



Assessing the Effect of Increased Deportations on Mexican Migrants' Remittances and Savings Brought Home

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Abstract

Beginning in the 1990s and intensifying after the events of September 11, deportations in the United States increased to record levels under President Obama and continued at high levels under President Trump. Although a growing literature addresses how migrants respond to the shifting context of reception, empirical evidence on how migrants' remitting and saving behavior changed as a result of immigration enforcement remains limited. Using detailed individual-level data from the Mexican Migration Project (MMP, $N=6787$) for the years 1970–2019, this study examines how deportations relate to Mexican migrants' joint decisions to remit and/or save, and how this relationship differs by documentation status. Results from multinomial logistic regressions reveal that rising deportations are associated with an increase in the transnational economic engagement of undocumented migrants. This is largely due to an increase in remittances; savings brought back decrease with rising deportations, likely because keeping savings in the United States is riskier than sending money back directly. Among documented migrants, the remitting and saving behavior does not appear to change as deportations rise. Analyzing these behaviors together is important to gain a more complete understanding of migrants' transnational economic ties and links to the country of destination.

Keywords Remittances · Savings · Deportations · Immigration enforcement · Transnational activities

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Introduction

There has been a marked increase in deportations in North America and Europe in recent decades. In the United States, for example, noncitizen removals averaged just 21,212 annually from 1970 to 1990, but increased 17 times from 1990 to 2013, going from 25,228 to 432,281. Although deportations fell somewhat during the second Obama administration, they rose again under Trump and in 2019 totaled 348,468. Many other countries, including Canada, the United Kingdom, France, Germany, and the Netherlands, have also increasingly started using deportation to deal with undocumented migrants, failed asylum seekers, noncitizens convicted of criminal offenses, and those suspected of involvement in terrorism (Anderson et al., 2011). This development has been described as the *deportation turn*, in which democratic countries increasingly rely on deportation to address immigration and security issues (Gibney, 2008).

This increase in deportations has influenced the context that migrants inhabit and how they engage with the surrounding society. Prior studies reveal that migrants, especially those without documents, increasingly live in fear, with rising distrust of the police and other legal authorities (Armenta, 2017; Cervantes et al., 2018; Flores, 2015, 2017; Licona & Maldonado, 2014). Here and throughout the paper, we define undocumented migrants as persons who have entered the United States by crossing the Mexico–U.S. border without inspection, entered using false documents, or violated the terms of a visitor visa by working or staying longer than authorized. Documented migrants, in contrast, hold U.S. citizenship or a valid visa granting the right to live and work in the United States. Studies show that apprehensions, family separations, and reports of physical and verbal abuse towards undocumented migrants have increased more in U.S. states that enacted anti-immigrant legislation than in other states (Amuedo-Dorantes & Pozo, 2014). Deportation also increases migrants' stress and has a detrimental impact on health and birth weights (Alif et al., 2020; Juárez et al., 2019; Nichols et al., 2018; Wang & Kaushal, 2019).

Although the literature on migrant remittances is large (for reviews see Hagen-Zanker & Siegel, 2007; Taylor & Castelhana, 2016; Yang, 2011), research on the effect of deportations on remitting is limited. We know of only two studies analyzing the effect of heightened internal enforcement on remittances. Amuedo-Dorantes and Puttitanun (2014) exploited temporal and geographic variation in when specific enforcement policies were implemented in different states to study changes in migrant behavior. They found that 287(g) agreements and the Secure Communities program prompted different responses in the remittance behavior of documented and undocumented migrants, with legal migrants remitting more money home to offset reductions in remittance payments from their undocumented counterparts. In their study, Vaira-Lucero, Nahm, and Tani (2012) showed that after 1996 when legislation accelerating deportations was first passed, amounts remitted by Mexican migrants increased and the increase was significantly greater for the undocumented.

Neither of these studies considered how changes in the *prevalence* of deportations might influence remittance decisions. They only assessed whether the

existence of deportation-inducing programs changed remitting behavior in the years following their introduction. Moreover, neither study considered how savings decisions might have interacted with remitting decisions as alternative means of repatriating migrant earnings. Here we study the number of deportations and assess how they relate to saving and remitting outcomes simultaneously.

Changes in remittance and saving patterns (i.e., transnational economic ties) carry important implications for economic growth and development in Mexico, since U.S. earnings constitute a key source of the nation's foreign exchange (Mora-Rivera & van Gameren, 2021; Taylor et al., 1996). Although the link between transnational ties and integration is complex (Roberts et al., 1999; Tsuda, 2012), changes in remitting and saving behaviors likely result from the perceived need to self-insure against the risk of deportation, yielding lower levels of integration in the host country. Remittance and saving behaviors thus indicate the extent of migrants' investment in both their home and destination countries. Considering that more than half of all Mexican migrants in the United States are unauthorized and thus under direct threat of deportation, questions about their and their children's livelihood have become contentious issues in a politically divided America (Abrejano & Hajnal, 2015; Bean et al., 2015). Studying how migrant remittances and savings respond to increased deportations allows us to investigate the ways in which deportations shape migrants' transnational economic ties and social integration at home and abroad.

Using data from the Mexican Migration Project (MMP) for the years 1970–2019, we analyze remittances and savings that migrants report having sent on their last trip to the United States. We conceptualize migrant decision-making as a choice between four options: saving only, remitting only, both remitting and saving, and neither remitting nor saving (the reference category). In particular, we include the number of deportations as an independent variable in multinomial logistic regression models estimated to predict the four alternative behaviors. Following Amuedo-Dorantes and Puttitanun (2014) as well as Vaira-Lucero, Nahm, and Tani (2012), we argue that as deportations rise Mexican migrants become more likely to remit. We further hypothesize that rising deportations will decrease the likelihood of saving as well as the likelihood of both remitting and saving. Given that most migrants are unbanked, especially the undocumented, rising exposure to arrest and removal puts savings accumulated in the United States at significant risk (Amuedo-Dorantes & Bansak, 2006).

Considering that the four alternative behaviors are expected to respond differently to immigration enforcement, analyzing them together allows us to get a more complete understanding of how deportations impact migrants' transnational economic ties and links to the country of destination. In the ensuing sections we describe recent developments in U.S. immigration enforcement efforts. We then review the theoretical and empirical literature to specify statistical models that connect deportations to remitting and saving decisions. After describing our data and methods, we estimate predictive models to quantify the effect of rising deportations on migrant behavior with respect to these outcomes and conclude with a summary of our results and a consideration of their practical and theoretical implications.

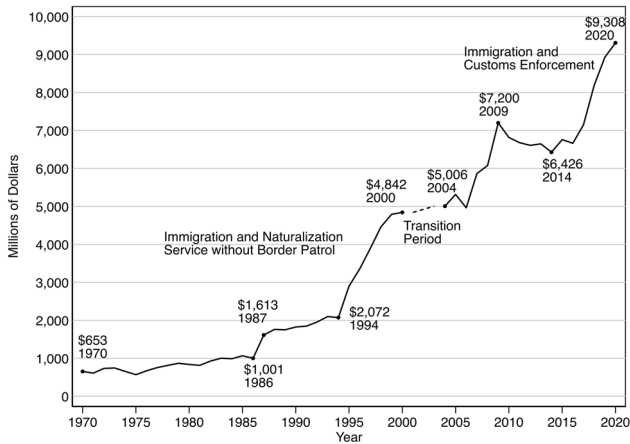


Fig. 1 Budgets for border and internal immigration enforcement 1970–2020 (millions of 2020 U.S. dollars), obtained from the Mexican Migration Project (MMP)

Trends in Immigration Enforcement

When the Immigration Reform and Control Act (IRCA) was passed in 1986, it marked the beginning of a new era of anti-immigrant enforcement. IRCA for the first time criminalized the hiring of unauthorized workers and imposed sanctions on employers who knowingly did so, while at the same time increasing funds for both internal and border enforcement (Meissner et al., 2013). The federal agency responsible for deportations from within the United States is presently Immigration and Customs Enforcement (ICE) within the Department of Homeland Security. The DHS was created in 2003 following the terrorist attacks of September 11, 2001, and until then deportations were carried out by the Immigration and Naturalization Service (INS) within the Department of Justice. From 1970 to 2000, we therefore proxy the deportations budget by subtracting the Border Patrol budget from the total INS budget (as Border Patrol was then part of the INS) in Fig. 1. Then after a short transition period, we show the budget for ICE from 2004 through 2020, with all amounts reported in 2020 constant U.S. dollars.

Figure 1 shows that the proxy deportation budget rose very slowly from 1970 to 1985. Then after the passage of IRCA in 1986 it suddenly jumped from \$1 billion to \$1.6 billion in 1987 before returning to the prior trend through 1994, when Operation Gatekeeper was launched to boost annual funding. The proxy deportation budget continued to rise rapidly with the passage of additional anti-immigrant legislation in 1996 (the Illegal Immigration Reform and Immigrant Responsibility Act [IIRIRA] and the Antiterrorism and Effective Death Penalty Act [AEDPA]), reaching a value of \$4.8 billion in 2000. When we pick up the trend again in 2004, the ICE budget stood at \$5 billion, rising to \$7.2 in 2009 during the first year of the Obama Presidency. Then, after a pause from 2009 through 2016 as Obama scaled back deportations, we see a final surge to a record \$9.3 billion in 2020 under President Trump.

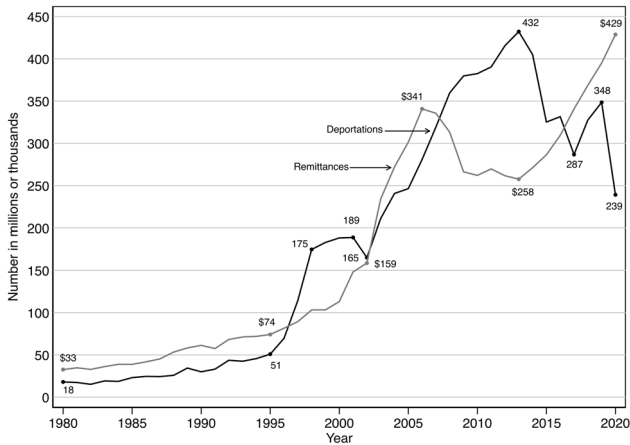


Fig. 2 Remittances to Mexico (millions of 2020 U.S. dollars) and total deportations from the United States (thousands) 1980–2020, obtained from the Mexican Migration Project (MMP) and the World Bank (2022)

As Fig. 2 shows, the annual number of Mexican deportations is closely linked to increases in the deportation budget. From 1980 to 1995 the number of deportations increased slowly, going from 18,000 to 51,000, and then rose rapidly to plateau between 175,000 and 189,000 during 1998–2001. After a brief dip down to 165,000 in 2002 the number shot upward to peak at 432,000 in 2013 before dropping back to 287,000 in 2017. The number rose again to reach 348,000 in 2019 before dropping with the onset of the COVID pandemic in 2020. Increases in the deportation budget and the number of deportations have been more salient for undocumented migrants, as they are directly at risk of deportation. Figure 2 also plots total remittances estimated by the World Bank (2022) to show the close correspondence between Mexican remittances and deportations. The correlation between the two series is 0.88, providing *prima facie* evidence for a close connection between deportations and remittance decisions.

In recent years, private profits have increasingly come to incentivize the arrest and detention of migrants as immigrant detentions became the fastest growing segment of the U.S. prison industrial complex (Díaz, 2012). Nearly two thirds of all spaces in the migrant detention system are now owned and managed by corporations such as the Geo Group and CoreCivic (Luan, 2018), which in 2009 successfully lobbied Congress for a quota of 34,000 detention beds required to be filled each day (Gilman & Romero, 2018). Over time, the average daily number of migrants housed within the immigrant detention system has grown substantially, rising from 9000 in 1996 to 47,000 in 2019 (Reyes, 2022).

States and localities have also increasingly passed their own anti-immigrant statutes (Reich, 2017). According to the National Council of State Legislatures (2022), a total of 4,003 state-level immigration-related bills were enacted between 2008 and 2020, though not all were hostile to immigrants. At the same time, federal initiatives have drawn state, county, and municipal police forces into the active enforcement of

federal immigration laws. For instance, 287(g) agreements authorized by IIRIRA have been implemented in different U.S. states and counties since 2005. This program allows state and local officials to check employees' migration status and to hold undocumented migrants for transfer to ICE. According to data from ICE (2022), detentions under 287(g) agreements totaled 122,233 in 2020.

Beginning in October 2008, the Secure Communities Program was rolled out on a county-by-county basis and was completely activated nationwide by 2013. The program created a screening process wherein every person arrested by local law enforcement officials in the United States would automatically be cross-referenced with federal authorities for immigration status and deportation eligibility (Ciancio & García-Jimeno, 2019). By automating the process, Secure Communities increased the likelihood of apprehension and marked the largest expansion of interior immigration enforcement in the United States to date.

How Deportations Affect Remittance and Savings Behavior

Transnational ties entail connections maintained between migrants and contacts in the home country (Glick Schiller et al., 1995; Levitt & Jaworsky, 2007). They include an array of economic, social, cultural, and political activities, which tend to be interlinked (Guarnizo, 2003). For instance, migrants often bring presents and tell their family and friends about ideas and practices they encountered at the destination (i.e., bring political and social remittances) when returning to visit the home country (Guarnizo et al., 2003; Levitt, 2001). Common forms of economic transnational ties are remittances and savings, when migrants send or carry foreign earnings back to the home country, a distinction that is the focus of this study.

Migrant remittances and savings comprise a significant portion of foreign exchange within migrant-sending countries and foreign earnings play a central role in helping families overcome budget constraints. They are also important indicators of migrants' degree of integration and investment in the destination. An extensive literature on remittances and savings brought back to the home country has accumulated in three broad analytical categories. One strand investigates transnationalism from the migrant's perspective, focusing on the decision to remit or save (Basu & Bang, 2013; Carling, 2014; Hagen-Zanker & Siegel, 2007; Rapoport & Docquier, 2005). Another strand examines the transmission channels through which migrants send or bring money to the home country (Alarcón et al., 1998; Orozco, 2004; Suro et al., 2002). The third category analyzes the receiver's perspective, or the role that remittances play in improving wellbeing and productivity at both the local and national levels in migrants' home countries (de la Garza & Lowell, 2002; Taylor & Castelhana, 2016; Yang, 2011).

This paper contributes to the first strand of research by studying how transnational economic ties created by remittances and savings are impacted by changing circumstances in the destination country—specifically by the rise in deportations. Beyond self-interest, prior work has identified four potential motivations for migrants to send or bring foreign earnings to places of origin: *altruism*, where migrants beneficently provide money to family or friends to improve their material wellbeing; *exchange*,

where migrants make money available to others in expectation of receiving assets or services in return; *repayment*, where migrants use foreign earnings to pay down debts; and *insurance*, where migrants diversify income streams or build savings to manage risks of various sorts (Garip, 2012).

In studying insurance motives, prior work has generally assumed that migrants seek to self-insure against economic shocks in the home country (Yang, 2011). For example, migrants can insure their households against potential loss of income using foreign employment to diversify their labor portfolios and hedge income sources. Studies show that income shocks due to changes in local rainfall in the Philippines and Bangladesh increase migrant remittance flows (Giannelli & Canessa, 2022; Yang & Choi, 2007).

Previous research shows that other kinds of shocks in the home country can likewise affect transnational ties. De et al. (2016) find that the 2009 Pacific Ocean tsunami was linked to higher remittances sent back home by Samoan households living in New Zealand. Similarly, remittances covered about 25 percent of damages from Hurricane Gilbert in Jamaica in 1992 (Beuermann et al., 2014; Clarke & Wallenstein, 2004). Lindley (2009) further finds that refugee migrants from Somalia remitted to family members who had stayed in the home country and were negatively impacted by warfare. These studies highlight that both economic and non-economic shocks are related to migrant remittances and savings, and that remittances are not necessarily planned but may be a post hoc coping strategy.

Here, we consider the additional risk undocumented migrants face when exposed to a rising probability of detention and removal from the destination country. Sudden and unexpected deportation is outside migrants' control and puts their livelihoods in danger. This risk can induce changes in transnational ties reflecting the fear of suddenly being forced to return in the case of deportation. Studies have noted that migrants at risk of deportation often invest less in a longer-term future in the United States. Instead of spending their earnings on products in the host country, they send the money back home to avoid losing it if they are deported (Hagan et al., 2010, p. 1816). This pattern suggests that migrants increasingly transfer their earnings back home as a way of self-insuring against the risk of deportation. In case they are deported, they will have some money in the home country to get them through the post-deportation adjustment period.

Remittances are transferred directly via money order or wire service, whereas savings brought back to Mexico are accumulated abroad before being carried across the border. In other words, both remittances and savings entail the transfer of foreign earnings to the home country, but represent alternative ways of accomplishing this goal (Durand, 1988). Since remittances and savings provide migrants with alternative means of repatriating foreign earnings, we argue that they are likely influenced differently by rising deportations. Specifically, we maintain that increasing deportations lead undocumented migrants to become more likely to remit (Amuedo-Dorantes & Puttitanun, 2014; Vaira-Lucero et al., 2012), as money that is remitted facilitates a return (Constant & Massey, 2003). In contrast, the likelihood of saving decreases, given that savings kept in the United States are difficult to access if migrants are deported (Amuedo-Dorantes & Bansak, 2006). Of course, migrants may also simultaneously remit and save, or decide neither to remit nor save. While

undocumented migrants may become less prone to simultaneously remit and save due to the uncertainty associated with keeping savings in the United States, the overall likelihood of engaging in transnational economic activities may increase due to the perceived need to self-insure.

An important factor in determining how risky it is to save money when faced with rising deportations is whether migrants are banked or not. Migrants who are banked can access their money even after deportation. However, those who are not banked cannot easily bring their savings with them as they are being deported. According to a survey conducted by the Pew Research Center and the Kaiser Family Foundation, 43 percent of Latino remittance senders do not have bank accounts and 55 percent do not have credit cards (Suro et al., 2002). In contrast, among non-Hispanic Black and non-Hispanic White people generally, only 32 percent and seven percent do not have bank accounts, respectively (Orozco, 2004).

Lack of proper identity documents was an important factor in whether migrants were banked before the *matricula consular* became widely accepted by banks in 2002. The *matricula consular* is a card issued by the Mexican government that documents the individual's place of birth and current U.S. residence. Today, many banks in the United States allow individuals with a *matricula consular* or an individual taxpayer identification number (ITIN) to open a bank account (Suro et al., 2002). Studying the impact of the *matricula consular* on Mexican migrants' remittance and saving behavior, Amuedo-Dorantes and Bansak (2006) found that having a U.S. bank account did not significantly raise monthly remittance flows. However, it did boost the amounts that undocumented and documented migrants brought back as savings.

Based on our review of the literature, therefore, we hypothesize that an increased risk of deportation will not only lead to a higher likelihood of remitting by undocumented migrants, but also to a lower likelihood of bringing savings back to the home country. The likelihood of engaging in both remitting and saving is similarly expected to decrease, as savings kept in the United States become riskier for undocumented migrants. At the same time, however, the overall likelihood of engaging in transnational economic activities may increase as undocumented migrants are exposed to a rising probability of detention and removal, meaning that they become less likely to neither remit nor save. Since documented migrants are not directly at risk of deportation, we expect to observe smaller changes in the remitting and saving behaviors of documented migrants.

Data and Methods

Our data come from the MMP, which includes 27,706 households randomly selected from 174 communities in 24 Mexican states, as well as 1075 households of settled out-migrants in the United States. The data comprise information from randomly sampled households in communities located throughout Mexico. Households are interviewed each year during the winter months, when seasonal migrants tend to return to Mexico. Data on settled out-migrants in the United States come from respondent-driven samples of migrants who no longer return regularly to Mexico. We ran analyses both including and excluding the U.S. sample, considering that

the decision to bring savings back to Mexico is closely related to return migration. (Migrants can only bring money back to Mexico if they make a return trip across the border.) However, considering that the results were very similar, we present results including the U.S. respondents to increase the sample size.

The interviews gather detailed social, demographic, and economic information on the household and its members. They further collect basic migration information on each person's first and last trip to the United States. Household heads and spouses are administered a year-by-year labor history and those heads who have migrated are asked detailed questions about their last trip to the United States, focusing on employment, earnings, and the use of U.S. social services. In this way, considerable retrospective life history data are compiled.

Communities in Mexico are chosen to provide a range of different sizes, regions, ethnic compositions, and economic bases. The sample includes isolated rural towns, large farming communities, small cities, and metropolitan areas. The methodology of the MMP yields results with a high degree of representativeness at the community level, and in some of the smaller pueblos and ranchos investigators have been able to survey every household in the community. Given that sampling is not targeted to migrants per se, but the entire community, the MMP collects a fairly large sample to generate a significant number of both migrants and non-migrants. Traditional methods of cluster sampling generally survey small numbers of respondents across a large number of areas, but this approach tends to yield small numbers of migrants and does not allow for generalizations at the community level. Comparisons between the MMP and nationally representative data on the Mexican population with U.S. migration experience, such as Mexico's 1992 and 1997 National Survey of Population Dynamics, indicate that the MMP data provide a remarkably accurate profile of the U.S. migrant population (Massey & Capoferro, 2004; Massey & Zenteno, 1999; Munshi, 2003). Detailed information about the MMP is available online (<https://mmp.opr.princeton.edu>).

In this study, we examine the behavior of household heads on their last trip to the United States, restricting the sample to trips that occurred in 1970 or later. The median number of years elapsed between the survey and the end of the most recent trip is three years. We also restrict the sample to persons 15 years of age or above at the time of the last trip (losing 72 individuals) and exclude legal temporary migrants given that the terms of their employment are determined by agreements between employers and the U.S. government rather than by markets (757 individuals). We further exclude 22 individuals who have missing information on their documentation status. This leaves us with a sample of 5,334 trips in undocumented status and 1,453 trips in documented status (for a total of 6,787 trip-years of observations). Considering that we focus on migrants' most recent trip, this is equivalent to 6,787 individuals.

Variables

Data on remittances and savings come from two questions addressed to migrant household heads about their last trip to the United States: (1) how much per month

did you send to your family in Mexico, and (2) how much money did you save and bring back to Mexico? Positive amounts reported for the first question indicate that the migrant remitted on their last trip to the United States, while positive amounts reported for the second question indicate that the migrant brought savings back to Mexico. Based on this information, we define a dependent variable containing four categories: whether migrants sent remittances to Mexico and brought back savings; whether migrants only remitted; whether migrants only brought back savings; and whether migrants neither remitted nor saved, which serves as the reference category.

Our leading independent variable measures the number of deportations nationwide, expressed in hundreds of thousands. We use lagged deportations by measuring deportations one year before the U.S. trip. Seeing that it takes some time for information about deportations to spread and to impact migrants' strategies, it is likely that migrants respond with some delay. We therefore expect that decisions about whether to remit and/or save are most strongly influenced by lagged deportations. However, we also estimated models measuring deportations in the year of the last trip, yielding very similar results.

Information on documentation status allows us to distinguish between documented and undocumented migrants. Multivariate models further control for variables that have been shown to be determinants of remitting and saving behavior in the literature (Marcelli & Lowell, 2005). With respect to demographic characteristics, we include age, gender, marital status, number of minor children, and education. We capture migrants' connections to the United States using dummy variables to indicate whether the spouse and children were in the United States during the last trip. Previous studies find that migrants who have closer connections and more financial obligations in the United States display a lower likelihood to remit or save (Jones, 2009; Massey & Basem, 1992).

We measure migrants' economic status in the United States to assess the remitting capacity of migrants. We thus control for the type of job, differentiating between white collar, blue collar, and agricultural jobs and disposable income on the latest U.S. trip (monthly earnings minus the costs of food and lodging).¹ To capture how risky it is to keep savings in the United States, we control for whether migrants are banked or have a credit card. We also include a dummy variable to control for whether individuals are interviewed in the United States and likewise control for the duration of migrants' last trip to the United States. All of the independent variables are time varying, except for education and gender which are fixed.²

¹ The MMP data set lists about 110 occupations, which are further classified into broader categories. Among white collar workers, the most common occupational category is manufacturing/repair skilled workers. Among blue collar workers, the most common categories are personal services workers in establishments and sales workers. Agricultural workers also include a small number of husbandry and forestry/fisheries workers.

² Three measures, specifically occupation, spouse in the United States and children in the United States, are available both longitudinally and as fixed indicators about the last U.S. trip. When we correlate measures from the year of the last trip and one year after arrival in the United States, if the trip lasted longer than a year, we find that r is 0.89 and above. Measuring control variables in the year of the most recent U.S. trip, thus, provides a good proxy of the measures impacting migrants' remittance and saving decisions.

We control for the lagged U.S. unemployment rate in deciles as a rough proxy for the business cycle. Other period effects are potentially also important for the remitting and savings behavior of migrants. However, considering that the variation we analyze comes from annual deportations, controlling for year of observation is not a feasible option. The correlation between the two data series is 0.91, so trying to disentangle the effects of period versus deportations is infeasible owing to the high degree of multicollinearity.

Methods

Our analysis of the effect of deportations on remitting and saving behavior of migrants begins in Eq. 1 with a simple multinomial logistic regression model that we estimate separately for documented and undocumented migrants:

$$P(Y_{it} = k) = \Lambda(\alpha_k + \beta_{1k} \text{deportations}_{t-1}) \quad (1)$$

where $Y_{it}=k$ refers to one of the alternatives of the trichotomous outcome that migrant i during year t both remitted and saved, remitted only, or saved only, compared to neither remitting nor saving. Since the outcome variable is categorical, we use a multinomial logistic link function as indicated by Λ . The term $\text{deportations}_{t-1}$ stands for lagged deportations. β_{1k} is the alternative-specific impact of lagged deportations and α_k is the alternative-specific constant intercept. Robust standard errors are reported.

To estimate and formally test differences between documented and undocumented migrants, the main analysis then combines documented and undocumented migrants into a single equation and assesses their differential response to rising deportations by interacting deportations with legal status while controlling for the background variables listed below the top two panels of Table 1. This specification is captured by Eq. 2, which predicts the likelihood of remitting and saving, remitting only, or saving only when compared to the likelihood of neither remitting nor saving:

$$P(Y_{it} = k) = \Lambda(\alpha_k + \beta_{1k} \text{undocumented}_{it} + \beta_{2k} \text{deportations}_{t-1} + \beta_{3k} \text{undocumented}_{it} \times \text{deportations}_{t-1} + \gamma_k X_i + \beta_{4k} \text{unemployment rate}_{t-1}) \quad (2)$$

where $Y_{it}=k$ and α_k are defined as before. The term undocumented_{it} is a dummy variable that equals one if in year t migrant i is undocumented and zero otherwise. X_i is a vector of controls for migrant background characteristics. The model also includes a set of dummy variables that control for the lagged U.S. unemployment rate in deciles. The term of greatest interest is β_{3k} , which provides an alternative-specific estimate of the additional change in remittance and saving behavior by undocumented migrants associated with rising deportations, compared to the change in remittance and saving behavior by documented migrants. As noted above, robust standard errors are reported.

Table 1 Mean values of variables used in the analysis of how deportations affect the remitting and saving behavior of Mexican migrants between the years 1970–2019

Variables	Undocumented migrants	Documented migrants		Total
Outcomes				
Likelihood of remitting and saving	0.37	0.34	*	0.37
Average monthly remittances and savings	\$333.32	\$380.88	*	\$343.50
Likelihood of remitting (only)	0.31	0.28	*	0.30
Average monthly remittances	\$193.65	\$158.55	**	\$186.14
Likelihood of saving (only)	0.08	0.10		0.09
Average monthly savings	\$39.24	\$52.36		\$42.05
Likelihood of neither remitting nor saving	0.23	0.28	***	0.24
Enforcement indicator				
Lagged deportations/100,000	0.53	0.40	***	0.51
Demographic background				
Age	31.42	38.24	***	32.88
Female	0.04	0.03	*	0.04
Married	0.66	0.81	***	0.69
Number of minor children	2.16	2.23		2.17
Years of education	5.69	5.73		5.70
Connections to U.S.				
Spouse in U.S.	0.07	0.16	***	0.09
Children in U.S.	0.05	0.13	***	0.07
Economic status in U.S.				
Not working	0.04	0.05		0.04
Agricultural job	0.24	0.33	***	0.26
Blue collar job	0.47	0.44		0.46
White collar job	0.25	0.19	***	0.24
Disposable monthly income/1,000	1.29	1.58	**	1.35
Banked	0.10	0.35	***	0.15
Credit card	0.04	0.11	***	0.05
U.S. experience				
Interviewed in U.S.	0.10	0.28	***	0.14
Years spent in U.S. on the last trip				
Less than 1 year	0.35	0.46	***	0.37
1–3 years	0.33	0.20	***	0.30
3+ years	0.32	0.34		0.32
Lagged U.S. unemployment rate				
Decile 1 (lowest unemployment rate)	0.10	0.07	***	0.10
Decile 2	0.11	0.07	***	0.10
Decile 3	0.06	0.10	***	0.07
Decile 4	0.19	0.28	***	0.21
Decile 5	0.06	0.02	***	0.05
Decile 6	0.12	0.13		0.12
Decile 7	0.15	0.17		0.16
Decile 8	0.09	0.08		0.09
Decile 9	0.06	0.05	**	0.06
Decile 10 (highest unemployment rate)	0.06	0.04	**	0.06
Number of cases	5,334	1,453		6,787

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Results

Descriptive Statistics

Table 1 presents descriptive statistics separately by legal status, with our dependent variables shown in the top panel. As can be seen, the likelihood of remitting and saving is higher for undocumented (0.37) than documented migrants (0.34). However, undocumented migrants send and bring lower amounts back home than the documented (\$333 versus \$381). The likelihood of remitting only is also higher for undocumented (0.31) than documented migrants (0.28), as is the amount remitted (\$194 among undocumented, and \$159 among documented migrants). The likelihood of saving only (0.09) and the amount saved (\$42) are similar for documented and undocumented migrants, while the likelihood of neither remitting nor saving is lower among undocumented (0.23) than documented migrants (0.28). These descriptive results show that one in three migrants sends remittances and brings savings back to Mexico. Migrants who remit and save also transfer the highest amounts back to Mexico. In contrast, a relatively small group only brings savings back to the home-country.

Our leading independent variable is the number of deportations of Mexicans nationwide, expressed in hundreds of thousands. One year before the average trip experienced by undocumented migrants U.S. authorities deported 53,000 Mexicans, versus 40,000 deportations in the year prior to the average trip year experienced by documented migrants. However, as shown in Fig. 2, this number varied considerably over time.

The remaining panels in Table 1 show mean values for the other independent variables. With respect to demographic characteristics, we see that irrespective of documentation status very few migrants were women (just three to four percent) and on average they had completed about six years of education at the time of the most recent trip. Those lacking documents were about seven years younger than those who were documented (31 years versus 38 years). As one might expect, documented migrants enjoyed greater access to migration-specific social capital than undocumented migrants. Whereas 16 percent of documented migrants had a spouse in the United States and 13 percent had a child in the United States, the respective figures were only seven and five percent among those without documents.

Irrespective of legal status, most migrants worked in blue collar jobs (46 percent). However, documented migrants more often worked in agriculture than undocumented migrants (33 percent versus 24 percent), and undocumented migrants more often held white collar jobs (25 percent versus 19 percent). Documented and undocumented migrants' disposable income also differed. Documented migrants reported an income of \$1,580 per month compared to only \$1,290 for the undocumented.

Differences in access to the banking system and holding a credit card were large. Whereas about 35 percent of documented migrants were banked, only 10 percent of undocumented migrants were so. Similarly, 11 percent of documented had a credit card compared to four percent among undocumented migrants. Documented migrants were more likely to be interviewed in the United States than the

Table 2 Coefficients from multinomial logistic models predicting the remitting and saving behavior of Mexican migrants to the United States compared to neither remitting nor saving from deportations between the years 1970–2019

	Likelihood of remitting and saving	Likelihood of remitting only	Likelihood of saving only
Undocumented migrants			
Lagged deportations /100,000	– 0.015 (0.063)	0.540*** (0.061)	– 0.679** (0.132)
McFadden's Adj. R ²		0.017	
N		5,334	
Documented migrants			
Lagged deportations /100,000	0.066 (0.119)	0.212 (0.127)	– 0.281 (0.227)
McFadden's Adj. R ²		0.002	
N		1,453	

Estimates are based on Eq. 1. Robust standard errors are in parentheses. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

undocumented (28 percent versus 10 percent). The duration of stay in the United States on the most recent trip also differed considerably between documented and undocumented migrants. Among documented migrants, 46 percent spent less than a year in the United States as compared to 35 percent among undocumented migrants.

Baseline Analysis

We begin by assessing whether an increased risk of deportation leads to a shift from savings brought back to Mexico to remittances among migrants who are undocumented. Table 2 shows results from multinomial logistic regressions estimated to predict the likelihood of both remitting and saving, the likelihood of remitting only, and the likelihood of saving only, from lagged deportations. All three outcomes are compared to the likelihood of neither remitting nor saving. Coefficients are estimated from Eq. 1 for documented and undocumented migrants separately. The top panel presents coefficients for undocumented migrants and the bottom panel shows results for documented migrants.

The estimates presented in the top panel of Table 2 reveal that, among undocumented migrants, the association between deportations and the likelihood of remitting and saving is similar to that of deportations and the likelihood of neither remitting nor saving. In contrast, the log odds of simply remitting increases by 0.540 as deportations increase. This yields an odds ratio of 1.716 ($\exp^{0.540}$), indicating a 72 percent increase in the odds of remitting for each additional 100,000 deportations.

Increasing deportations are also related to a lower likelihood of saving among undocumented migrants. An increase in 100,000 deportations is related to a decrease of 0.679 in the logs odds of returning to Mexico with savings, yielding about a 50

percent drop in the odds of saving per 100,000 deportations. Among documented migrants, in contrast, rising deportations are not significantly related to the likelihood of remitting and/or saving as shown in the lower panel.

Figure 3 presents unadjusted predicted probabilities of remitting and saving, of remitting only, of saving only, and of neither remitting nor saving for documented and undocumented migrants. The probabilities were generated by separately inserting observed deportations for each year into Eq. 1 for each legal status group with no additional covariates. The resulting trend lines indicate when the groups start to diverge in their saving and remitting behaviors. We find that undocumented migrants respond more strongly to deportations than documented migrants, a response differential that becomes especially clear when deportations skyrocketed following the 1996 passage of the AEDPA and IIRIRA legislation.

The top panel on the left side shows that the predicted probability of remitting and saving was higher among undocumented migrants than documented migrants between 1970 and 1990. Thereafter, remittances and savings dropped among undocumented migrants. Among documented migrants, remittances and savings do not appear to change during the observation period. The predicted probability of remitting only was initially similar among documented and undocumented migrants. In the 2000s, it doubled among undocumented migrants, while increasing only moderately among documented migrants.

The bottom panel on the left side shows that the predicted probability of saving only was relatively low among both groups throughout the observation period. Between 1970 and 1990, the predicted probability of saving was similar among documented and undocumented migrants. Subsequently, savings brought back to Mexico decreased especially among undocumented migrants. Finally, the predicted probability of neither remitting nor saving was initially lower among undocumented than documented migrants and dropped additionally in the 2000s. In contrast, among documented migrants the predicted probability of neither remitting nor saving did not decrease to the same extent.

These results indicate that the transnational economic engagement of undocumented migrants increases in response to rising deportations. This outcome is largely due to an increase in remittances, as the observed increase in remittances is counterbalanced by a decrease in remittances and savings transferred home as well as savings brought back. Among documented migrants, the likelihood of remitting and/or saving does not appear to change significantly as deportations rise.

Multivariate Analysis

Table 3 shows the estimates from multinomial logistic regressions that result when undocumented and documented migrants are pooled together to predict remitting and saving behaviors from lagged deportations controlling for legal status and other background characteristics with an interaction term included for undocumented status and deportations. The estimated model is based on Eq. 2, in which neither remitting nor saving serves as the reference category. Deportations and undocumented status have no significant main effects, suggesting that other things equal

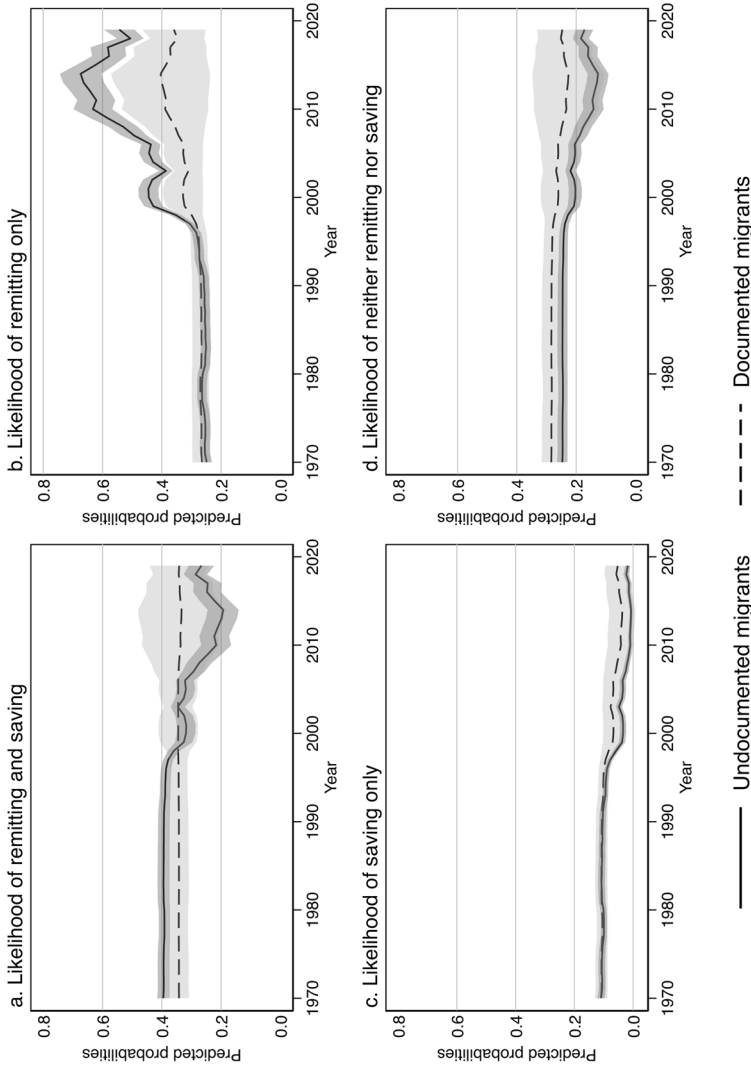


Fig. 3 Unadjusted predicted probabilities from multinomial logistic regressions estimating the likelihood of Mexican migrants to remit and save from deportations between the years 1970–2019. Predicted probabilities are estimated from Eq. 1 for documented and undocumented migrants separately. Predicted probabilities are shown by the annual number of deportations in the United States. The shaded areas indicate 95 percent confidence intervals. In order to obtain the confidence interval for the lower right panel, the reference category was changed to remitting only. Changing the reference category does not impact the predicted values but may slightly alter the estimated confidence intervals. Data from the Mexican Migration Project (MMP)

documented and undocumented migrants behave similarly with respect to the likelihood of remitting and saving, remitting only, and saving only, when compared to neither remitting nor saving. However, as deportations rise undocumented migrants grow increasingly likely to remit whereas documented migrants do not, since under most circumstances they are not directly affected by a rising risk of detention and removal. According to the equations, the log odds of remitting grows by five points with every 100,000 deportations ($0.112 + 0.417 = 0.529$, $p < 0.001$ based on the `lincom` post-estimation command in Stata), yielding an odds ratio of 1.70. This indicates a 70 percent increase in the odds of remitting per 100,000 deportations. In the savings equations, however, we observe that with each increase of 100,000 deportations the log odds of saving falls by about seven points (-0.684 , $p < 0.001$ based on the `lincom` post-estimation command in Stata), for an odds ratio of 0.50. This indicates a 50 percent drop in the odds of saving per 100,000 deportations.

With respect to demographic characteristics, females are significantly less likely to remit and save and to remit only compared to male migrants. The effect of age on remitting and saving is curvilinear, with the likelihood of remitting and saving rising across younger ages and declining at older ages. Married migrants are more likely to remit and save and to remit only than unmarried migrants, although they are less likely to do so when the spouse is in the United States. In contrast, the likelihood of bringing savings back home is positively related to having a spouse in the United States. As the number of minor children in the household rises, the likelihood of remitting increases, but the likelihood of bringing savings back to Mexico decreases.

Compared to non-working migrants, those who hold jobs unsurprisingly are more likely to remit and save, but the kind of job does not seem to affect the likelihoods very much. Increases in disposable income tend to increase the likelihood of remitting and saving. Those migrants who report being banked are more likely to bring savings back to Mexico than those who are not. Migrants who report having a credit card are more likely to remit only.

U.S. experience is differently related to the likelihood of remitting only when compared to the likelihood of remitting and saving and of saving only. Migrants who are interviewed in the United States are less likely to remit and save and to save only. Likewise, those who have spent shorter durations in the United States are more likely to remit and save and to save only. In contrast, duration of stay has no impact on remittances and being interviewed in the United States is positively related to the likelihood of remitting.

To get an understanding of patterns not only in relation to neither remitting nor saving, we also present predicted probabilities for each of the four outcomes in Fig. 4. Specifically, we plot adjusted predicted probabilities of the interaction between legal status and lagged deportations from the pooled regression models presented in Table 3, with the shaded areas indicating the 95 percent confidence intervals. Control variables are held constant at their mean values. The top panel on the left side shows that the predicted probability of remitting and saving decreases from about 0.40 to 0.10 among undocumented migrants as deportations rise from zero to 400,000. Similarly, among documented migrants the predicted probability of remitting and saving decreases as deportations rise.

Table 3 Coefficients from multinomial logistic regressions predicting the likelihood of Mexican migrants to remit and save compared to neither remitting nor saving from legal status, deportations, and selected control variables between the years 1970–2019

Independent variables	Likelihood of remitting and saving	Likelihood of remitting only	Likelihood of saving only
Legal status			
Undocumented	0.056 (0.112)	0.146 (0.115)	0.143 (0.162)
Deportation indicator			
Lagged deportations/100,000	- 0.245 (0.130)	0.112 (0.130)	- 0.502 (0.259)
Interaction			
Undocumented × Lagged deportations/100,000	0.213 (0.142)	0.417** (0.140)	- 0.182 (0.275)
Demographic background			
Age	0.086*** (0.019)	0.036 (0.019)	0.016 (0.026)
Age squared	- 0.001*** (0.001)	- 0.001 (0.001)	- 0.001 (0.001)
Female	- 0.706*** (0.184)	- 0.563*** (0.164)	0.009 (0.236)
Married	0.299*** (0.090)	0.436*** (0.089)	- 0.057 (0.130)
Number of minor children	0.022 (0.022)	0.064** (0.023)	- 0.076* (0.036)
Years of education	- 0.008 (0.011)	- 0.012 (0.011)	0.028 (0.016)
Connections to U.S.			
Spouse in U.S.	- 0.795*** (0.141)	- 1.250*** (0.135)	0.835*** (0.149)
Children in U.S.	- 0.214 (0.147)	- 0.094 (0.147)	0.240 (0.183)
Economic status in U.S. (ref. not working)			
Agricultural job	1.706*** (0.204)	1.332*** (0.189)	1.634*** (0.341)
Blue collar job	1.990*** (0.193)	1.434*** (0.180)	1.984*** (0.324)
White collar job	1.738*** (0.197)	1.358*** (0.185)	1.745*** (0.328)
Disposable monthly income/10,000	0.218*** (0.049)	0.085** (0.033)	0.206*** (0.047)
Banked	- 0.040 (0.132)	- 0.109 (0.119)	0.502** (0.166)

Table 3 (continued)

Independent variables	Likelihood of remitting and saving	Likelihood of remitting only	Likelihood of saving only
Credit card	0.163 (0.212)	0.447** (0.174)	- 0.490 (0.282)
U.S. experience			
Interviewed in U.S.	- 1.907*** (0.156)	0.322** (0.104)	- 2.521*** (0.242)
Years spent in U.S. on last trip (ref. 3+ years)			
Less than 1 year	0.900*** (0.097)	0.110 (0.098)	0.913*** (0.143)
1-3 years	0.514*** (0.092)	0.132 (0.088)	0.268 (0.139)
Lagged U.S. unemployment rate (deciles)	Yes	Yes	Yes
McFadden's Adj. R ²		0.113	
N		6,787	

Estimates are based on Eq. 2. Robust standard errors are in parentheses. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

The predicted probability of only remitting increases from about 0.25 to 0.80 among undocumented migrants, while it increases to a smaller extent among documented migrants. The predicted probability of only bringing savings back to Mexico is low at all levels of deportations. Yet, among undocumented migrants, the predicted probability of only saving decreases from 0.1 to 0.004 as deportations rise from zero to 400,000. Finally, the predicted probability of neither remitting nor saving decreases from about 0.20 to 0.10 among undocumented migrants, while it increases somewhat among documented migrants.

In sum, changes in the remitting and saving behavior are larger among undocumented migrants than among documented migrants. Undocumented migrants' likelihood of neither remitting nor saving decreases, while we only observe modest changes in the transnational behavior of documented migrants. We also find that undocumented migrants increase their transnational economic engagement by transferring more remittances back home, while the likelihood of remitting and saving as well as bringing savings back decreases.

Sensitivity Analysis

We run sensitivity analyses by exploiting information on the amount remitted and saved, in order to assess how the dollar amounts transferred back to Mexico change with immigration enforcement. Table S1 in the Supplement provides results from ordinary least squares on the log amount remitted and saved, remitted only, and saved only.

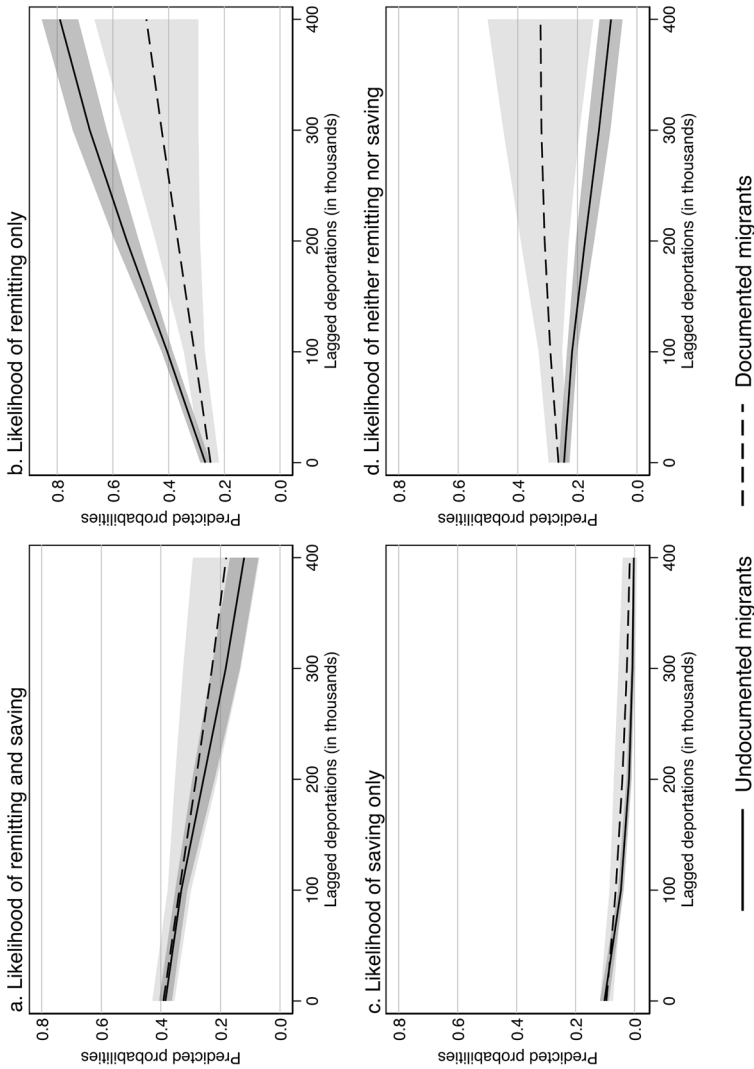


Fig. 4 Adjusted predicted probabilities from multinomial logistic regressions estimating the likelihood of Mexican migrants to remit and save from legal status, deportations, and selected control variables between the years 1970–2019. Predicted probabilities are estimated from Eq. 2 interacting documentation status and deportations. Predicted probabilities are shown by lagged deportations (in thousands). Control variables are held constant at their mean values. The shaded areas indicate 95 percent confidence intervals. Data from the Mexican Migration Project (MMP)

The amount remitted and saved as well as the amount saved is lower among undocumented than documented migrants. The amount remitted and saved also decreases as deportations rise, but the decrease is similar among documented and undocumented migrants. In contrast, the amount remitted is similar among undocumented and documented migrants and does not change as a result of rising deportations.

Together with the main results, these findings reveal that undocumented migrants become more prone to remit as deportations rise, but they remit similar amounts. The probabilities and amounts remitted and saved decrease among both groups. This indicates that the overall amount of money transferred and brought back to Mexico among documented migrants decreases. Among undocumented migrants, we do not find a commensurate decrease. Instead, the overall amounts transferred back increase, mainly due to observed increases in the likelihood to remit.

We also run sensitivity analyses excluding migrants who have any missing information on remittances or savings. In the main analysis, we code missing information on the amount remitted or saved as indicating that migrants did not remit or save. Arguably, a missing value may be commensurate to a zero value when it comes to the amount remitted and/or saved. Figure S1 in the Supplement provides similar patterns to those presented in the main analysis, showing that the likelihood of remitting increases among undocumented migrants as deportations rise. In contrast, increasing deportations are related to a reduced likelihood of remitting and saving, and only bringing savings back to Mexico. Likewise, the likelihood of neither remitting nor saving decreases among undocumented migrants while remaining stable among documented migrants. Corresponding estimates are provided in Table S2, but point estimates are difficult to compare to the main results due to compositional changes in the reference group of individuals who neither remit nor save and overall higher prevalences.

Furthermore, we use years elapsed between the return from the most recent trip and the survey. Given that the questions are retrospective, information may be imprecise due to recall error. Here, we analyze a reduced sample of migrants who returned less than ten years prior to the survey ($n=4,792$). Figure S2 in the Supplement shows that the likelihood of remitting increases among undocumented migrants as deportations rise (with corresponding estimates in Table S3). In contrast, increasing deportations are related to a reduced likelihood to remit and save and to bring savings back to Mexico by both undocumented and documented migrants. The likelihood of neither remitting nor saving increases among the documented, while we observe a slight decrease among the undocumented. These results are in line with our main findings and show that immigration enforcement is related to an increase in remittances, but a decrease in saving among undocumented migrants.

Conclusion

In this study, we analyze the effect of federal deportations on the remittance and saving behavior of Mexican migrants to the United States. Multinomial logistic regressions estimated using data from the MMP from 1970 to 2019 reveal that rising deportations lead to an increase in the transnational economic engagement

of undocumented migrants, which is increasingly channeled into remittances. In contrast, documented migrants are not significantly impacted by changes in deportations.

We also show that an increasing prevalence of deportation is related to changes in the way transnational economic ties are upheld by undocumented migrants. Results reveal that rising deportations relate not only to a stronger tendency to remit, as suggested by previous studies on immigration enforcement policies (Amuedo-Dorantes & Puttitanun, 2014; Vaira-Lucero et al., 2012), but also to a lower likelihood of bringing savings back to Mexico. This is in keeping with the view that it is risky to keep savings in the United States (Amuedo-Dorantes & Bansak, 2006). Given that most migrants are unbanked, especially the undocumented, the rising prevalence of deportation puts accumulated savings at considerable risk. This may prompt undocumented migrants to send their earnings back to Mexico directly in the form of remittances.

From a policy perspective, these results underline the importance of conceptualizing migrant decision-making as a choice between four options: saving only, remitting only, both remitting and saving, and neither remitting nor saving. This differentiation reveals that the overall likelihood to engage in transnational economic activities increases, although the likelihood of saving only as well as of both remitting and saving decreases. The observed increases in the transnational economic engagement of undocumented migrants may be induced by uncertainties motivating migrants to self-insure. This pattern suggests that undocumented migrants increasingly rely on remittances in an attempt to self-insure against the risk of deportation. Among documented migrants, the need to self-insure appears to be weaker and the likelihood to remit and/or save does not change significantly as deportations rise.

Fear of deportation and insecurity about a future in the United States may then limit migrants' contributions to destination communities and create barriers to integration. Depending on the motivation to remit, the remittance and savings behavior of migrants is distinctly related to integration (Carling, 2014; Roberts et al., 1999). These investments in the home country or the destination can have contradictory or mutually reinforcing impacts (Tsuda, 2012). In combination with prior findings, our results suggest that shocks in the destination country, such as the risk of apprehension and discrimination, compel migrants to heighten their transnational activities (Glick Schiller & Fournon, 1999; Stepick, 1998). The observed increase in the transnational economic engagement occurs despite earnings decreases and reduced homeownership among undocumented migrants experienced due to rising deportations (Rugh & Hall, 2016). These outcomes have important implications for the living conditions of undocumented migrants and their families in the United States. Considering that many children of undocumented migrants are U.S. citizens, this may additionally increase social disparities in the next generation of Americans (Bean et al., 2015; Yoshikawa, 2011).

Our finding that undocumented migrants' savings brought home decrease while their remittances increase may also carry implications for the re-integration of deported migrants in Mexico. A growing literature shows that deportation is linked to a high economic cost and that the re-integration of deported migrants can be a difficult process (Dominguez-Villegas & Bustamante, 2021; Hagan et al.,

2019; Silver et al., 2021; Wassink & Hagan, 2020). Bringing less savings back to Mexico may be associated with longer stays in the United States and a lower number of border crossings, due to the rising risk of apprehension at the border (Massey et al., 2015). Lower connectivity with the home country may lead to greater difficulties in re-integrating culturally and socially following a deportation. In contrast, increased remittances sent back by undocumented migrants can constitute an important economic resource for their re-integration in the home country.

Considering the increase in deportations in many European countries and Canada, our findings are important in other contexts as well (Anderson et al., 2011). While an increasing number of studies address the link between transnational economic ties and integration in Europe (Schunck, 2014; Van Meeteren, 2012; Wingens et al., 2011), less is known about the impact of policies on migrants' economic transnational ties. Thus, further research is needed to ascertain whether economic transnational ties are linked to deportations in a similar way in other contexts.

This study has a number of limitations. We necessarily focus on associations and cannot infer the causal effect of deportations on remittances and savings. Despite this limitation, we control for a large set of variables. We also use information on the U.S. unemployment rate as a rough proxy of the business cycle. Considering that we analyze lagged deportations, we are however unable to include controls for other period effects. Additionally, recall error is a concern in studies that analyze retrospective data. This paper uses information on years from the most recent trip until the survey to show that recall problems are not driving the results.

Notwithstanding these limitations, this study underscores the importance of investigating migrants' remittance and saving behavior together. Rising deportations appear to lead to an increase in the economic transnational engagement of undocumented migrants. This outcome is mainly due to an increase in remittances, as the likelihood to bring savings back to Mexico decreases among undocumented migrants. In future research, it will be important to study how economic disparities between documented and undocumented migrants change as undocumented migrants' remittances increase, as well as how these disparities impact their children's development.

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Data Availability The data that support the findings of this study are openly available in <https://mmp.opr.princeton.edu>.

Code availability The code can be made available upon request.

Declarations

Conflict of interest The authors report no competing interests to declare that are relevant to the content of

this article.

Ethics approval The survey data collected in the Mexican Migration Project were approved by the ethics committee.

Consent to participate Verbal informed consent was obtained prior to the interview.

Consent to publish Survey respondents consented to the collected information being published.

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