https://doi.org/10.21670/ref.2307118

Articles

Cross-border workers or international commuters at the Mexico-US border: evolution and economic importance

Trabajadores transfronterizos o *commuters* internacionales en la frontera México-Estados Unidos: evolución e importancia económica

Pedro P. Orraca Romano[a]* https://orcid.org/0000-0003-0215-1251

[a] El Colegio de la Frontera Norte, Departamento de Estudios Económicos, Tijuana, Mexico, e-mail: porraca@colef.mx

Abstract

This article analyzes the evolution of cross-border workers who reside in Mexico and work in the United States and quantifies their economic importance. Based on census information and the ENIGH, a series of linear regression and Tobit models are estimated. During the 2000-2020 period, the number of cross-border workers grew slightly and the share of US-born within this group increased substantially. In 2020, cross-border workers contributed 7.3% of the salary mass and disbursed 7.5% of the total expenditures made in the municipalities of northern Mexico. Moreover, having a cross-border worker in the household is associated with an expenditure that is 56.8% higher in Mexico and 283.1% higher in the United States. Being a cross-border worker represents an effective strategy for the people from northern Mexico with the possibility of working in the United States to maximize their income and access a better quality of life.

Keywords: cross-border workers, international commuters, cross-border shopping, Mexico-US border.

Received on July 21, 2022.

Accepted on March 30, 2023.

Published on April 17, 2023.

* Corresponding author: Pedro P. Orraca Romano. E-mail: porraca@colef.mx

ORIGINAL ARTICLE LANGUAGE: SPANISH.

Resumen

Este artículo analiza la evolución de los trabajadores transfronterizos que residen en México y laboran en Estados Unidos y cuantifica su importancia económica. Con base en información censal y la ENIGH se estiman modelos de regresión lineal y Tobit. Durante el periodo 2000-2020, el número de transfronterizos aumentó ligeramente y la participación de los estadounidenses dentro de este grupo se incrementó sustancialmente. En 2020, los transfronterizos aportaron 7.3% de la masa salarial y ejercieron 7.5% del gasto total de los municipios del norte de México. Además, el tener a un transfronterizo en el hogar se asocia con un gasto 56.8% mayor en México y 283.1% mayor en Estados Unidos. El ser transfronterizo representa

CITATION: Orraca Romano, P. P. (2023). Trabajadores transfronterizos o *commuters* internacionales en la frontera México-Estados Unidos: evolución e importancia económica [Cross-border workers or international commuters at the Mexico-US border: evolution and economic importance]. *Estudios Fronterizos*, *24*, e118. https://doi.org/10.21670/ref.2307118

para las personas del norte de México con posibilidades de laborar en Estados Unidos una estrategia efectiva para maximizar su ingreso y acceder a un mejor nivel de vida.

Palabras clave: trabajadores transfronterizos, *commuters* internacionales, compras transfronterizas, frontera México-Estados Unidos.

Introduction

Cross-border workers or international commuters are those individuals who live in one country and cross an international border daily, or at least once a week, to work in another country and then cross the border again at the end of their workday to return home. These people live a binational life where their transit between two countries allows them to take advantage of the various consumer, recreational, and employment opportunities offered on both sides of the border.

Cross-border labor is a significant phenomenon in the U.S.-Mexico border region. In 2020, the population of international commuters residing in Mexico's northern border municipalities totaled 87 675 people, of whom 55 553 were born in Mexico and 31 998 in the United States. There is also another group of cross-border workers who reside in the U.S. states contiguous to the southern border of the United States and work in Mexico, with a population of approximately 16 723 individuals.[1]

This article analyzes the recent changes in the status of cross-border workers or international commuters residing in Mexico and working in the United States and quantifies their economic importance in their municipalities and states of residence. Estimating the impact of this contingent on their localities is important because, although they constitute only a fraction of the total number of workers in the region, their high levels of income and consumption mean that they can affect various sectors of the economy. Moreover, their importance and the effects they generate are not limited to Mexico since cross-borderers pay various taxes and spend a significant portion of their income in the United States. Therefore, by analyzing commuters and their contribution to the economy, the study represents an additional input to better understand the economic and social dynamics of the U.S.-Mexico border region.

The presence of cross-border workers in northern Mexico dates back to the late 19th century, when rapidly expanding U.S. cities such as El Paso began to recruit Mexican workers (Herzog, 1990). Until the 1920s, Mexicans residing along the border could move freely between the two countries. Nevertheless, economic difficulties and lack of jobs led the U.S. government to change its immigration policy and establish the immigration law of 1924, which required Mexican commuters to have immigrant visa form 1-151, 551 or to have a green card or permanent residency (Estrella Valenzuela, 1993). In the mid-20th century, several southern U.S. border cities relied on Mexican

[1] Own calculations based on the 2020 Population and Housing Census (Inegi, 2021) and the 2019 American Community Survey (Ruggles et al., 2023).

workers to meet part of their labor needs (Herzog, 1990). According to estimates of the U.S. Immigration and Naturalization Service (INS) agency, in 1969, there were 49 770 cross-border workers with a green card and about 20 000 U.S. citizens living in Mexico and working in the USA (Estrella Valenzuela, 1993).

Cross-border workers are a diverse and heterogeneous group. On the one hand, the population authorized to work legally in the United States includes U.S. citizens who are generally of Mexican descent, people born in Mexico and who have permanent U.S. residency, and those with a work visa. On the other hand, some commuters are not authorized to work legally in the United States, although they do so regardless. This group is mainly made up of individuals who enter the United States legally but with documents that do not allow them to work, such as a temporary visitor visa, for example, a B1/B2 visa or a border crossing card (BCC).[2] While attempting to cross the border, they must convince border agents that they are entering the United States for shopping or recreational activities, not work (Chavez, 2016).

The economic incentives to work in the United States are substantial for Mexico's northern border region residents. In 2020, Mexicans in the region earned an average monthly wage of 8 808.3 Mexican pesos (MXN), while among those who worked in the United States, their wage was MXN 26 969.1. In the case of Americans residing in the region, those working in Mexico received a monthly wage of MXN 13 877.5, less than the MXN 30 329.2 received by commuters.[3] Despite this, many people living and working in the northern border region, including those with a U.S. temporary visitor visa, are not interested in working illegally in the United States. Nonetheless, another group of people do not have access to this documentation and therefore have no way to enter the U.S. labor market, whether documented or undocumented, and their only option to do so is to migrate illegally to the United States.

Since relatively few studies focus on cross-border workers in the U.S.-Mexico border region, this article adds several contributions to the literature. First, the number of commuters is estimated, and their socioeconomic characteristics are analyzed according to their country of birth. Second, descriptive statistics are used to quantify cross-border commuters' economic importance for their residence municipalities. This is done by calculating their contribution to the wage bill and analyzing, at the household level and in the aggregate, their expenditures in Mexico and those in the United States, which enables a partial quantification of their contribution to the border economies. Third, using linear and censored regression analyses, an examination of the evolution of the wage premium associated with cross-border work and how having a commuter in the household is associated with expenditure levels in Mexico and the United States is carried out.

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[2] The BCC or DSP-150 is a B1/B2 temporary visitor visa that allows the holder to enter the United States and enter the country within 25 to 75 miles north of the international border for a period of up to 30 days. The card is issued to applicants who are citizens and residents of Mexico, who must demonstrate that they have strong enough ties to their home country to motivate them to return after a temporary stay in the United States (U. S. Department of State, n. d.).

[3] Author's calculations based on Population and Housing Census 2020 (Inegi, 2021). Figures in MXN as of March 2020.

The text is structured as follows: next, the theoretical framework is presented, and the related literature is recapitulated. Subsequently, the databases used are described, the methodological strategy is explained, and the results are presented. Finally, a brief recapitulation of the findings is made, and future avenues of research are discussed.

Theoretical framework and literature review

Cross-border work

International labor mobility and access to a foreign labor market can be achieved through emigration to another country or cross-border commuting. This decision can be viewed as a function of variables that have a differential impact on the costs of migrating relative to those associated with crossing the border daily and disparities in the characteristics of the country of origin and destination (Huber & Nowotny, 2013). Therefore, the choice to migrate or to be a cross-border commuter depends on a series of individual characteristics such as income, type of employment and occupation, length of the working day, commuting costs and time, and family structure, among others. It also depends on multiple characteristics of the countries of origin and destination, such as housing prices, access to and quality of public services, the ethnic composition of the population, and levels of security (Kim et al., 2005). As the conveniences and benefits of residing in the home country become greater, people will find it more attractive to commute and choose to be cross-border commuters rather than migrants.

Working across the border allows people to benefit from the social and economic resources of each country (Chavez, 2016); however, these opportunities are not equally available to all residents of these binational regions, with some groups having access to them and others being excluded from these benefits (Sarabia, 2016). Migration and border control policies, rules and regulations, and institutions can restrict the volume and shape the profiles of cross-border workers (Alegría Olazábal, 1992; Alegría, 2002; Broersma et al., 2022). Whether people can overcome these obstacles and obtain cross-border employment depends in part on several individual characteristics such as their country of birth, skill level, gender, knowledge of the language spoken at the destination, marital status, and their networks on the other side of the border, among others (Gottholmseder & Theurl, 2007).

According to neoclassical theory, cross-border labor is partly subject to differences in economic factors such as wages, particularly the wage gap between the two countries, and the jobs available on both sides of the border (Broersma et al., 2022). Salaries in the destination country may be high enough to offset the cost of traveling from the home country. From the perspective of the new economics of labor migration, cross-border employment can also be a domestic strategy to diversify risks, overcome economic hardship and maximize the opportunities offered by labor markets on both sides of the border (Coubès, 2008).

The literature analyzing commuters on the U.S.-Mexico border dates back more than 50 years. Pioneering studies examined its impact on the U.S. border region, including its effects on wages and the economic dynamics of these localities (Ericson, 1970) and how this phenomenon has been impacted over time by changes in U.S. immigration laws (Estrella Valenzuela, 1993). The socioeconomic characteristics and wages of cross-border workers have also been analyzed, where it has been observed that despite being employed in generally unskilled jobs in the United States, in terms of their wages, they occupy a privileged position in Mexico (Acuña González, 1988; Arámburo Vizcarra, 1987; Orraca-Romano, 2019). In the case of women, a significant portion of this group is employed in occupations related to care and cleaning services (López Estrada, 2020; Orraca Romano, 2015), while men work mostly in activities related to retail, gardening, cleaning, and construction (Escala & Vega, 2005). Other studies have examined the strategies used by commuters to enter the United States, particularly those used by individuals who worked in an unauthorized manner with a BCC (Chavez, 2016) and the perceptions of cross-border commuters regarding their treatment by U.S. border agents (Castañeda Perez, 2022). Evidence has shown that cross-border workers tend to have binational networks, good English language skills, cars for travel, and the necessary documentation to enter the United States legally.

Furthermore, they are mostly men and female heads of household, are slightly more qualified than non-cross-border workers, and in recent decades the proportion with professional studies has increased (Alegría, 2002; Orraca-Romano, 2019; Vargas Valle & Coubès, 2017). Compared to Mexicans who migrate to the United States, commuters tend to be older, have lower levels of education, are employed in worse occupations, and earn lower wages (Orraca Romano, 2015). Regarding the determinants of being a cross-border commuter, these are directly associated with the wage differentials between Mexico and the United States (Alegría, 2002) and negatively associated with the levels of violence in Mexico, where, due to the increase in the levels of insecurity and violence in the country since the 2000s, a significant number of cross-border commuters have chosen to migrate to the United States (Orraca-Romano & Vargas-Valle, 2020).

Cross-border purchases or foreign expenditure

A characteristic of the economies of localities in the U.S.-Mexico border region is their residents' cross-border shopping or expenditures on the other side of the border.

On an individual level, in the decision to engage in cross-border shopping, people primarily value the trade-off between the benefits of acquiring a range of products at lower prices and the costs associated (including time) with commuting. Lower prices at the destination will increase expenditures abroad, while higher relocation costs will decrease them (Chandra et al., 2014; Ferris, 2010). Likewise, access to other

types of products abroad, which are different from those consumed at origin, and the socio-cultural differences between the country of origin and destination, constitute factors that, for some people, will be attractive and therefore incentivize cross-border purchases. In contrast, for others, they will be prohibitive and lead to low or zero levels of expenditure abroad (Spierings & Van der Velde, 2013).

At an aggregate level, cross-border purchases positively impact businesses in the neighboring country of destination where the purchases are made and harm businesses in the country of origin where these people live because a greater number of cross-border purchases implies a decrease in sales at the origin. On the one hand, in economies exposed to cross-border purchases, fiscal policy plays an important role because differences in taxes and tax rates between countries create opportunities for this type of expenditure. Also, by enabling expenditure abroad, cross-border purchases generate many tax policy constraints for governments (Ferris, 2000). For example, high taxes at the origin on certain products can lead to the price differential between products being so large compared to the destination that it affects cross-border purchasing decisions, increasing expenditure abroad and decreasing local sales (Asplund et al., 2007; Ferris, 2000). Therefore, for these businesses to increase their sales, they should have access to a lower tax rate; this can harm tax collection levels (Nielsen, 2001). In addition, economic dynamics at the origin are also sensitive to the taxes imposed at the destination. This implies that governments and their revenue levels are affected by cross-border purchases and can affect them through their fiscal policy. On the other hand, cross-border purchases are also related to the exchange rate. A stronger exchange rate increases the number of cheaper products abroad (Chandra et al., 2014).

The literature analyzing foreign expenditure and cross-border shopping in the U.S.-Mexico border region has done so from the perspective of Mexican consumers and U.S. retailers. Among the first is the work of Díaz González and González-König (2016), who examine the purchases of Mexicans in the United States and show that residing in the northern border region or states with a migratory tradition in western Mexico and having the necessary documentation to enter that country legally are the main determinants for making cross-border purchases. Among those examining the phenomenon from the perspective of U.S. establishments, Fullerton and Walke (2019) quantify the importance of cross-border shopping for employment levels in U.S. counties contiguous to the border and show that the MXN-USD exchange rate and per capita output growth levels in Mexico's northern border states affect employment levels in the southern United States. This is consistent with the findings of Savage and Blankmeyer (1990) and Patrick and Renforth (1996), who find that retail purchases in U.S. border cities are sensitive to the MXN-USD exchange rate, with sales being higher when the peso is strong or overvalued and lower when the currency depreciates or devalues. Finally, it has also been observed that the entry into force of the North American Free Trade Agreement (NAFTA) led to a decline in retail purchases

in different U.S. border cities, where the decline is attributed in part to the fact that the economic integration brought about by trade liberalization generated greater homogeneity in the products offered by retailers in the two countries and discouraged cross-border purchases (Adkisson & Zimmerman, 2014; Ford et al., 2009).

Data

Census information is used to study the recent changes in the status of cross-border workers, including the size of this contingent, their socioeconomic characteristics, and their contribution to the wage bill in their municipalities of residence. Specifically, use is made of microdata from the public sample of the 2000 General Population and Housing Census, the 2010 Population and Housing Census, the 2015 Intercensal Survey, and the 2020 Population and Housing Census. This information was obtained through the Minnesota Population Center (2020) and the National Institute of Statistics and Geography (Inegi, for its acronym of Spanish, Instituto Nacional de Estadística y Geografía). The sample is limited to people of working age or 18 to 65. Cross-border or commuter are terms used to refer to individuals residing in Mexico who report that they work in the United States.

To analyze the expenditures of Mexican households, both in Mexico and the United States, and to estimate their contribution to the total expenditure in their municipalities and states of residence, the National Survey of Household Income and Expenditures (ENIGH, for its acronym of Spanish, Encuesta Nacional de Ingresos y Gastos de los Hogares), in its 2010, 2012, 2014, 2016, 2018 and 2020 editions, is used. The ENIGH is a nationally representative household survey collected biennially by Inegi. On the individual level, the ENIGH captures information on the socioeconomic characteristics and the various sources of income of the different members of the household. At the household level, it reports the expenditures made during the last six months, including whether these were made in Mexico or abroad; however, the survey does not allow us to identify the country abroad in which the expenditure was made. To simplify the nomenclature, it is assumed that all foreign purchases were made in the United States. This implies that U.S. expenditure levels will be slightly overestimated. Similarly, a cross-border household is defined as a household where at least one person reports that they work in the United States.

Finally, the study focuses on the states and municipalities along Mexico's northern border. Monetary figures are reported in MXN at March 2020 prices. Due to the sample size, the census allows for individual or aggregated analysis of the different municipalities. In contrast, the ENIGH sample is much smaller and only allows us to examine cross-border households at the aggregate or regional level. Therefore, the analysis carried out with the ENIGH is done jointly for all the border municipalities and all the northern border states.

Methodological strategy

Firstly, to examine the evolution of the wage premium associated with cross-border work and whether it varies according to the country of birth of the worker, a series of models is estimated for each period using the ordinary least squares (OLS) method. Specifically, wage equations are estimated based on Mincer (1974), who showed that the human capital model generates a concave age-income profile over the working life cycle. The models are defined as follows:

$$y_i = X_i \beta + \gamma_1 (commuter_i \times MX_i) + \gamma_2 (commuter_i \times EUA_i) + \sum_t \delta_t + \sum_s \mu_s + \varepsilon_i \qquad (1)$$

where y_i is the logarithm of the hourly wage of worker i; $commuter_i$ is a dichotomous variable that takes the value of 1 if the person works in the United States and 0 if in Mexico; X_i is a vector of characteristics at the individual, household, and local levels that affect the wage; MX_i and EUA_i are binary variables that take the value of 1 if the person was born in Mexico or the United States, respectively; δ_t denotes time-fixed effects and μ_s state-fixed effects; and ε_i is the random or error term. The vector X_i is composed of variables indicating age, age squared, years of schooling, a dichotomous variable that reveals whether the person is married or living in a common-law marriage, the number of hours worked per week, a binary variable denoting whether the worker is salaried, the number of people residing in the household, and a dichotomous variable indicating whether the household is located in a rural locality. Alternatively, equation (1) is also estimated without the $commuter_i$ variable interacting with the country of birth of the worker. This is done to broadly calculate the evolution of the wage premium associated with cross-border work. Finally, to control for heteroscedasticity problems, robust standard errors based on White (1980) are used in all estimates.

Subsequently, to analyze how having a cross-border worker in the household is associated with expenditures in Mexico and the United States, a pair of Tobit models are estimated for each year that the ENIGH was collected from 2010-2020. This model, originally proposed by Tobin (1958), is used when the dependent variable is censored and has a single censoring point, while in the case of control variables, all sample values are observed. In other words, let y_i be a censored and observed variable and y_i^* an underlying (latent) variable.

On the one hand, for observations where $y_i^* > 0$, $y_i > 0$ values are observed; on the other hand, for observations where $y_i^* \leq 0$, only $y_i = 0$ is observed. While this is not necessarily problematic when examining household expenditures in Mexico, it is problematic when analyzing cross-border purchases or expenditures in the USA. Specifically, the expenditure in the United States is a censored variable or limited dependent variable because a significant portion of the observations takes the value of zero. This is explained by the fact that it is extremely difficult for many households in

Mexico's northern border states to purchase in the United States because they do not have the documentation to enter the country legally. The distribution of a censored variable is a combination of a continuous distribution and a discrete one (Bleda Hernández & Tobías Garcés, 2002, p. 188), and not taking censoring into account and estimating the model by OLS will generate biased estimators.[4] Consequently, the model is defined as follows:

$$y_i^* = X_i \beta + \gamma commuter_i + \varepsilon_i \text{ con } y_i = \text{máx}\,(0, y_i^*) \text{ y } \varepsilon_i \sim (0, \sigma^2) \quad (2)$$

where, in the first specification, y_i^* represents quarterly household expenditure in Mexico and, in the second, denotes expenditure in the United States. The independent variable of interest $commuter_i$ takes the value of 1 if a cross-border worker resides in the household and 0 if not. Controls in X_i also include a series of demographic and socioeconomic characteristics of the head of household; household-level variables, including the total number of members and the number of minors; and municipal controls, including a dichotomous variable that indicates whether the household is located in a rural locality and another that denotes whether it is a municipality adjacent to the border. Finally, the unconditional marginal effects of the Tobit models are presented to facilitate the interpretation of the results. These capture the effect of a small variation in the variable of interest (in this case, having a cross-border worker in the household) on the unconditional expected value of the response variable (i.e., household expenditure in Mexico or the United States).

Results

How many are there, and where do they reside?

Table 1 presents information on cross-border workers. Between 2000 and 2020, the commuter population increased by 3.3%, from 84 919 to 87 675. When these workers are divided according to their country of birth, there are significant differences between those born in Mexico and those born in the United States. On the one hand, during this period the number of Mexican cross-border migrants contracted by 23.1%, from 72 219 in 2000 to 55 553 in 2020. On the other hand, the U.S. commuter population increased by 165.7%, from 12 042 to 31 998 people. This means that Americans went from representing 14.2% of cross-border workers in 2000 to 36.5% in 2020. It also highlights that, in relative terms, the number of commuters is decreasing. While in

[4] While, in the case of household expenditures in the United States, 87.8% of the observations are censored or take the value of zero, in the case of expenditures in Mexico the observations only take zero values in 0.1% of the cases. Therefore, estimating the Mexican expenditure premium associated with cross-border work by the OLS method or by means of a Tobit model produces similar results.

2000, 4.1% of the workers in border municipalities were commuters, in 2020, this figure stood at 2.6%. It can also be observed that, among Americans, slightly more than two-thirds (or 67.3%) of those who work do so in the United States; conversely, among Mexicans, only 1.7% work there. This reflects the fact that while Americans can participate in the labor markets of both countries, for most Mexicans their only option is the Mexican labor market, and suggests that, if they had access to the U.S. market, the percentage of cross-border workers would increase considerably. When commuters are separated by gender, it is observed that this group is mostly comprised of men; however, given the rapid growth of women's labor participation levels in Mexico, it is not surprising that their share has increased from 22.8% in 2000 to 28.5% in 2020.

Table 1. Cross-border workers by country of birth and gender

Country of birth	2000	2010	2015	2020
Number of cross-border workers				
Mexico	72 219	54 698	58 658	55 553
United States	12 042	16 791	27 942	31 998
Total	84 919	72 332	87 318	87 675
total % of cross-border workers				
Mexico	85.0	75.6	67.2	63.4
United States	14.2	23.2	32.0	36.5
% that are cross-border workers				
Mexico	3.5	2.2	2.1	1.7
United States	61.4	49.8	65.2	67.3
Total	4.1	2.8	3.1	2.6
By gender				
Women	19 352	21 223	26 718	25 033
Men	65 567	51 109	60 600	62 642
total % of cross-border workers				
Women	22.8	29.3	30.6	28.5
Men	77.2	70.7	69.4	71.5

Note: The table includes employed individuals between 18 and 65 years of age residing in Mexico's northern border municipalities. The "total" category includes all cross-border workers, regardless of their country of birth. Calculations were made using expansion factors.
Source: created by the author based on the General Population and Housing Census 2000, Population and Housing Census 2010, Intercensal Survey 2015, and Population and Housing Census 2020

Table 2 presents information on the commuter population in the six municipalities with the highest numbers. A significant portion of this population resides in Tijuana (39.4%), followed by Mexicali (15.8%) and Juarez (13.6%). This is explained both on the labor supply side, given that these cities constitute significant agglomerations of people with diverse skills and qualifications with the capacity to enter the U.S. labor

market, and on the demand side, where the dynamism of the economies of the U.S. cities of San Diego, Calexico and Imperial Valley, and El Paso implies that in these localities there is high demand for labor and numerous jobs that facilitate labor-market participation.

The relative importance of cross-border workers to the local labor force is highest in San Luis Rio Colorado (9.0%), Tijuana (3.8%), and Mexicali (3.0%). Likewise, during the 2000-2020 period, the relative number of commuters decreased overall and individually in each of the municipalities presented in Table 2.

Table 2. Cross-border workers by the municipality of residence

Municipality	2000	2010	2015	2020
Number of cross-border workers				
Tijuana	26 222	28 882	38 036	34 520
Mexicali	17 284	11 457	13 014	13 830
San Luis Rio Colorado	6 988	4 089	6 416	6 771
Juárez	14 193	9 879	9 604	11 907
Nuevo Laredo	4 180	4 244	5 470	4 953
Matamoros	3 815	2 920	3 226	2 743
% of cross-border workers				
Tijuana	5.67	4.61	5.48	3.81
Mexicali	6.09	3.11	3.21	3.03
San Luis Rio Colorado	13.53	6.78	9.09	9.04
Juárez	2.91	1.98	1.72	1.81
Nuevo Laredo	3.89	3.09	3.69	2.91
Matamoros	2.49	1.65	1.68	1.21

Note: The table includes employed individuals aged 18 to 65 who reside in the municipalities along the northern border of Mexico and work in the United States. Calculations made using expansion factors.
Source: created by the author based on the General Population and Housing Census 2000, Population and Housing Census 2010, Intercensal Survey 2015, and Population and Housing Census 2020

What are they like, and how much do they differ according to their country of birth?

This subsection compares the socioeconomic characteristics of cross-border workers in 2000 and 2020 and examines whether these differ according to individuals' country of birth. The information is presented in Table 3.

Overall, during the 2000-2020 period, commuters' average age and years of schooling increased, their marriage rate decreased, and the percentage of women increased, as did the percentage reporting having resided in the United States five years earlier. Regarding labor variables, the percentage of cross-border commuters working full-time decreased while their hourly and monthly incomes increased.

Table 3. Characteristics of cross-border workers by country of birth

Variable	2000			2020		
	Mexico	*USA*	*Difference*	*Mexico*	*USA*	*Difference*
Age	37.9	30.2	7.7***	41.9	31.0	10.8***
Married (%)	77.3	66.8	10.5***	74.0	64.2	9.8***
Head of household (%)	70.0	43.9	26.1***	61.3	42.5	18.8***
Child of a head of household (%)	13.1	29.8	16.7***	15.1	26.7	11.6***
Male (%)	78.9	69.5	9.4***	76.2	67.4	8.8***
Years of schooling	8.6	10.8	2.2***	10.4	11.7	1.3***
School attendance (%)	3.6	12.0	8.4***	2.2	5.0	2.8***
5 years before in the USA (%)	8.0	24.3	16.3***	7.4	25.4	18.0***
Hours worked	42.3	41.7	0.6	42.5	40.8	1.7**
Full-time (%)	89.7	90.1	0.4	87.8	86.5	1.3
Monthly income	26 659.0	24 436.1	2 222.8	24 399.3	26 056.7	1 657.4
Hourly income	183.8	151.7	32.1	152.2	168.6	16.4
Total household income	37 556.7	39 154.4	1 597.7	34 899.8	38 719.5	3 819.6
Salaried (%)	90.6	91.6	1.0	91.4	93.8	2.3**
Self-employed (%)	9.2	8.3	0.9	6.6	4.6	2.0**
N (Observations)	4 360	725	—	1 506	883	—

Note: * p<0.10; ** p<0.05; *** p<0.01
The table includes employed individuals between 18 and 65 who reside in Mexico's northern border municipalities and work in the United States—monetary figures in MXN as of March 2020. A two-tailed *t*-test of the means presented is performed in the "difference" columns.
Source: created by the author based on the 2000 General Population and Housing Census and the 2020 Population and Housing Census

There are important differences between commuters according to whether they are Mexican or American, particularly in their sociodemographic characteristics. Based on 2020 data and compared to their U.S. peers, Mexican cross-border workers are older (41.9 years versus 31.0 years), and a higher percentage are married or living in common-law marriage (74.0% versus 64.2%) and are heads of household (61.3% versus 44.0%). Additionally, those born in Mexico have lower levels of schooling (10.4 years versus 11.7 years), and a lower percentage have international migration experience and report having resided in the United States five years earlier (7.4% versus 25.4%). In addition, they receive a lower monthly wage (MXN 24 399.3 versus 26 056.7), even though they tend to have longer working hours (42.5 versus 40.8 hours worked per week).

What is their contribution to the wage bill of their municipalities of residence?

A first approximation of the contribution of cross-border workers to their local economies is obtained by estimating their contribution to the total wage bill. How much cross-border workers contribute to their economies of residence depends not only on the wages they earn in the United States and the characteristics of the U.S. labor markets in which they participate but also on the wages earned by workers living and working in Mexico and the characteristics of these labor markets. For example, in the case of Tijuana, while the incomes of cross-border commuters will tend to be higher than those earned in other parts of the border due to the higher wages paid in California compared to other southern U.S. states such as Arizona or Texas, it is also true that the average wage in Tijuana tends to be higher than that earned in other cities on Mexico's northern border such as San Luis Rio Colorado or Juarez.

Table 4 shows that, in 2020, the contribution of commuters to the wage bill was highest in San Luis Rio Colorado (21.6%), followed by Tijuana (10.3%) and Mexicali (6.5%). Conversely, Matamoros (3.6%), Juarez (6.1%), and Nuevo Laredo (6.1%) contributed substantially less. It is noteworthy that, except for Tijuana and Juarez, during the 2000-2020 period, the contribution of commuters to the wage bill of their municipalities decreased, which indicates a drop in the economic importance of this group. Combined, their contribution to the wage bill of the border municipalities decreased from 8.4% to 7.3% between 2000 and 2020. Alegría (1990) estimates that in 1990 cross-border workers represented about 8.0% of the region's working-age population and contributed between 14.0% and 20.0% of the wage bill. This suggests that over the last three decades, there has been a notable reduction in these workers' relative importance and contribution to the region's economy.

Because cross-border workers transit between two countries, a significant portion of their income is spent on cross-border purchases or in the United States. Therefore, to better understand the economic impact on their places of residence in Mexico, it is necessary to make this distinction. This is done in the following subsection based on ENIGH data.

Table 4. Cross-border workers by municipality and their contribution to the wage bill (%)

Municipality	2000	2010	2015	2020
Tijuana	9.99	11.42	10.97	10.29
Mexicali	13.15	6.65	6.79	6.49
San Luis Rio Colorado	26.45	17.04	22.39	21.60
Ciudad Juarez	5.65	4.11	3.67	6.10
Nuevo Laredo	6.40	3.94	6.06	6.12
Matamoros	5.04	3.27	3.39	3.60
Total	8.43	6.69	7.02	7.26

Note: contribution to the wage bill is calculated based on employed individuals aged 18 to 65. The "total" category includes all municipalities on Mexico's northern border.
Source: created by the author based on the General Population and Housing Census 2000, Population and Housing Census 2010, Intercensal Survey 2015, and Population and Housing Census 2020

What are their income and expenditures in Mexico and the United States?

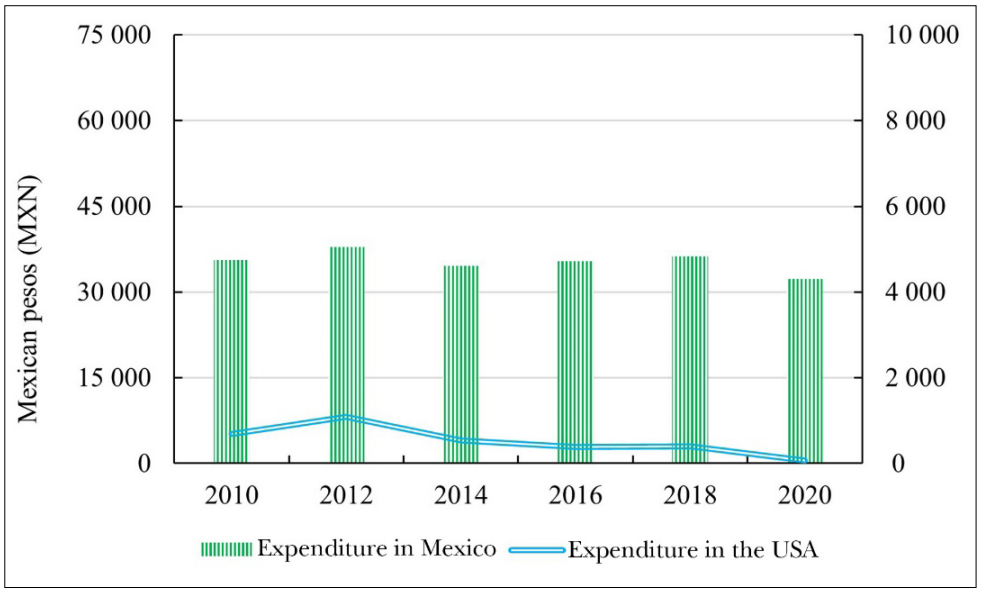
This subsection analyzes the income and expenditures of cross-border households individually and in the aggregate.

In 2020, the average quarterly income of non-cross-border households on the northern border stood at MXN 61 274.4, while among cross-border households, it amounted to MXN 156 333.4, 155.1% higher. In terms of expenditures, as shown in Figure 1, those of non-cross-border workers were practically all in Mexico (99.8%) and only 0.2% in the United States; in contrast, among cross-border workers, these figures were 93.9% and 6.1%, respectively. The low expenditure levels in the United States during 2020 are partly explained by the COVID-19 pandemic when the international border was partially closed due to the pandemic, and crossings into the United States were limited to essential travel. From 2010 to 2018, non-cross-border workers carried out between 1.1% and 2.8% of their total expenditure in the United States, while among cross-border workers, these amounts ranged between 8.3% and 12.0%. While commuters have historically spent a greater proportion on cross-border purchases in the United States, their higher salaries are also reflected in higher consumption levels in Mexico. Specifically, while the average quarterly expenditure of non-border households in Mexico is MXN 32 296.5, among cross-border households, it is MXN 64 644.1. In addition, the higher income of cross-border commuters implies that they have higher levels of savings.

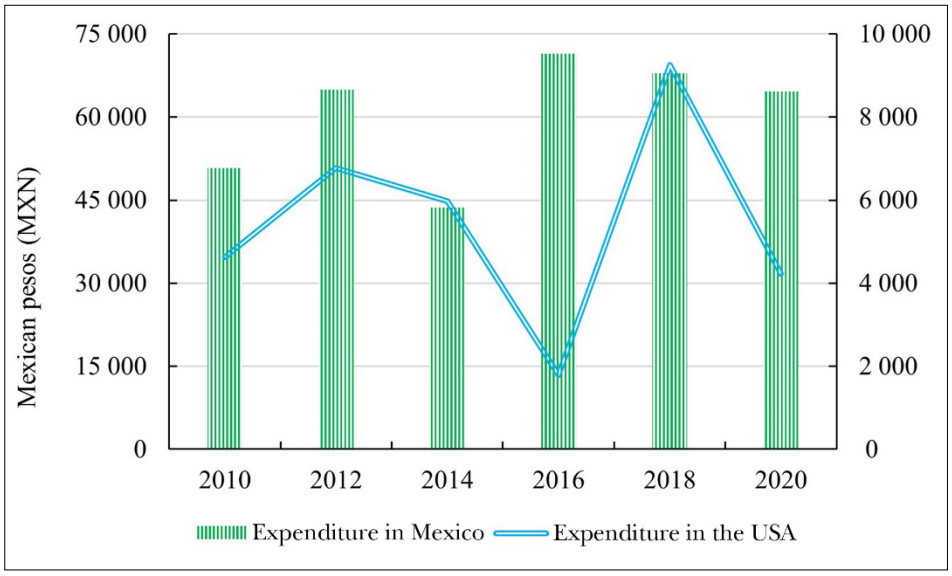
An analysis of the evolution of household income during the 2010-2020 period shows that it increased on average. In the case of expenditure, it decreased slightly among non-border households and increased among cross-border households. Likewise, while cross-border workers' expenditure levels in the United States in 2020 were similar to those observed in 2010, among non-cross-border workers, they were much lower. There are several reasons for this. First, due to the terrorist attacks of September 11, 2001, documented and undocumented entry into the United States became more difficult, and crossing times to the United States increased, which harmed cross-border purchases (Ferris, 2010). Second, the high levels of internal immigration to Mexico's northern border states over the past few decades suggest that an increasing proportion of the population does not have cross-border ties or does not have the necessary documentation to enter the United States legally. Third, due to the economic liberalization that Mexico underwent at the end of the 20th century and the entry into force of NAFTA, the variety of products sold in the country gradually increased. This led certain households that previously shopped in the United States to make a greater portion of their purchases in Mexico (Adkisson & Zimmerman, 2004; Ford et al., 2009). Fourth, the MXN-USD exchange rate depreciation during the 2010-2020 period (when it went from MXN 13.1 per USD 1.0 to MXN 18.9 per USD 1.0, equivalent to a 44.4% depreciation) may have discouraged people from making cross-border purchases and spend their money in the United States. This is consistent with Cabral et al. (2022), who show that U.S.-Mexico border crossings are sensitive to changes in the MXN-USD exchange rate. Finally, the growing anti-immigrant climate in the United States also seems to have negatively impacted the number of border crossings of Mexicans to the USA (Cabral et al., 2022; Castañeda Pérez, 2022).

Figure 1. Quarterly individual household expenditure in Mexico and the USA (MXN)

A. *Households without cross-border workers*



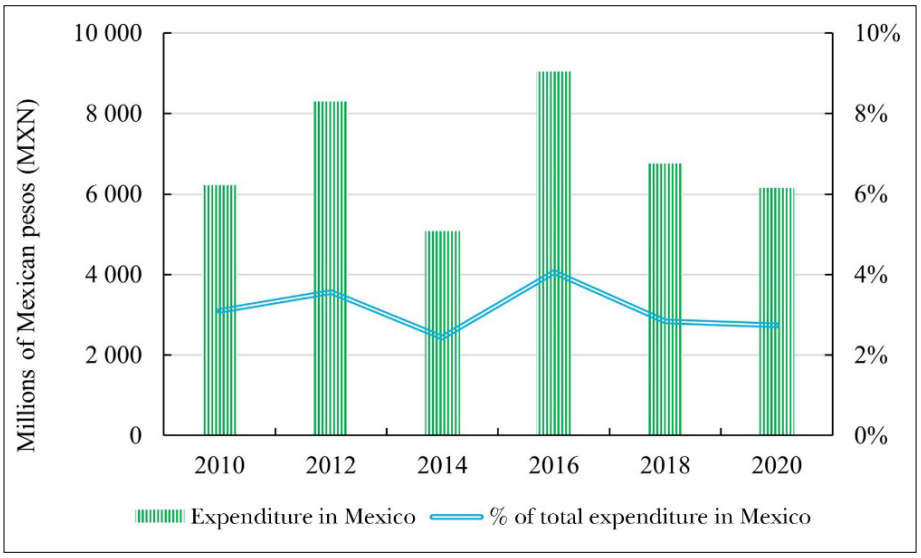
B. *Households with cross-border workers*



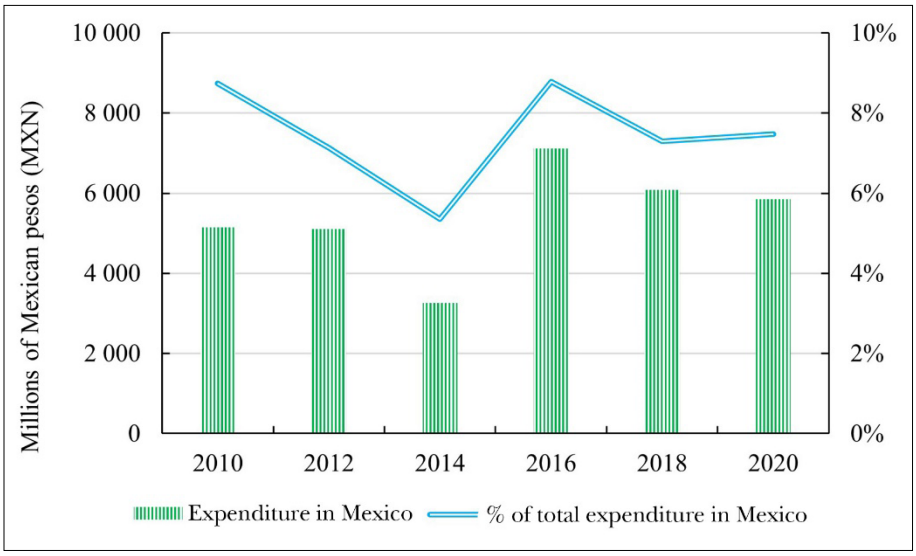
Note: the graphs include households located in Mexico's northern border states. Expenditure in the United States includes all purchases made abroad or outside Mexico. Monetary figures in MXN as of March 2020. Calculations were made using expansion factors.
Source: created by the author based on ENIGH 2010, 2012, 2014, 2016, 2018, and 2020

Figure 2. Quarterly aggregate expenditure of cross-border households in Mexico (MXN millions)

A. *Border States*



B. *Border municipalities*



Note: the graphs include households in the states and municipalities along Mexico's northern border—monetary figures in millions of MXN as of March 2020. Calculations were made using expansion factors.
Source: created by the author based on ENIGH 2010, 2012, 2014, 2016, 2018, and 2020

Figure 2 presents the evolution of aggregate quarterly expenditures made by cross-border households in northern border states and municipalities. In 2020, the total income of cross-border households in border municipalities stood at MXN 14 024.1 million. In addition, their expenditure in Mexico amounted to MXN 5 845.6 million. This represented 7.5% of total expenditure by households in the region. Likewise, their expenditure in the United States or for cross-border purchases was MXN 399.5 million. Between 2010 and 2020, cross-border households spent 7.1% and 8.8% of total expenditure in municipalities contiguous to the U.S. border.

What is the wage premium associated with cross-border work, and how is having a commuter in the household associated with expenditure levels?

This subsection presents the regression analysis results used to estimate the wage and expenditure increases associated with cross-border work.

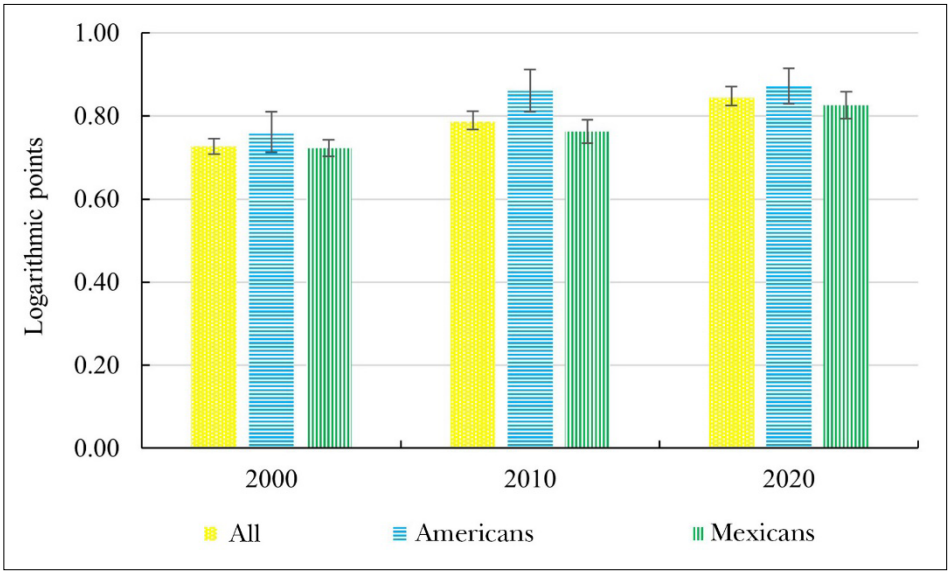
Figure 3 presents the evolution of the wage premium associated with cross-border work based on the coefficients obtained through equation (1).[5] It is observed that, in all cases, the effects are positive and highly significant ($p<0.01$). Notably, the premium for cross-border labor increased during the analysis period from 0.73 log points in 2000 to 0.79 in 2010 and 0.84 in 2020. In percentage terms, this equates to a premium associated with cross-border work of 106.9% in 2000 and 132.5% in 2020. The increase in the relative wages of commuters compared to that of their counterparts working in Mexico is partly explained by the growing wage gap between Mexico and the United States, where the gap between the average wage of the two countries has gradually increased since the economic crisis of 1995 (Calderón Villarreal et al., 2017).

When the sample is separated by country of birth, it is clear that the premium associated with being a commuter is higher among Americans than among Mexicans. For example, in 2020, among Mexicans, the premium was 0.85 log points or 128.3%, while among Americans, it rose to 0.91 log points or 139.2%. Several reasons can explain this difference. First, several studies have shown that Mexicans in the United States suffer a certain level of wage lag compared to Americans (Borjas & Katz, 2007; Orraca Romano & García Meneses, 2016). Second, while all U.S.-born people are U.S. citizens, many Mexicans are temporary residents or work with a work or tourist visa. Previous evidence indicates that in the U.S. labor market citizens earn higher wages than residents (Chiswick & Miller, 2010) and that there is also a penalty for people who work undocumented (Borjas & Cassidy, 2019). According to Velasco Ortiz (2016), cross-border workers who are not authorized to work legally in the United States tend to earn lower wages than those who work with the proper documents. Also, their jobs tend to be more unstable regarding the number of hours they work and their wages. Third, given the limitations of the census, some variables are not included in the analysis (for example, whether those born in Mexico have U.S. residency or citizenship,

[5] It was decided to present the results of the regressions estimated from equations (1) and (2) graphically, because it is considered that this facilitates the interpretation and visualization of the coefficients and marginal effects. Nevertheless, the interested reader can be provided with the results of the regressions in tables.

whether Mexican commuters work legally or illegally in the United States, levels of English language proficiency, or the country where most of their formal education was acquired) that influence wages and may explain in part why the premium for cross-border work is higher among U.S. commuters.

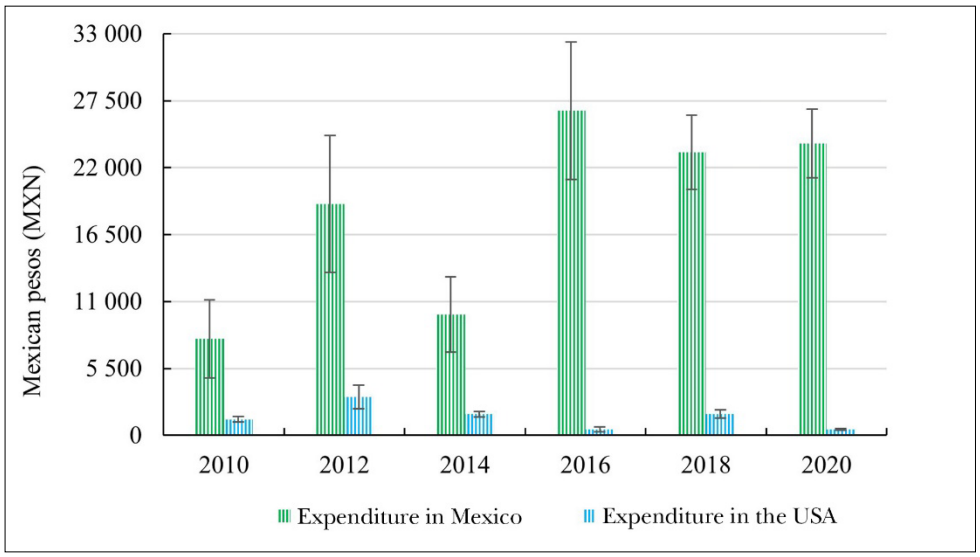
Figure 3. OLS. Wage premium associated with cross-border work



Note: the graph includes employed individuals aged 18 to 65 who report positive wages and reside in Mexico's northern border municipalities. It presents the coefficient associated with the "cross-border worker" variable obtained from equation (1). The reference group consists of employed individuals who are not cross-border workers. All coefficients are statistically significant ($p<0.01$).
Source: created by the author based on the 2000 General Population and Housing Census, 2010 Population and Housing Census, and 2020 Population and Housing Census

Figure 4 shows the unconditional marginal effects of having a cross-border worker in the household on quarterly expenditure in Mexico and the United States. It is observed that, in all years, having a commuter in the home is associated with higher expenditure in both countries ($p<0.05$). On the one hand, having a cross-border household member is associated with an expenditure in Mexico per quarter that exceeds the expenditure of other households by between MXN 7 931.9 and MXN 26 671.7; on the other hand, their expenditure in the United States exceeds that of other households by between MXN 480.5 and MXN 3 168.5 per quarter. Notably, between 2018 and 2020 the marginal effect of U.S. cross-border household expenditure declined by 72.3%. This is likely in part a product of the COVID-19 pandemic, one of whose repercussions was that many people worked remotely or from home, leading them to travel less frequently to the United States, resulting in commuters decreasing their cross-border purchases and thus the proportion of their expenditure in the United States.

Figure 4. Tobit. Quarterly expenditures in Mexico and the United States associated with cross-border labor



Note: the graph includes households located in Mexico's northern border states. Each bar represents the unconditional marginal effect associated with a Tobit model "cross-border household" variable. The reference group consists of households that do not have a cross-border worker. All coefficients are statistically significant ($p<0.05$). Expenditure in the United States includes all purchases made abroad or outside Mexico. Monetary figures in MXN as of March 2020. Calculations were done using population weights.
Source: created by the author based on ENIGH 2010, 2012, 2014, 2016, 2018 and 2020

Lastly, according to the regression analysis results, it is estimated that a 100% increase in cross-border households in the northern border states would increase annual expenditure in Mexico by at least MXN 9 290.4 million. In addition, this would also be reflected in an increase in expenditure in the United States of 707.2 million pesos.[6] This reflects the significant economic spillover generated by cross-border households, which is a positive and important component in the economic dynamics of the region, both for Mexico and the United States.

Conclusions

This study examined the socioeconomic characteristics of cross-border workers and their differences according to their country of birth. It first approximated their economic importance for their economies of residence by calculating their contribution to the wage bill and individual and aggregate household expenditure.

[6] These amounts are obtained by multiplying the number of households with cross-border workers, which according to the ENIGH in 2018 was 99 904, by the premium on expenditure incurred in Mexico and the United States associated with cross-border work, which in 2018 was MXN 23 247.9 and MXN 1 769 per quarter, respectively, times four (to annualize the figure).

It was observed that over the 2000-2020 period, the size of the commuter population increased slightly, that it is increasingly made up of Americans, and that the percentage of workers from border municipalities who are cross-border commuters decreased from 4.1% in 2000 to 2.6% in 2020. There are also significant differences in the socioeconomic characteristics of Mexican and U.S. cross-border workers, where the latter are younger on average, have more years of schooling, and have more international migration experience. Regarding their economic importance, in 2020 cross-border commuters contributed 7.3% of the wage bill of Mexico's northern border municipalities; however, this figure is lower than their contribution of 8.4% in 2000. Also, in 2020 their expenditure in Mexico amounted to MXN 5 845.6 million, which represented 7.5% of the total expenditure made by households in the region, while their expenditure in the United States was MXN 399.5 million. In aggregate, between 2010 and 2020 cross-border households spent between 7.1% and 8.8% of total expenditure in the municipalities bordering the U.S. border. Furthermore, having a cross-border worker in the household is associated with 56.8% higher expenditure in Mexico than that of households without cross-border workers. In other words, the Mexican expenditure premium associated with cross-border work is between MXN 7 931.9 and MXN 26 671.7 per quarter, while the U.S. expenditure or cross-border consumption premium is between MXN 480.5 and MXN 3 168.5 per quarter, equivalent to 283.1% more.

Since relatively few studies have analyzed commuters in the northern border region of Mexico, multiple avenues of research are yet to be addressed. For example, the high wages of cross-border commuters imply that their presence is associated with increased levels of inequality in their places of residence. Specifically, based on the 2020 Population and Housing Census, if commuters are included, wage inequality in the northern border municipalities, as measured by the Gini index, increases from 0.3655 to 0.3857, equivalent to an increase in inequality levels of 5.5%. The social and economic effects of this increased inequality merit attention. Similarly, although their high expenditure levels in Mexico are undoubtedly a positive and important component of the region's economic dynamics, as individuals with substantially higher incomes than the rest of the population, cross-border workers can generate distortions in their economies of residence. For example, based on different editions of the ENIGH from 2010 to 2020, preliminary estimates of the association between being a commuter and the monthly rent paid in Mexico show that, once controlled for several variables, this is associated with a monthly rent of MXN 1 775.3 higher than what households without cross-border commuters pay, suggesting that the impact of commuters is not only a product of their higher incomes. On the one hand, cross-border commuters may face discriminatory treatment by housing providers; on the other hand, they may value certain amenities differently from the rest of the population and therefore demand other types of products and services. If so, this may be due to the fact that cross-border workers differ from other workers regarding their observable and unobservable characteristics. The possible distortions generated by commuters and the discriminatory or preferential treatment they are subject to is an issue that deserves to be examined. Finally, cross-border labor is not limited to the northern region of Mexico. In recent years, different works such as those of Nájera-Aguirre (2020) or Rojas Pérez (2020) have focused on the cross-border labor market in the country's south. A comparative analysis of the similarities and differences of cross-border labor markets on the northern and southern borders would be invaluable.

Given the lower living costs in Mexico, being a cross-border commuter represents an effective strategy for individuals and households in the northern part of the country with the possibility of working in the United States to maximize their income and access a better standard of living. Given the high and rising housing costs in the United States, the number of commuters is also expected to increase significantly in the coming years (Kamin, 2022). This phenomenon, like many others, reflects the different economic and social linkages that are present daily in the U.S.-Mexico border region.

References

Acuña González, B. (1988, October-December). Transmigración legal en la frontera México-Estados Unidos. *Revista Mexicana de Sociología*, *50*(4), 277-322. https://doi.org/10.2307/3540592

Adkisson, R. V. & Zimmerman, L. (2004). Retail trade on the U.S.-Mexico border during the NAFTA implementation era. *Growth and Change*, *35*(1), 77-89. https://doi.org/10.1111/j.0017-4815.2004.00239.x

Alegría, T. (1990, July-December). Ciudad y transmigración en la frontera de México con Estados Unidos. *Frontera Norte*, *2*(4), 7-38. https://fronteranorte.colef.mx/index.php/fronteranorte/article/view/1626

Alegría, T. (2002). Demand and supply of Mexican cross-border workers. *Journal of Borderlands Studies*, *17*(1), 37-55. https://doi.org/10.1080/08865655.2002.9695581

Alegría Olazábal, T. (1992). *Desarrollo urbano en la frontera México-Estados Unidos. Una interpretación y algunos resultados*. Consejo Nacional para la Cultura y las Artes.

Arámburo Vizcarra, G. (1987). Commuters en la frontera México-Estados Unidos. *Estudios Fronterizos*, *5*(12-13), 81-93. https://doi.org/10.21670/ref.1987.12-13.a04

Asplund, M., Friberg, R. & Wilander, F. (2007). Demand and distance: evidence on cross-border shopping. *Journal of Public Economics*, *91*(1-2), 141-157. https://doi.org/10.1016/j.jpubeco.2006.05.006

Bleda Hernández, M. J. & Tobías Garcés, A. (2002). Aplicación de los modelos de regresión tobit en la modelización de variables epidemiológicas censuradas. *Gaceta Sanitaria*, *16*(2), 188-195. https://doi.org/10.1016/S0213-9111(02)71651-8

Borjas, G. J. & Cassidy, H. (2019). The wage penalty to undocumented immigration. *Labour Economics*, *61*, Artículo 101757. https://doi.org/10.1016/j.labeco.2019.101757

Borjas, G. J. & Katz, L. F. (2007). The evolution of the Mexican-born workforce in the United States. In G. J. Borjas (Ed.), *Mexican immigration to the United States* (pp. 13-56). University of Chicago Press.

Broersma, L., Edzes, A. & Van Dijk, J. (2022). Commuting between border regions in The Netherlands, Germany and Belgium: an explanatory model. *Journal of Borderlands Studies*, *37*(3), 551-573. https://doi.org/10.1080/08865655.2020.1810590

Cabral, R., García-Flores, F. & Saucedo, E. (2022). The influence of sentiments of economic agents on pedestrians and vehicle crossings along the US-Mexico border. *Applied Sciences*, *12*(5), 1-17. https://doi.org/10.3390/app12052512

Calderón Villarreal, C., Huesca Reynoso, L. & Ochoa Adame, G. L. (2017). Análisis comparativo de la desigualdad salarial entre México y Estados Unidos. *Investigación Económica*, *76*(300), 3-31. https://doi.org/10.1016/j.inveco.2017.02.004

Castañeda Pérez, E. (2022). Transborder (in) securities: transborder commuters' perceptions of U.S. Customs and Border Protection policing at the Mexico-U.S. border. *Politics, Groups, and Identities*, *10*(1), 1-20. https://doi.org/10.1080/21565503.2020.1748066

Chandra, A., Head, K. & Tappata, M. (2014). The economics of cross-border travel. *The Review of Economics and Statistics*, *96*(4), 648-661. https://doi.org/10.1162/REST_a_00404

Chávez, S. (2016). *Border lives: fronterizos, transnational migrants, and commuters in Tijuana*. Oxford University Press.

Chiswick, B. R. & Miller, P. W. (2010). Occupational language requirements and the value of English in the US labor market. *Journal of Population Economics*, *23*(1), 353-372. https://doi.org/10.1007/s00148-008-0230-7

Coubès, M.-L. (2008). Maquiladora or cross-border commute. The employment of members of households in five Mexican border cities. In R. R. Marquez & H. D. Romo (Eds.), *Transformations of la familia on the U.S.-Mexico border* (pp. 131-161). Notre Dame Press.

Díaz González, E. & González-König, G. (2016). Análisis de las compras de los consumidores mexicanos en Estados Unidos basado en el gasto de hogares. *Estudios Fronterizos*, *17*(33), 115-140. https://doi.org/10.21670/ref.2016.33.a05

Ericson, A.-S. (1970). The impact of commuters on the Mexican-American border area. *Monthly Labor Review*, *93*(8), 18-27. https://www.jstor.org/stable/41839773

Escala Rabadán, L. & Vega Briones, G. (2005). Living and working as cross-border commuters in the Tijuana-San Diego Region. In R. Kiy & C. Woodruff (Eds.), *The ties that bind us: Mexican migrants in San Diego County* (pp. 147-174). Center for US-Mexican Studies-UC San Diego.

Estrella Valenzuela, G. (1993). Migración internacional legal desde la frontera norte de México. *Estudios Demográficos y Urbanos*, *8*(3), 559-600. https://doi.org/10.24201/edu.v8i3.886

Ferris, J. S. (2000). The determinants of cross border shopping: implications for tax revenues and institutional change. *National Tax Journal*, *53*(4.1), 801-824. https://doi.org/10.17310/ntj.2000.4.01

Ferris, J. S. (2010, December). Quantifying non-tariff trade barriers: what difference did 9/11 make to Canadian cross-border shopping? *Canadian Public Policy*, *36*(4), 487-501. https://doi.org/10.3138/cpp.36.4.487

Ford, T. C., Logan, B. & Logan, J. (2009). NAFTA or Nada? Trade's impact on U.S. border retailers. *Growth and Change*, *40*(2), 260-286. https://doi.org/10.1111/j.1468-2257.2009.00475.x

Fullerton, T. M., Jr. & Walke, A. G. (2019). Cross-border shopping and employment patterns in the southwestern United States. *Journal of International Commerce, Economics and Policy*, *10*(3), 1-20. https://doi.org/10.1142/S1793993319500157

Gottholmseder, G. & Theurl, E. (2007). Determinants of cross-border commuting: do cross-border commuters within the household matter? *Journal of Borderlands Studies*, *22*(2), 97-112. https://doi.org/10.1080/08865655.2007.9695679

Herzog, L. A. (1990). Border commuter workers and transfrontier metropolitan structure along the United States-Mexico border. *Journal of Borderlands Studies*, *5*(2), 1-20. https://doi.org/10.1080/08865655.1990.9695393

Huber, P. & Nowotny, K. (2013). Moving across borders: who is willing to migrate or to commute? *Regional Studies*, *47*(9), 1462-1481. https://doi.org/10.1080/00343404.2011.624509

Instituto Nacional de Estadística y Geografía (Inegi). (2021). *Censo de Población y Vivienda 2020*. https://www.inegi.org.mx/programas/ccpv/2020/#Publicaciones

Kamin, D. (2022). How the path to homeownership runs through Mexico. *The New York Times*. www.nytimes.com/2022/07/25/realestate/homeownership-san-diego-tijuana-mexico.html

Kim, T.-K., Horner, M. W. & Marans, R. W. (2005). Life cycle and environmental factors in selecting residential and job locations. *Housing Studies*, *20*(3), 457-473. https://doi.org/10.1080/02673030500062335

López Estrada, S. (2020). Cuidado a través de la frontera: trayectorias transfronterizas de cuidados en la región Tijuana-San Diego. *Estudios Fronterizos*, *21*, Artículo e044. https://doi.org/10.21670/ref.2002044

Mincer, J. A. (1974). *Schooling, experience and earnings*. Columbia University Press.

Minnesota Population Center. (2020). *Integrated Public Use Microdata Series, International: Version 7.3 [dataset]***.** IPUMS. https://doi.org/10.18128/D020.V7.3

Nájera-Aguirre, J. N. (2020). Mercado de trabajo transfronterizo México-Guatemala: una construcción desde la experiencia de los trabajadores. *Estudios Fronterizos*, *21*, Artículo e055. https://doi.org/10.21670/ref.2013055

Nielsen, S. B. (2001). A simple model of commodity taxation and cross-border shopping. *The Scandinavian Journal of Economics*, *103*(4), 599-623. https://doi.org/10.1111/1467-9442.00262

Orraca Romano, P. P. (2015, January-June). Immigrants and cross-border workers in the U.S.-Mexico border region. *Frontera Norte*, *27*(53), 5-34. https://doi.org/10.17428/rfn.v27i53.97

Orraca-Romano, P. P. (2019). Cross-border earnings of Mexican workers across the us-Mexico border. *Journal of Borderlands Studies*, *34*(3), 451-469. https://doi.org/10.1080/08865655.2017.1294025

Orraca Romano, P. P. & García Meneses, E. (2016, July-December). Why are the wages of the Mexican immigrants and their descendants so low in the United States? *Estudios Económicos*, *31*(2), 305-337. https://doi.org/10.24201/ee.v31i2.19

Orraca-Romano, P. P. & Vargas-Valle, E. D. (2020). Drug-related violence and the decline in the number of Mexican cross-border workers. *Review of Development Economics*, *24*(2), 485-502. https://doi.org/10.1111/rode.12649

Patrick, J. M. & Renforth, W. (1996). The effects of the peso devaluation on cross-border retailing. *Journal of Borderlands Studies*, *11*(1), 25-41. https://doi.org/10.1080/08865655.1996.9695481

Rojas Pérez, H. S. (2020, January-June). Trabajadores fronterizos para el flujo mercantil global entre México y Centroamérica. *Corpus*, *10*(1), 1-21. https://doi.org/10.4000/corpusarchivos.3587

Ruggles, S., Flood, S., Sobek, M., Brockman, D., Cooper, G., Richards, S. & Schouweiler, M. (2023). *IPUMS USA: Version 13.0* [dataset]. IPUMS. https://doi.org/10.18128/D010.V13.0

Sarabia, H. (2016). Borderland attachments: citizenship and belonging along the U.S.-Mexico border. *Citizenship Studies*, *20*(3-4), 342-358. https://doi.org/10.1080/13621025.2016.1158352

Savage, V. H. & Blankmeyer, E. (1990). A test of purchasing power parity: Texas border retail trade and the value of the peso 1976-1987. *Journal of Borderlands Studies*, *5*(1), 67-78. https://doi.org/10.1080/08865655.1990.9695387

Spierings, B. & Van der Velde, M. (2013). Cross-border differences and unfamiliarity: shopping mobility in the Dutch-German Rhine-Waal Euroregion. *European Planning Studies*, *21*(1), 5-23. https://doi.org/10.1080/09654313.2012.716236

Tobin, J. (1958, January). Estimation of relationships for limited dependent variables. *Econometrica*, *26*(1), 24-36. https://doi.org/10.2307/1907382

U. S. Department of State. (n. d.). *Border crossing card*. https://travel.state.gov/content/travel/en/us-visas/tourism-visit/border-crossing-card.html

Vargas Valle, E. D. & Coubès, M.-L. (2017, January-June). Working and giving birth in the United States: changing strategies of transborder life in the north of Mexico. *Frontera Norte*, *29*(57), 63-88. https://doi.org/10.17428/rfn.v29i57.912

Velasco Ortiz, L. (2016, Autumn). Cross-border mobility and clandestine practices: scenarios of violence in the Mexico-United States border region. *Human Organization*, *75*(3), 269-278. https://www.researchgate.net/publication/306931290_Cross-border_Mobility_and_Clandestine_Practices_Scenarios_of_Violence_in_the_Mexico-United_States_Border_Region

White, H. (1980). A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica*, *48*(4), 817-838. https://doi.org/10.2307/1912934

Pedro P. Orraca Romano
Mexican. PhD in economics from the University of Sussex. Director of the Department of Economic Studies at El Colegio de la Frontera Norte. Research lines: labor economics, international migration, and cross-border economy. Recent publication: Orraca-Romano, P. P. & Vargas-Valle, E. D. (2020). Drug-related violence and the decline in the number of Mexican cross-border workers. *Review of Development Economics*, *24*(2), 485-502. https://doi.org/10.1111/rode.12649