

## **Banking on Remittances? How opening a bank account in the United States affects Mexican migrants sending money back to Mexico**

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Data from 154 different Mexican communities, housed within the Mexican Migration Project (MMP), is used to explore the influence of U.S. assimilation on a Mexican migrant's propensity to remit money back to Mexico. A migrant opening a U.S. bank account is employed as a proxy for assimilation. Sociodemographic, U.S. migration, and Mexican community control variables are included. It is found that a migrant opening a bank account during the last U.S. migration is associated with a reduced probability of remitting money back to Mexico, suggesting a shift in social and economic activity from Mexico to the U.S. for migrants abroad.

**Key words:** Assimilation, bank accounts, migration, remittances.

Los datos de 154 comunidades mexicanas, agrupados en el Mexican Migration Project (MMP), se utilizan para explorar la influencia de la asimilación a Estados Unidos sobre los migrantes mexicanos, tomando en cuenta su propensión a enviar remesas de vuelta a México. La apertura de una cuenta bancaria en Estados Unidos por parte de un migrante se emplea como una forma subsidiaria de asimilación. Se incluyen variables sociodemográficas, de migración a Estados Unidos y de control de las comunidades mexicanas. Los hallazgos dicen que la apertura de una cuenta bancaria por parte de un migrante durante la última ola de migración a Estados Unidos se asocia a una menor probabilidad de enviar remesas de vuelta a México, lo cual sugiere un cambio en la actividad social y económica de México hacia Estados Unidos por parte de los migrantes en el extranjero.

**Palabras clave:** Asimilación, cuentas bancarias, migración, remesas.

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## 1. Introduction

Migrant remittances, or the flow of foreign capital into low- or middle-income countries from workers abroad,<sup>1</sup> have long been central to the Mexican economy. Mexico receives the greatest amount of remittances in Latin America and fourth greatest in the world, behind India, China, and the Philippines.<sup>2</sup> Additionally, according to a report prepared for the U.S. Congress, remittances are one of the top three sources of foreign capital in Mexico, along with oil and tourism.<sup>3</sup> Virtually all remittances entering Mexico come from the United States,<sup>4</sup> mainly owing to the close physical proximity and strong economic ties between the two nations.<sup>5</sup>

Over the past twenty years, remittances to Mexico have skyrocketed, increasing by more than 800%, adjusted for inflation. In the late 1990s, the annual amount remitted was estimated to be 2 billion dollars,<sup>6</sup> while in 2016 total remittances entering Mexico equaled some 27 billion dollars.<sup>7</sup> The growth of remittances entering Mexico has not followed an uninterrupted upward slope, however, as the great global recession of 2008–2009 had far-reaching consequences, impacting international trade, migration, and monetary flows between countries.<sup>8</sup> The total amount of remittances entering Mexico dropped by over 15% in 2009 relative to the previous year,<sup>7</sup> and the average amount sent back monthly fell from \$343 in 2007 to \$329 in 2009.<sup>9</sup>

So-called “migradollars,” a term coined by Jorge Durand,<sup>10</sup> entering Mexico from the United States allow for purchases to be made by the receiving family in Mexico that were originally too expensive.<sup>11</sup> Several factors contribute towards a migrant’s propensity to remit earned funds from the U.S. back to Mexico. Most commonly cited influences include trip duration, household dependency in Mexico, and social ties.<sup>12</sup>

1. Ratha, 20–21, 2005.

2. Ratha Plaza and Dervisevic, 12, 2015.

3. Villarreal, 9, 2010.

4. de la Garza and Lowell 2002; Hernández-Coss 2005; Sana 2008.

5. Villarreal, 24, 2010.

6. Conway and Cohen, 29, 1998.

7. Banco de México 2017.

8. Fix et al., 8–9, 2009; Eaton et al., 36–37, 2011.

9. Fix et al., 84, 2009.

10. Durand 1988.

11. Massey and Parrado, 24, 1994; DeSipio, 180, 2000; Mooney, 1147–1150, 2003; Amuedo-Dorantes Bansak and Pozo, 49, 2005; Rose and Shaw, 80, 2008.

12. Massey, 677–680, 1986; Conway and Cohen, 32, 1998; DeSipio, 177, 2000; Amuedo-Dorantes Bansak and Pozo, 46, 2005; McKenzie, 123, 2006.

Previous research demonstrates that a migrant's feelings of connectivity and identification with the host country, also known as assimilation,<sup>13</sup> as compared to the sending country has direct effects on the amount of money sent back.<sup>14</sup> Some research specifies that, as time in the United States increases, remittances will decrease.<sup>15</sup> It is suggested that as the migrant assimilates into U.S. life, there is less desire to send money back to Mexico; this is referred to as "remittance decay."<sup>16</sup> In contrast, other research suggests that, as time in the United States increases, the amount remitted will *increase*. Once settled into a new country, a migrant is able to secure a better job with higher pay, and subsequently can afford to sacrifice a larger portion of income.<sup>17</sup> The impact of migrant assimilation on remittance behavior will be explored in this present research.

To operationalize "assimilation," several studies indicate that a migrant opening a bank account in the U.S. can be used as a measure of United States societal identification.<sup>18</sup> Opening a bank account is more likely for Mexican migrants who have increased time and connections in the U.S.,<sup>19</sup> and migrants use bank accounts to increase their monetary savings in the United States.<sup>20</sup> In Massey's classic study,<sup>21</sup> after 15 years of U.S. experience, the percentage of Mexican migrant farmworkers with a savings or checking account rose from 0 to 15%. Among non-agricultural Mexican migrant workers, those with a checking account rose from 11 to 15%, while those with a savings account rose from 11 to 29% after 15 years of migratory experience.

13. As outlined in John W. Berry's iconic (71–72, 1992) paper, "assimilation" refers to migrant identification with a new society, "adaptation" is typically conceptualized as a migrant making alterations to reduce friction between themselves and their new society, and "integration" specifically references migrant participation in the new society while still maintaining a degree of original ethnic identification. As this paper sought to characterize how the remittance sending behaviors of migrants are influenced by the strength of migrant connection with U.S. life, the term "assimilation" was chosen for use.

14. Massey, 677–680, 1986; Taylor, 634–635, 1987; Conway and Cohen, 40, 1998; Mooney, 1158–1159, 2003; Amuedo-Dorantes Bansak and Pozo, 46, 2005; Amuedo-Dorantes and Pozo, 239–242, 2006a.

15. Massey, 677, 1986; Amuedo-Dorantes and Pozo, 50, 2006b.

16. Massey, 677, 1986; Taylor, 635, 1987; Amuedo-Dorantes Bansak and Pozo, 46, 2005; Amuedo-Dorantes and Pozo, 50, 2006b.

17. Taylor, 634, 1987; DeSipio, 177, 2000; Mooney, 1162–1163, 2003; Amuedo-Dorantes Bansak and Pozo, 46, 2005.

18. Massey, 677, 1986; Amuedo-Dorantes Bansak and Pozo, 55, 2005.

19. Amuedo-Dorantes Bansak and Pozo, 55, 2005.

20. Chin Karkoviata and Wilcox, 5, 2010.

21. Massey, 677, 1986.

Despite the evidence of so-called “banked migrants”—those who opened a checking or savings account with a bank<sup>22</sup>—being more assimilated into United States life, a study by Osili and Paulson<sup>23</sup> found that Latino migrants were less likely than other United States immigrants to have a checking or savings account in the U.S. Only 55% of Latino immigrants reported opening a bank account, as compared to 63% of black immigrants, 78% of Asian immigrants, and 80% of white migrants. Most commonly cited reasons for lesser rates of opening bank accounts among Latino migrants are improper documentation, lack of knowledge or trust in the banking system, and insufficient funds.<sup>24</sup>

Prior studies have measured migrant assimilation by migrant economic earnings—both individual and relative to the general population, educational achievement, self-identification, social connections, and attitude towards society.<sup>25</sup> This present study is unique in that it uses a migrant opening a bank account as a proxy for social assimilation—a migrant’s feelings of connectivity and identification with the society of the host country—in the United States, and examines how this assimilation influences one’s propensity to send back remittances while abroad in the U.S. Prior studies have demonstrated that these two variables are not endogenous, as a migrant opening a bank account in a host country is largely fueled by social assimilation and length of stay,<sup>18</sup> whereas flow of migrant remittances is based on location of family settlement, community ties to the sending country, and availability of capital.<sup>26</sup> This present research sheds light on the remitting patterns of twenty-first century Mexican migrants to the United States, controlling for sociodemographic, U.S. migration, and Mexican community characteristics.

## 2. Literature review

Academic interest in the flow of remittances from the United States to Mexico has largely aligned with the complex and varied history of Mexican migration to the United States.<sup>27</sup> Migrant remittances entering Mexico concern scholars because of the substantial effects upon the Mexican economy. In 1990, the Banco de México estimated

22. Amuedo-Dorantes Bansak and Pozo, 42, 2005.

23. Osili and Paulson, A11–A12, 2009.

24. Osili and Paulson, 297–299, 2009; Chin Karkoviata and Wilcox 2010.

25. Borjas 1985; Portes and Zhou 1993.

26. Conway and Cohen, 35, 1998; DeSipio, 177, 2000; Amuedo-Dorantes Bansak and Pozo, 46, 2005.

27. Massey and Parrado, 3–6, 1994.

the total amount of money sent from the U.S. to Mexico to be 1.98 billion dollars,<sup>28</sup> which equated to roughly 78% of Mexico's foreign direct investments in 1990.<sup>29</sup> Remittances have remained critical to Mexican economic prosperity through present day. According to the World Bank, remittances accounted for 2.29% of the 2015 Mexican GDP.<sup>30</sup>

### **2.1.1 Use of remittances: household-level**

Money sent from the U.S. to Mexico allows receiving households to make purchases that were previously unaffordable.<sup>31</sup> Typically, these expenditures are categorized into consumptions or investments.<sup>32</sup> Consumption spending refers to the receiving household using remitted money in a self-benefiting manner to immediately improve the family living situation.<sup>33</sup> Examples include food, clothing, or even technology. On the other hand, investment expenditures are understood as being channeled towards improving a family's long-term success or helping the community.<sup>34</sup> Examples of such purchases are improving a child's education or starting up a business. Massey and Parrado<sup>35</sup> found that out of the total amount of migradollars flowing into productive investments, the greatest amount went towards business ventures. In fact, in the ten Mexican states with the largest prevalence of migration, over 40% of all business investments are associated with remittances.<sup>36</sup>

### **2.1.2 Use of remittances: community-level**

Households are not the only receivers of remittances, as migrants may "pool" money together in order to make larger home community projects affordable. So-called "collective remittances" are primarily used to construct soccer stadiums, repair churches, or dig wells that

28. Massey and Parrado, 5, 1994.

29. Massey and Parrado, 23, 1994.

30. The World Bank 2016.

31. Massey and Parrado, 24, 1994; DeSipio, 180, 2000; Mooney, 1147–1150, 2003; Amuedo-Dorantes Bansak and Pozo, 49, 2005; Rose and Shaw, 80, 2008.

32. Massey and Parrado, 24, 1994; Cohen, 960, 2001; Mooney, 1155, 2003; Amuedo-Dorantes and Pozo, 230, 2006a; Rose and Shaw, 85–86, 2008.

33. Massey and Parrado, 24, 1994; DeSipio, 179–180, 2000; Mooney, 1155, 2003; Amuedo-Dorantes Bansak and Pozo, 48–49, 2005; Rose and Shaw, 85, 2008.

34. Massey and Parrado, 24–25, 1994; Mooney, 1155, 2003; Rose and Shaw, 86–89, 2008.

35. Massey and Parrado, 24, 1994.

36. Woodruff and Zenteno, 5, 2001.

will profit a wide array of community members.<sup>37</sup> Investing in the originating community not only economically develops the area,<sup>38</sup> but arguably also strengthens the civil society. An additional benefit in the decision to use remittances for collective purchases is Mexico's 3-for-1 program. Under this establishment, for each peso a migrant community group provides for community projects, the federal, state, and municipal governments each contribute a peso as well.<sup>39</sup> The program places the developmental decisions in the hands of the local community, which allows some autonomy for those directly benefiting from the accumulated funds.<sup>40</sup> Additionally, the 3-for-1 program generates employment opportunities in communities as major projects require a construction labor force, and erected buildings (such as a soccer stadium) may require staff to keep the facility functional.<sup>41</sup> Between 2002 and 2005, the top three uses of 3-for-1 projects were social welfare and community services (15.66%), paving (14.60%), and urbanization (14.11%).<sup>42</sup>

## 2.2 Assimilation and remittances

Prior research has explored Mexican migrant assimilation in a new country and the possible impact on remittances.<sup>43</sup> The impact of years in the U.S. and overall migrant assimilation on remittances is difficult to measure due to ambiguous results. Some researchers argue that as migrants reside in the U.S. longer, stronger social ties in the United States will develop and migrants will lose connections with family, leading to diminishing remittances.<sup>44</sup> Evidence is provided for this claim by the finding that migrants planning on returning to Mexico will remit larger amounts than permanent United States settlers.<sup>45</sup> Massey and Parrado discovered that among return migrants, 73% reported sending remittances to Mexico, as compared to 41% of permanently settled migrants.<sup>46</sup> Furthermore,

37. Goldring, 823–824, 2004; Fox and Bada, 450, 2008.

38. Conway and Cohen, 39, 1998; Cohen, 958, 2001; Amuedo-Dorantes Bansak and Pozo, 49, 2005; Ravuri, 36, 2014.

39. Inter-American Development Bank 2012; Córdova, 3, 2013.

40. Fox and Bada, 447, 2008; Córdova, 3, 2013.

41. Córdova, 7, 2013.

42. Fox and Bada, 450, 2008.

43. Massey 1986; Taylor 1987; Conway and Cohen 1998; DeSipio 2000; Mooney 2003; Amuedo-Dorantes Bansak and Pozo 2005.

44. Massey, 670–672, 1986; Taylor, 635, 1987; Amuedo-Dorantes Bansak and Pozo, 46, 2005; Amuedo-Dorantes and Pozo, 49, 2006b.

45. Amuedo-Dorantes Bansak and Pozo, 44, 2005.

46. Massey and Parrado, 14, 1994.

Amuedo-Dorantes and Pozo found that for Mexican migrants with a spouse/partner back in Mexico, remittances do not start to decay until about 8.7 years, while a Mexican migrant with no spouse/partner in Mexico will send less money back after only 5.7 years.<sup>47</sup>

Moreover, reduced remittances may simply be due to a redistribution of family settlement. Dependents residing in Mexico greatly increase a migrant's odds of remitting money back from abroad.<sup>48</sup> DeSipio found that migrants with spouses with them in the United States were 31% less likely to remit than migrants with spouses remaining in Mexico, and migrants with children in the United States were 39% less likely to remit than migrants with children in Mexico.<sup>49</sup> Similarly, if a migrant originated from a community with a high prevalence of migration, the migrant may choose not to remit money for the simple reason that not many members of the community remain in Mexico.<sup>50</sup> These studies suggest that migrant social ties to the receiving country as compared to the sending country are a critical factor when migrants make remittance decisions.<sup>51</sup>

Conversely, other research demonstrates that as more time is spent in the U.S., better jobs and pay can be obtained, which in turn leads to greater remittances.<sup>52</sup> For example, DeSipio found that for each additional year a migrant was in the U.S., the likelihood of remitting increased by 3%.<sup>49</sup>

### 2.3 Migration, remittances, and bank accounts

Among Mexican immigrants, banked migrants are more likely to have higher incomes and longer U.S. trips as compared to the unbanked, and be young, documented, and fluent in English.<sup>19</sup> Additionally, migrants from origin communities where banks are a common institution are more likely to also have a bank in the U.S.<sup>19</sup> This evidence suggests a relationship between United States assimilation and bank accounts.<sup>53</sup> The relationship between migration, remittances, and

47. Amuedo-Dorantes and Pozo, 62, 2006b.

48. DeSipio, 169, 2000; Mooney, 1150, 2003; Amuedo-Dorantes Bansak and Pozo, 40, 2005.

49. DeSipio, 169, 2000.

50. Grieco, 246, 2004.

51. Massey, 670–672, 1986; Conway and Cohen, 35, 1998; DeSipio, 177, 2000; Mooney, 1164, 2003; Amuedo-Dorantes Bansak and Pozo, 46, 2005.

52. Taylor, 634, 1987; DeSipio, 179, 2000; Mooney, 1162–1163, 2003; Amuedo-Dorantes Bansak and Pozo, 41, 2005.

53. Massey, 677, 1986; DeSipio, 167, 2000; Amuedo-Dorantes Bansak and Pozo, 55, 2005.

bank accounts has long been recognized by migrant-sending nations. Though Mexico did not adopt the policy, Bangladesh, Pakistan, South Korea, and the Philippines all attempted to respectively boost the national economy by establishing mandatory migrant remittance pipelines through banks.<sup>54</sup>

Finally, it is important to note the trend of easier access to bank accounts for migrants in the twenty-first century, as the Mexican and United States economies continually harmonize.<sup>55</sup> Specifically, domestic banks are opening branches abroad where migrants are living, which improves migrant communication and trust with the familiar banks.<sup>56</sup> Additionally, costs of bank transfers are diminishing, and migrants may receive IDs that permit access to banking systems.<sup>56</sup> In particular, the Patriot Act of 2001 allowed Mexican migrants—including those without documentation—to obtain a *matrícula* card<sup>57</sup> and use it to open a bank account in the United States.<sup>58</sup> Because of the ease of banking in the modern era, the elevated bank activity among Mexican migrants in the U.S. may be partially due to the improved accessibility of banks to migrants; in conjuncture with United States assimilation.

This study is unique in that it examines opening a bank account while abroad, and therefore Mexican migrant assimilation into United States life, as it influences a migrant's propensity to remit money back to Mexico. Key sociodemographic, U.S. migration, and Mexican community controls that may influence a migrant's remitting patterns are also included in this analysis.

### 3. Data and methods

#### 3.1 Data

The data used in this research was drawn from the Mexican Migration Project (MMP), which is the result of a binational effort between Princeton University and the University of Guadalajara in Mexico. The dataset currently features information on 154 communities in Mexico, and new communities are added every year. Data collection

54. Wucker, 40, 2004.

55. Robertson, 61–64, 2006; Sanderson, 475, 2013.

56. Martin, 20, 2006.

57. *Matrícula* cards are ID cards issued at a Mexican Consulate that are, post-Patriot Act, accepted by most U.S. banks as a valid and sufficient form of ID when opening a bank account. The cards are notably issued without concern as to an individual's documentation status (Chin Karkoviata and Wilcox, 6, 2010).

58. Chin Karkoviata and Wilcox, 7, 2010.



began in 1982 and at the time of this analysis the set contains information for 162,293 persons, with survey data recorded through 2015. Typically 200 households are surveyed in each community and members are asked questions on a wide variety of topics including demographic information, migration history, and household composition. The communities chosen cover a vast regional and economic scale in order to get a fuller and more accurate representation of the Mexican population. An ethnosurvey approach is used in order to gather qualitative and quantitative data.<sup>59</sup>

Given that this study's aim was uncovering the remitting patterns of Mexican migrants to the U.S., the analysis focused on "Heads of Household" that have international migration experience in the United States. The MMP contains information for both past and present head of household migrants. If a head of household is still residing in the United States during the time of survey, then another household member remaining in Mexico can provide the requested information. Therefore, the migrants included in this study are not necessarily all returned from abroad. The sample size was restricted to male heads of household because Mexican males are far more likely to be considered as "Head of Household" than females; additionally males are more likely than females to make migrations to the U.S. and remit money.<sup>60</sup> Recent studies have indicated that female Mexicans are beginning to make migrations to the United States more often,<sup>61</sup> so exclusion of this small set of data from the study does present a minor limitation. The final sample size was 7,855 male household head migrants.

### 3.2 Dependent variable

The principal dependent variable was remitting money back to Mexico while on the last migration trip. Measure of remittances was treated as a binary, with a migrant responding "yes" or "no" to remitting money back to Mexico during the last United States migration.

### 3.3 Independent variable

The main independent variable of interest was opening a bank account in the U.S. during the last migration trip, which served as

59. The Mexican Migration Project.

60. Massey and Basem, 194, 1992; Kandel and Massey, 1001, 2002; Garip, 1340, 2012.

61. Cerrutti and Massey, 187, 2001; Marcelli and Cornelius, 111, 2001.

a proxy for U.S. assimilation. The last migration trip was selected for study in order to capture the most recent migrant behaviors, account for migrants who may still be residing in the United States from their latest migration, and for the simple reason that the MMP only records details of a migrant's most recent U.S. visit for many financial variables. The sociodemographic controls used were age (in years), age<sup>2</sup> (in years), education level, marital status, Mexican household dependency, and land and business ownership. Age was included because research suggests that as age increases, one's likelihood of remitting money increases as well.<sup>62</sup> The age<sup>2</sup> term considered a non-linear relationship between an individual's age and remittances sent home. For example, there may be a stronger association between age and remittances at older ages, as migrants are able to secure better paying jobs and thus have more expendable income. Additionally, prior research has demonstrated that educational attainment is directly related to how assimilated one is in a host country and the occupational opportunities that are made available, with better education leading to greater U.S. settlement and fewer remittances sent back.<sup>63</sup> The numbers of dependents remaining in Mexico were included as they are key determinants to the amount of remittances sent back. With more dependents in the sending country, the greater likelihood a migrant has of remitting money.<sup>64</sup> Finally, remittances allow for investments in land and business,<sup>65</sup> and household wealth has been shown to have an association with the amount of remittances sent back by migrants abroad.<sup>66</sup>

The control variables included in this analysis that capture characteristics of U.S. migrations were age at first U.S. migration (in years), accumulated number of U.S. migrations, duration of last U.S. migration (in months), undocumented status during the last U.S. migration, a job in agriculture during the last U.S. migration, and annual wage during the last U.S. migration (in 2015 dollars). According to Durand et al., a migrant's position in the life cycle, involvement with the United States, and monetary assets are all related to an individual's likelihood of remitting, which supports

62. Massey and Parrado, 26, 1994; Durand et al., 256, 1996; DeSipio, 169, 2000; Amuedo-Dorantes Bansak and Pozo, 40, 2005; Garip, 1349, 2012.

63. Durand et al., 257, 1996; DeSipio, 177, 2000; Amuedo-Dorantes Bansak and Pozo, 40, 2005; Garip, 1350, 2012.

64. Massey and Parrado, 26, 1994; DeSipio, 169, 2000; Amuedo-Dorantes Bansak and Pozo, 40, 2005; Garip, 1351, 2012.

65. Cohen and Rodriguez, 54, 2005; Joo, 29, 2012.

66. Garip, 1349, 2012.

the inclusion of age at first migration, number of migrations, and wage during last migration in the analysis.<sup>67</sup> Trip duration has been shown to have an association with the amount of money remitted back to Mexico, though the exact nature of this relationship is unclear. Studies have indicated that increased duration leads to either remittance decay or boosted remittances due to increases in wage and familiarity with U.S. establishments.<sup>68</sup> Additionally, legal status has a direct effect on social connections and opportunities available in the United States for a migrant, especially influencing what kind of jobs can be obtained. Prior research suggests that undocumented migrants are more likely to remit than documented migrants.<sup>69</sup> Finally, the effect of employment as an agricultural worker during the last U.S. migration was tested because numerous studies suggest that short-term migrants will travel to the United States to work in agriculture, accumulate earnings, and send money back to Mexico.<sup>70</sup>

The Mexican community characteristic controls included were proportion migrated in the community and community categories of urban (10,000 to 100,000+ inhabitants in a city setting) and rural (1 to 10,000 inhabitants in a town or farmland).<sup>58</sup> Proportion migrated in the community served as a control for how established migration is in a Mexico sending community. If migration is a customary practice, then a migrant abroad may feel pressured to upkeep a positive home-community relationship through remittances,<sup>71</sup> or alternatively most of the community members may have already migrated so a migrant would have few people to send remittances back to and would keep earnings for personal use.<sup>72</sup> Community category, or population density, was included because migrants originating out of urban communities may be more familiar with traditional "United States" establishments, such as banks, and be more likely to use them. Additionally, migrants from rural communities may be more inclined to migrate for a shorter duration, earn a target sum, and return to Mexico without making many connections in the United States.<sup>73</sup>

67. Durand et al., 250–257, 1996.

68. Massey and Parrado, 26–27, 1994; Durand et al., 258, 1996; DeSipio, 177–179, 2000; Amuedo-Dorantes Bansak and Pozo, 46, 2005.

69. DeSipio, 169, 2000; Amuedo-Dorantes Bansak and Pozo, 47, 2005.

70. Taylor, 626, 1987; Massey and Parrado, 26, 1994; Cohen, 958, 2001.

71. Garip, 1351–1353, 2012.

72. Grieco, 246, 2004.

73. Durand et al., 255, 1996; Lindstrom, 358–360, 1996.

### 3.4 Analytic strategy

Since the binary dependent variable—remitting money back to Mexico on the last U.S. migration—was highly prevalent, log-binomial regression was selected as the method of analysis because logistic regression would overestimate the effect size of regression coefficients.<sup>74</sup> Log-binomial regression is a method for modeling the relationship between independent variables and a binary dependent variable. The model is similar in concept to the more-common logistic regression model. Log-binomial regression models, however, are more robust to data where the prevalence of the outcome is not rare and provide more-intuitive estimates of probability (as opposed to estimates of odds, which are given in logistic regression). Regression coefficients represent the modeled relationship between independent variables and a dependent variable. They are typically exponentiated and interpreted as ratios, where for a binary independent variable, they can be interpreted as the likelihood of an individual with a certain characteristic having the outcome of interest divided by the likelihood of an individual without that characteristic having the outcome of interest. When used in cross-sectional studies, such as the MMP, log-binomial regression estimates the prevalence ratio, which in the context of this study is the prevalence (probability) of migrants remitting money back to Mexico during their last U.S. migration given a certain characteristic(s)—say, opening a bank account on the last U.S. migration—relative to migrants without that characteristic. The formula for this regression model is given in the footnote below.<sup>75</sup>

One issue with log-binomial regression, however, is that these models may fail to converge when the maximum likelihood estimate cannot be found.<sup>76</sup> In this case, Poisson regression with robust variance can be used as an approximation to log-binomial regression models. Poisson regression modeling utilizes the Poisson distribution (as opposed to the binomial distribution, used in logistic and log-binomial regression models). Poisson regression is traditionally used when the outcome variable represents a count, however these models can be used with binary outcome variables if robust variance

74. Barros and Hirakata, 2, 2003.

75. The log-binomial regression model can be represented by:  $\ln(\pi) = \beta_0 + \beta_1 X_1 + \dots + \beta_k X_k$ , where  $\pi$  is the probability of success of a binary response variable (in this case a migrant remitting money back to Mexico),  $\beta_0$  is the y-intercept,  $\beta_k$  are the regression coefficients, and  $X_k$  are the predictor variables. The prevalence ratio is obtained by exponentiating a given regression coefficient (Barros and Hirakata, 3, 2003).

76. Barros and Hirakata, 3, 2003.

estimates are employed. Variance refers to how different an outcome variable is from the modeled (estimated) values of that outcome variable. Robust variance estimates are obtained through a strategy of calculating variance that provides more accurate estimates than the classical method when unconventional patterns exist in the data, such as non-constant variance across different levels of an independent variable, or clustering (i.e. data collected in different communities). This methodology was implemented in the present study, accounting for clustering within communities with cluster robust variance, to estimate adjusted prevalence ratios and 95% confidence intervals for Models 1–3, presented in Table 2. Finally, multiple imputation with chained equations was used to fill in missing values for regression modeling.<sup>77</sup> Potential multicollinearity between predictor variables was explored by calculating variance inflation factors.

A strategy of progressive adjustment was utilized in the creation of the models in order to facilitate the illumination of trends and patterns in the data. In sociological research, progressive adjustment is used to explore predictor variables across multiple levels. This allows for observation of the effect of intermediary predictor variables on the strength of association between the main independent variable (migrant opening a bank account while in the U.S.) and the primary response variable (remittance money sent back to Mexico).<sup>78</sup>

Table 1 presents descriptive statistical results for the data. In Table 2 prevalence ratios are given, depicting the relationship between the independent variable (opening a bank account during the last U.S. migration), and the dependent variable of remitting money back to Mexico. The first column of Table 2 displays crude prevalence ratios of the relationship between remitting and each predictor variable included in this analysis, unadjusted for other variables. Model 1 reports the prevalence ratio of remitting based on if a migrant opened a bank account on the last U.S. migration, adjusted for sociodemographic control variables. Model 2 keeps the variables already in Model 1, and adds in control variables capturing details of U.S. migrations. Finally, Model 3 analyzes the probability a migrant remitted based on opening of a bank account, sociodemographic, U.S. migration, and Mexican community characteristic controls. All analyses were performed in Stata 14.2 (StataCorp LP: College Station, TX).

77. Rubin 2004.

78. Mirowsky, 144–151, 2013.

#### 4. Results

Table 1 presents descriptive analysis between remitters and non-remitters. The results demonstrate that only 11.82% of remitters opened a bank account during the last United States migration, while 24.83% of non-remitters opened a bank account during the last migration, providing descriptive evidence for remittance decay and family relocation.<sup>79</sup>

The mean ages for remitters and non-remitters are close, being 44.94 and 46.19 years old, respectively. The lower mean age of remitters as compared to non-remitters is surprising given that so much prior research suggests that the propensity and amount of remittances increases with age.<sup>80</sup> Additionally, in general, remitters have lower educational attainment than non-remitters, as 73.20% of remitters have only completed education up through *Primaria* (traditionally completed at age 12) or less, and only 9.86% have completed *Preparatoria* (finished at age 18) or continued further. 65.31% of non-remitters have completed a maximum of *Primaria*, and 17.34% have finished *Preparatoria* or more.

There is descriptive evidence that household dependency is associated with sending remittances. A greater percentage of remitters reported to being married (95.70%) than non-remitters (93.97%), while a larger proportion of non-remitters were recorded as never married (2.44%) or divorced or separated (2.26%) relative to remitters (1.69% and 1.07%), respectively. Furthermore, remitters have a greater mean number of children in the household and elderly dependents (defined as the parents or parents-in-law of a male household head migrant) located in Mexico, than non-remitters. Finally, a greater proportion of remitters have a spouse residing in Mexico, at 89.78%, than non-remitters (75.58%).

Examining the variables capturing characteristics of U.S. migrations, remitters have a greater mean age of first U.S. migration, and statistically insignificantly greater mean number of U.S. migrations. Remitters have a mean United States trip duration that is nearly half that of non-remitters, and a greater proportion of remitters were undocumented and worked in agriculture during the last trip relative to non-remitters. Remitters also have a statistically significantly smaller mean annual income during their last U.S. migration compared to non-remitters.

79. Amuedo-Dorantes Bansak and Pozo, 46, 2005.

80. Massey and Parrado, 26–27, 1994; Durand et al., 256, 1996; DeSipio, 169, 2000; Amuedo-Dorantes Bansak and Pozo, 40, 2005; Garip, 1349, 2012.

**Table 1.** Descriptive characteristics of male household head migrants by remittance status of last U.S. migration.

<b>Variable</b>	<b>Remitters</b>	<b>Non-Remitters</b>	<b>P-value*</b>
<u>Independent variable</u>			
<i>Opened bank account on last U.S. migration (%)</i>	11.82	24.83	<0.001
<u>Sociodemographic controls</u>			
<i>Age, in years (mean)</i>	44.94 (SD 14.42)	46.19 (SD 15.36)	0.002
<i>Age<sup>2</sup>, in years (mean)</i>	2227.86 (SD 1434.73)	2369.03 (SD 1561.16)	<0.001
<i>Education</i>			<0.001
<i>Primaria or less (%)</i>	73.20	65.31	
<i>Secundaria (%)</i>	16.84	17.00	
<i>Preparatoria or more (%)</i>	9.86	17.34	
<i>Marital status</i>			<0.001
<i>Never married (%)</i>	1.69	2.44	
<i>Married or union (%)</i>	95.70	93.97	
<i>Widowed (%)</i>	1.49	1.28	
<i>Divorced or separated (%)</i>	1.07	2.26	
<i>Household dependency</i>			
<i>Spouse is residing in Mexico (%)</i>	89.78	75.58	<0.001
<i>Number of sons in the Mexican household (mean)</i>	1.41 (SD 1.36)	1.20 (SD 1.22)	<0.001
<i>Number of daughters in the Mexican household (mean)</i>	1.37 (SD 1.34)	1.15 (SD 1.21)	<0.001
<i>Number of elderly dependents located in Mexico (mean)</i>	2.95 (SD 1.04)	2.66 (SD 1.08)	<0.001

(continued)

TABLE 1. (continued)

Variable	Remitters	Non-Remitters	P-value*
<i>Owner of land in Mexico or the U.S. (%)</i>	25.39	19.26	<0.001
<i>Owner of a business in Mexico or the U.S. (%)</i>	23.65	25.87	0.019
<u>U.S. migration controls</u>			
<i>Age at first U.S. migration, in years (mean)</i>	25.53 (SD 8.58)	23.73 (SD 8.73)	<0.001
<i>Accumulated number of U.S. migrations (mean)</i>	3.66 (SD 4.58)	3.46 (SD 5.37)	0.125
<i>Duration of last U.S. migration, in months (mean)</i>	34.04 (SD 63.49)	62.78 (SD 99.06)	<0.001
<i>Undocumented during last U.S. migration (%)</i>	66.46	52.67	<0.001
<i>Worked in agriculture during last U.S. migration (%)</i>	32.45	30.16	<0.001
<i>Annual wage during last U.S. migration, in 2015 \$ (mean)</i>	17310.76 (SD 11881.75)	18466.80 (SD 15709.21)	0.006
<u>Mexican community controls</u>			
<i>Prevalence ratio ever migrated in community (mean)</i>	25.96 (SD 14.61)	26.25 (SD 14.45)	0.479
<i>Community category (urban = 1) (%)</i>	36.92	46.64	<0.001
Number of observations	5041	1724	

Source: Mexican Migration Project. Commun154, House154, Mig154, Pers154, and Prevrat10154 files.

\* P-values calculated with t-tests for continuous variables and Pearson's chi-squared tests for categorical variables.



**Table 2.** Prevalence ratios of male household head remitting during last U.S. migration.

Variable [95% CI]	Crude Remit	Model 1 Remit	Model 2 Remit	Model 3 Remit
<u>Independent variable</u>				
<i>Opened bank account on last U.S. migration</i> (did not)	0.76*** [0.70, 0.85]	0.87** [0.80, 0.95]	0.90** [0.84, 0.97]	0.90** [0.84, 0.97]
<u>Sociodemographic controls</u>				
<i>Age, in years</i>	0.99** [0.99, 0.99]	0.99 [0.99, 1.00]	0.99 [0.99, 1.00]	0.99 [0.99, 1.00]
<i>Age<sup>2</sup>, in years</i>	0.99** [0.99, 0.99]	0.99 [0.99, 1.00]	1.00 [0.99, 1.00]	1.00 [0.99, 1.00]
<i>Education (primaria or less)</i>				
Secundaria	0.97 [0.93, 1.02]	0.95** [0.91, 0.99]	0.96* [0.92, 0.99]	0.96* [0.92, 0.99]
Preparatoria or more	0.82*** [0.77, 0.88]	0.84*** [0.79, 0.90]	0.86*** [0.81, 0.91]	0.87*** [0.82, 0.92]
<i>Marital status (never married)</i>				
Married or union	1.13 [0.99, 1.29]	0.95 [0.65, 1.38]	0.95 [0.69, 1.32]	0.95 [0.69, 1.31]
Widowed	1.17* [1.00, 1.36]	1.16 [0.76, 1.79]	1.15 [0.79, 1.68]	1.15 [0.79, 1.67]
Divorced or separated	0.88 [0.72, 1.06]	0.82 [0.56, 1.19]	0.84 [0.61, 1.16]	0.84 [0.61, 1.16]
<i>Household dependency</i>				
Spouse is residing in Mexico (is not)	1.54*** [1.35, 1.76]	1.42*** [1.26, 1.61]	1.36*** [1.20, 1.53]	1.35*** [1.20, 1.52]
Number of sons in the Mexican household	0.00 [0.00, 9999.99]	1.01** [1.00, 1.02]	1.01* [1.00, 1.02]	1.01* [1.00, 1.02]
Number of daughters in the Mexican household	1.03*** [1.02, 1.04]	1.02*** [1.01, 1.03]	1.02** [1.01, 1.03]	1.02** [1.01, 1.03]
Number of elderly dependents located in Mexico	1.07*** [1.04, 1.09]	1.07*** [1.05, 1.09]	1.07*** [1.05, 1.09]	1.07*** [1.05, 1.10]
<i>Owner of land in Mexico or the U.S.</i> (is not)	1.09*** [1.05, 1.13]	1.08*** [1.04, 1.13]	1.08*** [1.04, 1.12]	1.06** [1.02, 1.11]
<i>Owner of a business in Mexico or the U.S.</i> (is not)	0.96 [0.93, 1.00]	0.96* [0.93, 0.99]	0.97* [0.93, 0.99]	0.97 [0.93, 1.00]

(continued)

TABLE 2. (continued)

Variable [95% CI]	Crude Remit	Model 1 Remit	Model 2 Remit	Model 3 Remit
<u>U.S. migration controls</u>				
<i>Age at first U.S. migration, in years</i>	0.29 [0.00, 3085.52]		1.00*** [1.00, 1.01]	1.00*** [1.00, 1.01]
<i>Accumulated number of U.S. migrations</i>	1.00 [0.99, 1.01]		1.01 [0.99, 1.02]	1.01 [0.99, 1.02]
<i>Duration of last U.S. migration, in months</i>	0.99*** [0.99, 0.99]		0.99*** [0.99, 0.99]	0.99*** [0.99, 0.99]
<i>Undocumented during last U.S. migration (was not)</i>	1.16*** [1.11, 1.22]		1.08*** [1.04, 1.12]	1.08*** [1.04, 1.12]
<i>Worked in agriculture during last U.S. migration (did not)</i>	1.02 [0.98, 1.06]		1.00 [0.97, 1.03]	1.00 [0.96, 1.03]
<i>Annual wage during last U.S. migration, in 2015 \$</i>	0.99 [0.99, 1.00]		1.00** [1.00, 1.00]	1.00** [1.00, 1.00]
<u>Mexican community controls</u>				
<i>Prevalence ratio ever migrated in community</i>	0.99 [0.99, 1.00]			1.00 [0.99, 1.00]
<i>Urban community (rural)</i>	0.90*** [0.85, 0.96]			0.95* [0.91, 0.99]
Number of observations: 7855				

Source: Mexican Migration Project. Commu154, House154, Mig154, Pers154, and Prevratio154 files.

\*=p<0.05, \*\*=p<0.01, and \*\*\*=p<0.001

Finally, a smaller percentage of remitters originated from an urban community (36.92%), relative to non-remitters (46.64%). Community migration prevalence is quite similar for remitters and non-remitters, and the difference between mean values is statistically insignificant.

Table 2 displays prevalence ratios of a migrant remitting money back to Mexico. Opening a bank account during the last United States migration remains statistically significant throughout all models as it relates to a migrant's propensity to remit money. The probability of a migrant remitting increases as more variables are added to the regression equation, however even in the final model controlling for sociodemographic, U.S. migration, and Mexican community characteristic variables, a migrant with a bank account has a 10% lower probability of remitting money back to Mexico compared to a migrant who did not open a bank account on the last U.S. migration. This result agrees with studies indicating that opening a bank account in the U.S. accompanies assimilation and time spent abroad,<sup>81</sup> both of which lead to decaying remittances for migrants.<sup>82</sup>

Migrant age and marital status do not appear to have much of an influence on the probability of remitting back to Mexico. On the other hand, education retains statistical significance throughout all models it is included in, with greater education being associated with reduced probability of remitting money to Mexico. These results support the verdicts of prior research, as a better education allows a migrant to become well assimilated in a receiving country, acquire a prestigious job, and provides a migrant less initiative to send money back to Mexico.<sup>83</sup> Another potential explanation for this observed trend is that educated migrants originate from smaller, urban, and more educated communities that are less reliant on money coming in from abroad, though this hypothesis has yet to be thoroughly tested and could serve as the subject for another study.

All Mexican household dependency control variables included in the regression models have a statistically significant positive association with the probability of a migrant remitting money back to Mexico while on the last U.S. migration, supporting the results of previous literature that household dependents in the sending country

81. Massey, 677, 1986; DeSipio, 178, 2000; Amuedo-Dorantes Bansak and Pozo, 55, 2005.

82. Massey, 676–680, 1986; Taylor, 634, 1987; Amuedo-Dorantes Bansak and Pozo, 46, 2005.

83. Durand et al., 257, 1996; DeSipio, 177, 2000; Amuedo-Dorantes Bansak and Pozo, 40, 2005; Garip, 1349–1350, 2012.

encourage migrants to remit money back.<sup>84</sup> The largest household dependency effect estimate across all models is for spouse residing in Mexico, with a migrant who has a spouse living in Mexico having a 35% greater probability of remitting money to Mexico than a migrant without a spouse living in Mexico, in Model 3.

Interestingly, owning land remains statistically significant across all regression models, while owning a business does not. In Model 3, a migrant who owns land has a probability of remitting on the last U.S. migration that is 1.06 times that of a migrant without land. Owning a business is statistically significant in Models 1 and 2, and in both models owning a business is associated with a reduced probability of remitting on the last U.S. migration.

Most U.S. migration control variables have statistically significant adjusted prevalence ratios, however the effect estimates are essentially null, indicating that these variables do not impact the probability of a migrant remitting money back to Mexico. The near-null results for age at first migration and duration of last U.S. migration should not come as much of a surprise. These results are indicative of the contradictory reports in the literature surrounding trip duration: some studies found remittances decreased with increased trip duration due to United States assimilation, while other studies demonstrated that remittances increased as trip duration increased due to better pay as migration experience grew.<sup>85</sup> The U.S. migration control variable with the largest effect estimate is for if a migrant was undocumented during their last U.S. migration. In the most inclusive model, undocumented migrants have a probability of remitting money to Mexico that is 1.08 times that of migrants with legal documentation. This result implies United States settlement and diminished remittances for those who are legal and more assimilated.<sup>86</sup>

Finally, out of the Mexican community characteristic controls, only community category is statistically significant when included in the most comprehensive model. Migrants originating from an urban Mexican community have a 5% lower prevalence of remitting money as compared to migrants from a rural Mexican community. This result agrees with the postulation that migrants from more

84. Massey and Parrado, 26–27, 1994; DeSipio, 178, 2000; Amuedo-Dorantes Bansak and Pozo, 40, 2005; Garip, 1349, 2012.

85. Massey and Parrado, 26–27, 1994; Durand et al., 258, 1996; DeSipio, 177–178, 2000; Amuedo-Dorantes Bansak and Pozo, 47, 2005.

86. DeSipio, 169, 2000; Amuedo-Dorantes Bansak and Pozo, 47, 2005; Garip, 1350, 2012.

developed areas in Mexico are better familiarized with certain establishments in the U.S., such as banks, and more likely to utilize such resources.<sup>87</sup>

## 5. Discussion

Based upon these results, there is evidence that opening a bank account during the last U.S. migration is associated with a lower probability of Mexicans remitting money while abroad. Using opening a bank account as a proxy for United States assimilation, this suggests that as a Mexican migrant becomes connected to a receiving country and develops social ties and an understanding of the social establishments in place (such as banks), permanent settlement becomes a more viable option and remittances sent back diminish.<sup>88</sup> In fact, after 15 years of U.S. experience a migrant will shift from remitting a majority of disposable income back to Mexico to spending 65% of it in the United States.<sup>89</sup> Furthermore, modern technology and the continual globalization of societies have an influence on national economies and the economic behaviors of individuals. Notably, globalization has spurred the development of international bank branches and considerably easier bank account access for migrants.<sup>90</sup> The ease of admittance migrants have to modern institutions (for example, banks) may support foreign settlement of migrants and thus, fewer remittances sent back.<sup>91</sup> This line of research can be further explored with future studies.

The above results regarding remittance sending have real-world consequences. Prior literature has shown that migration offers the only opportunity for economic advancement to some Mexican families—especially those in agriculturally dominated communities.<sup>92</sup> These migrant households can become reliant on worker remittances,<sup>93</sup> and if the money flow from abroad diminishes for these remittance-dependent Mexican households, family members remaining back in Mexico may suffer.<sup>94</sup> A decline in the remittance

87. Amuedo-Dorantes Bansak and Pozo, 55–56, 2005.

88. Massey, 670–672, 1986; Taylor, 634, 1987; Amuedo-Dorantes Bansak and Pozo, 46, 2005; Amuedo-Dorantes and Pozo, 57, 2006b.

89. Massey, 679, 1986.

90. Martin, 20, 2006; Chin Karkoviata and Wilcox 2010.

91. Massey, 677, 1986; Amuedo-Dorantes Bansak and Pozo, 55, 2005; Amuedo-Dorantes and Pozo, 57, 2006b.

92. Rose and Shaw, 85–86, 2008.

93. Cohen, 955, 2001; Kapur, 13–14, 2003; Rose and Shaw, 85, 2008.

94. Rose and Shaw, 85, 2008; Garip, 1351–1353, 2012.

flow can influence the Mexican economy as well. For instance, Tajikistan faced economic hardships during the great global recession of 2008–2009 when remittances from Russia abated.<sup>95</sup>

Diminishing remittances is an unfortunate reality for the Mexican economy and many remittance-reliant households in Mexico. Beyond settled migrants sending fewer remittances back to Mexico, contemporary reports are documenting a negative net flow of Mexican migrants to the U.S., as more migrants are now returning to Mexico than entering the United States,<sup>96</sup> and this situation is only exacerbated with the recent change in U.S. governmental administration. A study conducted by the Pew Research Center reported that over half of undocumented Latino migrants, and 49% of legal Latino migrants, are seriously concerned about their place in the U.S. following the election of Trump.<sup>97</sup> Furthermore, this same study found that among undocumented migrants, 42% believe their situation in the U.S. has gotten worse in the past year, compared to 26% of legal migrants who answered in the same fashion.<sup>96</sup> These well-founded sentiments among migrants, combined with expanded deportation efforts under Trump, will contribute to a spike in Mexico return migration, resulting in a decline of remittances sent back to Mexico that will impact the Mexican economy, communities, and families counting on money flowing in from abroad.

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95. Danzer and Ivaschenko, 190, 2010.

96. Gonzalez-Barrera 2015.

97. Pew Research Center 2017.

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