must be currently higher than 31.2 times. To conclude, although there is a long-term relationship between remittances per household and average income per household, two topics that deserve more exploration are percentage of income a Mexican household remits and frequency a Mexican household remits per year.

Figure 6. Percentage of income remitted per household (left side), and average frequency of remittance per household (right side)

Source: authors' elaboration with data from United States Census Bureau (1994-2024a and 1994-2024b) and Banxico (2025).

6. Conclusion

Using US Census data, we showed a correlation between average total income for Mexican households living in the United States to remittances per Mexican household for the 1994-2023 period. Regarding the limits and scope of this article, our main limit in this research is that we used a simple deductive and statistical approach based on analysing household income to remittances, followed by an econometric exercise. We presented new findings and reached conclusions in the analysis of remittances received in Mexico.

Findings that are presented in this article are: 1) a household analysis of the Mexican people living in the United States; 2) the relevance of the presence of children living in the household (the number of children per household has consistently declined for the 1994-2024 year period), 3) the long-term relationship between remittance per household and average total income per household expressed in a simple way. Our results have shown through an error correction model that a 1 percent increase in the average income per household is associated with an increase of 1.91 percent in remittances per household, these results have shown not only that there is a high impact from average household income on average household remittances but also that Mexican people in the United States have kept strong ties with their relatives. Although our result agrees with other research on remittances, we think further research must dig deeply into the following: 1) the average frequency a Mexican household remits per year, 2) the percentage of income a Mexican household remits per year, and 3) the analysis of other households that may remit i.e., a non-Mexican head of household (such as a US head of household with a Mexican spouse), or also when remittances are sent between friends.

Acknowledgments

Authors would like to thank anonymous reviewers for all their useful comments. Víctor Manuel Isidro Luna would also like to thank to Tanadej Vechsuruck, Lynzee Lee and Zebo Idrisova for comments and suggestions to a previous draft of this paper. All mistakes are the authors' responsability.

References

Amuedo Dorantes, C.; A. Georges, and S. Pozo (2010). Migration, Remittances, and Children´s Schooling in Haiti. *The Annal of the American Academy of Political and Social Science*, 630(1), 224-244. https://www.jstor.org/stable/20743996. https://doi.org/10.1177/0002716210368112.

Asteriou, D., y S. Hall (2011). *Applied Econometrics*. Palgrave Macmillan.

Banco de Mexico (Banxico) (2025). *Ingresos por remesas. Banco de Mexico* (*Banxico*) https://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?accion=consultarCuadro&idCuadro=CE81&locale=es.

Bansak, C.; and H. Glebocki., and N.B. Simpson (2025). The impact of the U.S. Covid-19 response on remittance flows to emerging markets and developing economies. *International Economics* 182. https://doi.org/10.1016/j.inteco.2025.100580.

Brown, R. P.C.; S. Fransen., J. Carling, J., and M. Siegel. (2014). Measuring Remittances Through Surveys: Methodological and Conceptual Issues for Survey Designers and Data Analysts. *Demographic Research*, 31(41), 1243-1274. doi: 10.4054/DemRes.2014.31.41. https://doi.org/10.4054/DemRes.2014.31.41.

Bureau of Economic Analysis (BEA). (2021a). What are remittances, how big are they, and why might BEA's estimate differ from estimates released by other organizations? *Bureau of Economic Analysis* (BEA) https://www.bea.gov/help/faq/481.

Bureau of Economic Analysis (BEA). (2021b) 'International Transactions, Expanded Detail by Area and Country', *Bureau of Economic Analysis* (BEA) https://apps.bea.gov/itable/itable.cfm?reqid=62&step=1.

Canales, A. I. (2008). Las cifras sobre remesas en México ¿Son creíbles? *Migraciones Internacionales*, 4(4), 5-35. https://doi.org/10.17428/rmi.v4i15.1141.

Canales, A.I. (2021). Estudio de las contribuciones de las migraciones recientes al desarrollo sostenible: el caso de México. In Pizarro Martínez, J., and Cano Christiny, M.V (Eds.), *Sobre las contribuciones de la migración al desarrollo sostenible. Estudios en países seleccionados* (pp. 115-180). Comisión Económica para Económica para América Latina y el Caribe.

Comisión Económica para América Latina y el Caribe (CEPAL). (2019). *Panorama social de América Latina*. Comisión Económica para América Latina y el Caribe (CEPAL).

Consejo Nacional de Población (CONAPO), Secretaría del Trabajo y Previsión Social (STPS), Unidad de Política Migratoria, Registro de Identidad de Personas (UPMRIP), Secretaría de Relaciones Exteriores (SRE), Secretaría de Desarrollo Social (SEDESOL), Consejo Nacional para Prevenir la Discriminación (CONAPRED) and EL COLEF. (2011-2019) *Encuesta sobre Migración en la Frontera Norte (EMIF norte)*. Consejo Nacional de Población (CONAPO), Secretaría del Trabajo y Previsión Social (STPS), Unidad de Política Migratoria, Registro de Identidad de Personas (UPMRIP), Secretaría de Relaciones Exteriores (SRE), Secretaría de Desarrollo Social (SEDESOL), Consejo Nacional para Prevenir la Discriminación (CONAPRED) and EL COLEF. https://www.colef.mx/emif/.

Corona, F., and P. Orraca. (2019). Remittances in Mexico and their unobserved components. *The Journal of International Trade & Economic Development*, 28(8), 1047–1066. https://doi.org/10.1080/09638199.2019.1630847.

Cuecuecha Mendoza, A., and M. Cruz Vásquez. (2022) 'Impact of the Covid19 Pandemic on Remittances to Mexico', *Revista mexicana de economía y finanzas* 17(3), 1-26. https://doi.org/10.21919/remef.v17i3.653.

Figueroa Hernández, E., Pérez Soto, F., & Godínez Montoya, L. (2015). La migración y las remesas en México: 1980-2010. Noesis. *Revista De Ciencias Sociales Y Humanidades*, 24(47), 21–50. https://doi.org/10.20983/noesis.2015.1.1.

Fuentes Flores, N. A., and S. González Andrade. (2012) 'Medición de las remesas familiares de los migrantes mexicanos en EUA, 1993-2007', *Análisis económico*, 27(65), 151-170.

Goldring, L. (2004) 'Family and Collective Remittances to Mexico: A Multi-dimensional Typology', *Development and Change,* 35(4), 799-840. ttps://doi.org/10.1111/j.0012-155X.2004.00380.x.

Isidro Luna, V., and R. López Vega (2023). Remittances to Mexico. Macroeconomic and microeconomic uses. *SUMMA*, 5(1), 1-17. https://doi.org/10.47666/summa.5.1.2.

Jiménez Gómez. A., and H. Flores Márquez. (2023). Determinants of the remittances sent to Mexico 1980-2022: was there a structural change? *Econo Quantum*, 20(4), 1-30. https://doi.org/10.18381/eq.v20i2.7293.

López Vega, R.; Isidro Luna, V. M., Reyes Miranda, A., and L. Vazquez Santiago (2022). *Índices de Intensidad Migratoria México-Estados Unidos*. Consejo Nacional de Población (CONAPO).

Meyer, D. and Shera, A. (2015) *Remittances' impact on the labor supply and on the deficit of current account*. BERG Working Paper Series.

Ness, I. (2023) *Migration as Economic Imperialis. How International Labour Mobility Undermines Economic Development in Poor Countries*. Polity.

Pérez Caldentey, E., and M. Vernengo. (2010). Back to the future: Latin America's current development strategy. *Journal of Post Keynesian Economics*, 32(4), 623-644. http://dx.doi.org/10.2753/PKE0160-3477320408.

Skeldon, R. (2008). Migration and Development. *United Nations*. United Nations https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/unpd_egm_200809_paper_skeldon_mig_and_dev.pdf.

Solimano, A., and Allendes, C. (2007). *Migraciones internacionales, remesas y el desarrollo económico: la experiencia Latinoamérica.* Comisión Económica para América Latina y el Caribe.

Tuirán, R., J. Santibáñez., and R Corona, R. (2006). El monto de las remesas familiares en México. ¿Mito o realidad? *Papeles de Población* 50, 147-169.

United States Government Accountability Office (GAO). (2006). *International Remittances. Different Methodologies Produce Different Result.* United States Government Accountability Office (GAO).

United States Census Bureau. (1994-2024a). Annual Social Economic Supplements. *United States Census Bureau*. https://www.census.gov/data/datasets/time-series/demo/cps/cps-asec.html.

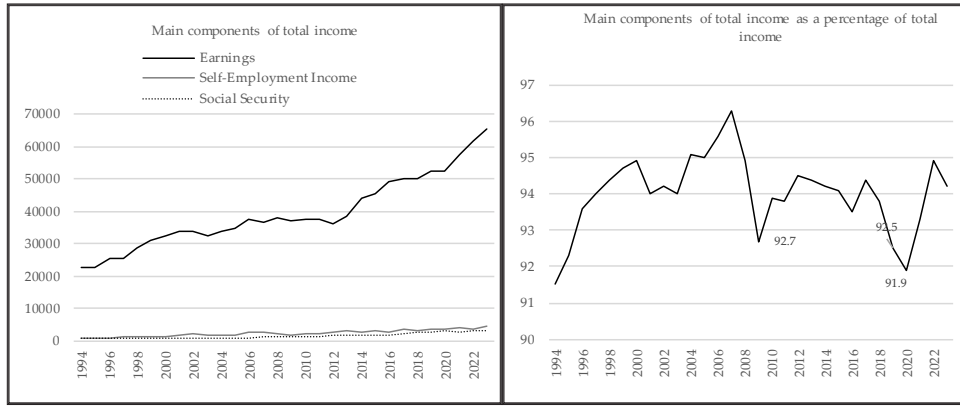
___ (1994-2024b). *Technical Documentation. United States Census Bureau.* https://www.census.gov/data/datasets/time-series/demo/cps/cps-asec.html.

Vlaicu, R. (2022). *Why Remittances Soared as the Pandemic Raged*. https://blogs.iadb.org/ideas-matter/en/why-remittances-soared-as-the-pandemic-raged/.

Warnecke-Berger, H. (2021). Dynamics of global asymmetries: how migrant remittances (re-)shape North-South relations. *Third World Quarterly*, 42(11), 2767-2784. https://doi.org/10.1080/01436597.2021.1954501

Appendix

Figure 1A. Main Components of Average Total Income US$ Dollars and Percent



Source: authors' elaboration with data from United States census bureau (1994-2024a and 1994-2024b).