Reversed Migration Trends and Local Labor Markets *

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October 23, 2018

Abstract

We estimate the effects of the unprecedented decline in Mexican net migration from 2006 to 2012 on labor markets in Mexico. We use an instrumental variable strategy that isolates demand for Mexican labor in U.S. labor market and relies on historical migration patterns. We find that the decline in migration reduced employment for lower skilled men and increased wages for high skill men and women. We also find that among those employed, there is a decline in self-employment for men, while both men and women increasingly shift into salaried work, in line with a story in which reduced remittances leads remaining household members to seek higher paid work. Our findings imply that declines in migration can have an impact on labor markets in sending countries.

JEL Classification: J21, J16, J31, O15.

Keywords: Migration, Mexico, labor force participation, formality.

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1 Introduction

The majority of the literature on the labor market effects of migration focuses on periods of rising migration and on receiving countries. In this paper we do the opposite, examining a period of falling migration and its impacts on the sending country. We do this for Mexico, one of the largest migrant sending countries in the world which experienced a dramatic decline in out migration starting in the middle of the 2000s (see Figure 1).[1] Estimates from Mexican survey data indicates declines in flows of over one million individuals (ENADID 2009 and 2014), which means the potential labor supply shock in Mexico is large.[2] Ex-ante there is no reason to believe that the effects of this shock should be symmetric to those found either in receiving countries or sending countries in periods of high out migration. Understanding these differences, if they exist, is important given recent increases in restriction on migration in receiving countries.

There are several channels through which reverse migration trends may operate. First, there is the direct impact of people who would have migrated in earlier periods. Previous literature on out-migrants suggests these individuals are male, young, and drawn from the lower to middle portion of the education distribution (Chiquiar and Hanson 2005, Orrenius and Zavodny 2005, Fernández-Huertas Moraga 2011, Rendall and Parker 2014).[3] Thus

[1] According to the *Instituto de los Mexicanos en el Exterior* an estimated 12 million people, or 10% of the population, lived abroad in 2016.

[2] Using the Mexican surveys ENADID 2009 and ENADID 2014, we find that the five year migration rate fell by more than one million individuals, or more than 50%, from 2009 to 2014. Similarly in Figure 2 using data from the United States where approximately 90% of all Mexican migrants go (ENADID 2009), there is a leveling off of the Mexican born population in the U.S. around the year 2007. Passel and Cohn (2016), document that over the time span of 2007 to 2014 net migration rates fall below zero, with the number of new arrivals no longer outpacing the number of migrants who return home. Meanwhile Norlander and Sorensen (2016) find that growth in the *general* immigrant population declines sharply, and that this decline is the largest witnessed in over one hundred years.

[3] Several authors argue that the type of educational selection depends on other factors. For example, McKenzie and Rapoport (2010) find that the degree of educational selection depends on the size of the migration network, with stronger networks exhibiting more negative selection than weaker ones.

the stock of workers that likely has grown the most with the decline of out migration is young men with a primary or some secondary education. These increases also affect the relative scarcity or abundance of different types of workers, potentially leading to changes in wages. For example, Mishra (2007) finds that emigration increases wages overall in Mexico, but that the increases are larger for workers with high levels of education than low levels of education. She attributes this to higher *rates* of migration for more educated workers.[4]

Second, there is the indirect impact in the form of declining remittances, which may lead individuals, particularly women, to seek out or intensify their work.[5] For example, examining a period of rising migration, Amuedo-Dorantes and Pozo (2006) and Hanson (2007) find that women decrease their labor market activity when remittances increase. Amuedo-Dorantes and Pozo (2012) find that increasing volatility of remittances leads to increased employment among men and women, and an increase in the intensity of work for women. Amuedo-Dorantes and Pozo (2006) also find that remittances change the composition of work, with non-migrant men moving out of formal sector work and into informal sector work. This complements theoretical work by Shapiro and Mandelman (2016), who find that remittances not only affect whether or not individuals are employed, but also whether they are in salaried or self-employment.

Meanwhile, Villarreal (2016) argues that an education-occupation mismatch may drive migration, as he finds that international migrants in Mexico are more educated than their peers within an occupation.

[4]There also is the direct channel of return migrants, which, as we document below, is less salient in this case given that return migration rates do not change over the time period we examine. In general, return migrants may return to the home country with human capital and savings acquired abroad, and may be complements to, rather than substitutes for, non-migrant labor if they use the capital acquired abroad to start firms that hire non-migrants (Dustmann and Goerlach 2016, Reinhold and Thom 2012 Hausmann and Nedelkoska 2018).

[5]Data from the Central Bank of Mexico show a decline in nominal remittances of approximately 20% from December 2005 to December 2009. Source: `http://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?accion=consultarCuadro&idCuadro=CE81&locale=en`

In sum, the literature suggests that the direct and indirect effects of declining migration operate in opposite directions, as increased competition for jobs within Mexico may lower employment, while the decline in remittances may push remaining household members to work more. We estimate individual responses using repeated cross-section data of nationally representative surveys on employment and occupation in Mexico (the ENOE). This dataset is the only one from Mexico with detailed labor market information, information on out and return migration, wide geographic coverage (state level representation) and high frequency time variation (quarterly). This allows us to examine changes in net migration rates and labor market activity at the state level over time.

The challenge to identifying the effects on labor market outcomes stems from the possible endogeneity of migration rates. To address this concern we use a demand-pull instrument that relies on demand for Mexican born labor across different U.S. states and industries and historic migration patterns. The exogeneity of our instrument partially rests on the argument that due to the persistence of migration networks, weights from periods earlier than our sample predict migration from sending Mexican states but are uncorrelated with contemporaneous local shocks. We provide various tests of this assumption, showing that the relationship is robust to several measures of migration networks, different measures of demand for Mexican labor, the inclusion of numerous controls for local economic shocks, and endogeneity to labor market adjustments due to past migration shocks (Jaeger et al. 2018). We also find limited evidence of bias from internal migration or covariate shocks, as the correlation between industrial employment trends across sending Mexican and receiving U.S. states is quite low.

Overall we find that falling net migration leads to significant declines in employment

for men and that these declines are concentrated among individuals with less than a college education. Among this group we also see a substitution away from self-employment and into salaried employement. This is consistent with a story of increased competition for low to medium skill jobs. Among men with a high school degree we find some evidence that informal labor markets may be absorbing the increase in the supply of potential workers. Meanwhile, for women we find significant increases in labor force participation, employment and salaried work, and decreases in unpaid work. This aligns with a story in which declining remittances lead remaining household members, particularly women, to seek more stable and higher paid employment. Despite evidence that individuals shift into different types of jobs, we find no evidence that they intensify their work in the form of hours. We do, however, find a significant impact of net migration on real hourly wages among the higher educated workers. This is consistent with a model in which the relative scarcity of college educated workers increases, and as such we see higher wages for this group.

The rest of the paper is structured as follows: in section 2 we describe our main data source, the ENOE; in section 3 we discuss our instrumental variables (IV) strategy; in section 4 we present our first stage results followed by the second stage IV results in 5; in section 6 we check the robustness of our results to internal migration and covariate shocks. In section 5.1 we show outcomes by educational category. Section 7 concludes.

2 Data

The data on migration rates and labor force outcomes come from the Mexican National Survey of Occupation and Employment (the *Encuesta de Ocupación y Empleo*, or the ENOE), a rotating labor force survey conducted by the National Institute for Statistics and Geography (INEGI).[6] The ENOE began in the first quarter of 2005 and is designed to provide a representative picture of labor markets at the national and state level in any given quarter. In our analysis we start with the first quarter of 2006, in order to use four quarter migration rates, and end in the fourth quarter of 2012. This yields a sample of more than 5 million individuals. Given the lagged nature of our migration variable (detailed below), to avoid shrinking our sample size further , we do not exploit the panel nature of the ENOE, instead using a repeated cross-section.[7]

In Figure 1 we show out and return migrant flows at the national level using ENOE data. The flows are calculated by dividing total out or return migration by the non-migrant population. A vertical line is placed in the fourth quarter of 2007, the official start of the Great Recession in the U.S. The graph shows first, a steady and steep decline in net migration from the beginning of the series, in the first quarter of 2005, to the initiation of the Great Recession;[8] and second, the driver of this decline is out migration

[6]Data and documentation for the ENOE are on INEGI's website, `www.inegi.gob.mx`

[7]The ENOE measures migration rates on a quarterly basis. In the first survey round respondents are asked to list all household members and then repeat the list in each subsequent survey. Anyone listed as absent from the household after the first survey because they moved abroad is counted as an out-migrant. Anyone listed as an addition to the household because they returned from abroad is counted as a return migrant. These measures are short-term and only capture migration over the five quarter period in which a household appears in the sample. As such individuals who were return migrants before the survey are not coded as return migrants, while individuals who leave after the survey are not coded as out migrants. Nevertheless, these migration rates match those from other data sources. Rendall et al. (2011) find that the ENOE generates similar out and return migration rates as other Mexican datasets that document migration over longer time periods, such as the ENADID (the National Survey of Demographic Dynamics). They conclude that the ENOE is a valid data source on migration to and from the U.S.

[8]The net migration rate falls from 0.3% in the first quarter of 2005 to 0.005% in the first quarter of

from Mexico rather than increases in return migration to Mexico. These trends in both out and return migration are the same as those found by Rendall et al. (2011), Villarreal (2014), and Chort and de la Rupelle (2016). They highlight that the larger impact is through reduced out migration rather than through increased return migration.

We next turn to the labor market outcomes of working age adults, defined as those between the ages of 18 to 65.[9] Summary statistics are provided in Table 1. All values are population weighted, and we show results for the full sample as well as for men and women separately. The reasons for the separation emerge in the first row, which show large differences in employment rates. While 83% of men are employed in any given quarter, only 47% of women are.[10] We also see gender differences in hours worked and wages for those who are working. For employed men, the average number of hours worked is 45, while for employed women the average is 37. Meanwhile, average hourly wages, measured in Q12005 real pesos, are 18.97 pesos for men, but 17.92 for women.[11]

We also examine the composition of work, starting with formality. We use a common definition for formality in Mexico, defining a job as formal if the worker is registered with the Mexican Institute for Social Security (IMSS).[12] Along this dimension we find no differences across women and men. Approximately 38% of each is formally employed, a

2009– a 98% decline.

[9]We also consider a sample that excludes individuals who are recorded as out or return migrants during the survey period. However, the remaining sample does not fully capture the non-migrant population, as individuals who migrated abroad and returned in periods prior to the survey are not counted as migrants. There also is no data on remittances that would allow us to identify households with an out migrant from a earlier period. The results from this sample, however, are similar to those using the full one, and are available upon request.

[10]A person is defined as employed if they report working in any capacity outside of home production. Thus those with zero values are non-employed, and include unemployed individuals (in the labor force and looking for work) as well as those not in the labor force. We group the last two together given low rates of unemployment.

[11]We deflate all income values to Q12005, the first period in the ENOE, using CPI values from INEGI

[12]Mexican labor regulation requires employers to register workers with IMSS when they are hired (Levy 2008 and Cano-Urbina 2015)

low number which speaks to the high rate of informality in Mexico.

We see larger differences by gender when we look at job type, defined as salaried, self-employed or unpaid work. Salaried individuals are defined as those with a boss, and can include formal and informal employees. Self-employed individuals are defined as those without a boss, include firms with no employees or employees, and also can be formal or informal. Unpaid individuals largely work for family firms. There is a high degree of overlap between formality and job type, as 57% of salaried workers are formal, while less than 1% of self-employed and unpaid workers are. In terms of the composition of the labor force, 68% of workers are salaried, 27% are self-employed and only 5% are unpaid. Women have higher rates of unpaid work and lower rates of self-employment and salaried work than men. Finally, the distribution across education levels indicate that most people have primary education or less, while nearly 28% have beyond a high school degree.

3 Empirical Strategy

We use the ENOE data to estimate the coefficients in the following model:

$$Outcome_{isqy} = \beta_0 + \beta_1 \Big(\frac{NetMigration}{Population} \Big)_{sqy-4} + X'_{sy}\gamma + Z'_{iqy}\lambda + \delta_s + \delta_q + \delta_y + \epsilon_{isqy} \quad (1)$$

The dependent variable is the labor market outcome for individual i living in Mexican state s, quarter q and year y. This is modeled as a linear function of the net migration rate for the previous 4 quarters for a given state, year and quarter. It also is a function of quarter, year, and state fixed effects, and individual time varying controls (Z_{iqy}), including marital status and household size. We also include state time varying controls (X_{sy}) to capture local economic shocks in the sending locations. We use state-year real GDP per

capita and state-quarter measures of employment rates and an index of industrial activity from INEGI. We use population weights and cluster standard errors at the state-quarter-year level.

We instrument for the net migration rate given concerns that it is linked to push factors that simultaneously change the incentives for Mexican workers to leave Mexico or return home from abroad and labor market outcomes for those who remain. The instrument is based on a key pull factor, which is demand for Mexican labor in U.S. labor markets, the destination for approximately 90% of Mexican migrants (ENADID 2009 and 2014). Several papers document that U.S. pull factors are the strongest predictor of out-migration from Mexico. For example, Norlander and Sorensen (2016) estimate that more than 60% of the decline in migration is due to pull rather than push factors. Villarreal (2014) shows that out-migration closely tracks changes in Mexican-American employment in the U.S. and job gains in construction, which hires a large percentage of Mexican born labor. He also finds that the Mexican born employment rate in the U.S. and employment gains in the top 5, 3 and 1 sectors that employ Mexican born labor are significant predictors of migration.

3.1 Instrumental Variable Strategy

We create a measure of predicted migration following Card (2001).[13] Key to the feasibility of our demand measure is the fact that Mexican states have historically sent migrants to different locations in the U.S. and labor demand, in turn, varies across these locations.

[13]This also is similar to the instrument used by Theoharides 2014, Conover et al. 2017 and Amuedo-Dorantes and Pozo 2006.

The instrumental variable is defined as:

$$PredictedNetMigration_{sqy} = \frac{\sum_{g=1}^{51} M_{gqy}\lambda_{gs}}{N_{sqy}} \tag{2}$$

Where: M_{gqy} is a measure of demand for Mexican labor in U.S. state g as of a given quarter q and year y. The combination of sending Mexican state and U.S. receiving state is determined by λ_{gs}, or the fraction of Mexicans in U.S. state g that are from Mexican state s. To generate a migration rate we divide this total by N_{sqy}, the number of non-migrants in Mexican state s in a given quarter and year. We describe how M_{gqy} and λ_{gs} are calculated below.

3.2 Measure of U.S. Demand for Mexican Labor

To construct the measure of demand for Mexican labor in the U.S. (M_{gqy}) we use monthly data from the Current Population Survey (CPS), the U.S. labor survey, as accessed through IPUMS (Flood et al. 2017). Using three month averages we construct a measure called "potential jobs", which is the stock of employment in different U.S. states and industries weighted by Mexican born individuals' historic presence in each industry. Specifically, we calculate the number of all men and women age 18-65 in each U.S. state, quarter and year employed in each industry, defined by two digit code. Whether or not these jobs can be considered a *potential* job for Mexican born men or women, however, depends on their historic presence in those industries. For example, if Mexican born men historically worked in construction but not finance, then construction jobs would be considered as potential jobs while finance jobs would not. To determine this designation we calculate the importance of each industry as a source of employment historically for Mexican born workers. To ensure that our weights are not driven by contemporaneous

shocks in Mexico that drive workers into particular industries, we use data from the year 2000 Census, which pre-dates our sample. We then calculate the percentage of Mexican born individuals that work in different industries separately by gender, as the industries where Mexican born men and women work differ.

Formally, we define demand for Mexican labor as:

$$M_{gqy} = \sum_{i=1}^{I} w_{if} * J_{gift} + \sum_{i=1}^{I} w_{im} * J_{gimt} \tag{3}$$

Where w_{im} (or w_{if}) is the percentage of Mexican men (or women) age 18-65 in the U.S. that work in industry i, according to the year 2000 Census and J_{gimt} (or J_{gift}) are male (or female) workers in U.S. state g, industry i, and time period t. We re-emphasize that the weights are time invariant and do not vary across U.S. states, reducing concerns that they reflect supply shocks in Mexico that drive Mexican workers into specific industries in specific years.[14]

Given that individuals likely do not respond simultaneously to demand conditions, we take the average of a specific M_{gqy} over the previous 4 quarters. To ensure that contemporaneous migration rates do not affect the measure of demand (as the level of employment will be affected if individuals return to Mexico) we exclude the current quarter from the measure. For example, for the first quarter of 2006, potential jobs are measured as the average for Q42005, Q32005, Q22005 and Q12005.

[14]For example, let i=construction, g=California, d=men, and t=Q12005. Suppose there are 30,000 18-65 year old men working in construction in California in this period. Also suppose that 30% of 18-65 year old Mexican men in the U.S. work in construction in 2000. So for Mexican men there are 0.3*30,000=9,000 potential construction jobs in California in 1Q12005. These jobs are then summed across all industries for each state, quarter and year to create an aggregate measure of potential jobs for each state and time period.

3.3 Weighting Matrix Data Source

We allocate the demand for Mexican labor using a weighting system based on historic migration patterns for all Mexican states going to all receiving states in the U.S. To estimate the weights we use total migration flows from the EMIF Norte Survey (*Encuestas sobre Migración en las Fronteras Norte y Sur de México*, or Surveys on Migration to the Northern and Southern borders of Mexico) (EMIF). Using a probabilistic sampling methodology for mobile populations, this dataset collects information on migrants, 15 years old and older, in transit to the U.S. and who are coming from Mexico.[15] In the survey, migrants are asked the state where they were born, and the US state to which they plan to travel, and from this we calculate the percentage of Mexican migrants in each U.S. state that are from a given Mexican state. To abstract from the idiosyncrasies of any given year, we use an aggregate collected for all years prior to our outcome data (1995, 2001 and 2002). It is important that these percentages pre-date our outcome data, and should help generate an instrument that is not correlated with contemporaneous factors in Mexico that determine migration and labor market outcomes. We provide more tests of this assumption in section 6.[16]

[15]Migrants are interviewed in locations in the northern Mexican border and at airports during 12 months of the year.

[16]Given that we use both male and female migrants to construct the EMIF weights, one concern that arises is that the EMIF is more representative of male migration than female migration (Rendall et al. 2005).

4 First Stage

The first stage regression is:

$$\begin{aligned}\left(\frac{NetMigration}{Population}\right)_{sqy-4} &= \alpha_0 + \alpha_1 \frac{1}{4}\sum_{j=1}^{4} PredictedNetMigration_{sqy-j} \\ &+ X'_{sy}\gamma + Z'_{iqy}\lambda + \delta_q + \delta_y + \delta_s + u_{isqy}\end{aligned} \tag{4}$$

The first stage results are shown in Table 2. They show that our instrument is a significant predictor of net migration across states and time. The coefficient on the instrument of 0.028 suggests that a one standard deviation increase in predicted migration (0.32%) is associated with an increase in net migration of 0.9%, which is quite large relative to the mean of 0.3%. Furthermore the F statistic is high enough to reject the null that our instrument does not predict net migration rates.

The validity of our instrument rests on the argument that potential jobs capture time and state varying demand shocks in the U.S. To assess the strength of this claim we check the robustness of our instrument to alternative measures of demand for Mexican labor. We consider the following alternative measures from the CPS: (1) the total number of individuals employed in a given state, quarter and year; (2) and employment rates for all individuals in a given U.S. state, quarter and year. Unlike our original IV, these values are not weighted by the percentage of Mexican men (or women) age 18-65 in the U.S. that work in industry i (w_{im} or w_{if}). These results are presented in columns two and three of Table 2, and show that while these alternative demand measures are not as strong as the original one, they are significant predictors of net migration.

Meanwhile, the exogeneity of our instrument partially rests on the argument that due to the persistence of migration networks, weights from an earlier period predict migration

from sending Mexican states but are uncorrelated with contemporaneous local shocks. We assess the strength of this claim by looking at the persistence of migration networks across different data sources.[17] We consider two alternative sources for our weighting matrix between U.S. and Mexican states. The first is from a module on international migration included in the 2002 National Survey of Employment (ENE), conducted by INEGI. This survey captures migration flows over the five year period spanning 1997 to 2002. The second comes from information from the *Instituto de los Mexicanos en el Exterior* on the issuance of identification cards, known as *matrículas consulares* (MC) or consular registration card. *Matrículas consulares* are issued to individuals living abroad, follow the same security standards as the Mexican passport, and can serve as identification in the United States (Riosmena and Massey 2010).[18] As shown in columns one and two of Appendix Table A1, the alternative instruments generate first stage coefficients that are very close to those from the EMIF. The fact that three different data sources result in similar predictions of net migration provides reassurance on the persistence of migration networks.[19]

5 Second Stage

The second stage results are shown in Table 3. The coefficients capture the changes in labor market outcomes in a given quarter to predicted migration over the previous four

[17] We also note that there is a high level of correlation in the weights across different years in the EMIF. The correlation in the weights between the first year in the EMIF (1995) and one of the later years we do not use (2011) is .83.

[18] Mexican consulates began issuing these certificates in 1871. `http://www.ime.gob.mx/es/estadisticas-de-mexicanos-en-estados-unidos`. Both legal and illegal immigrants can apply for them, and it is estimated that 40% of all Mexicans living in the U.S. have one. Correspondence from Direccion IME Global on 17th July 2014.

[19] We also assess the robustness of our instrument to removing the largest sending Mexican states and the largest receiving U.S. states. As shown in Appendix Table A1, we continue to find positive and significant first stage coefficients, suggesting our results are not driven by a few states.

quarters. We have not re-scaled net migration, such that a value of 1 constitutes a net migration rate of 100%. Thus to interpret all coefficients we use a one standard deviation change in 4 quarter net migration, which is 0.003, or 0.3% (the mean value is 0.23%). We also use the example of a *decrease* in net migration, as this is the trend we are analyzing.

First we find that a decrease in net migration leads to a significant decrease in the probability of employment among *men* and an increase among *women*. As shown in Table 3 column one, a one standard deviation decrease in net migration leads to a 1.8% decrease in the probability of employment for men and a 0.6% increase in the probability for women. These changes mirror those of labor force participation, which show significant declines for men but increases for women. These results align with a story in which men face greater competition for jobs, some get discourage and drop out of the labor force, while others face fewer employment prospects, and women are more likely enter the labor force to make up for lost remittance income.

Second, we find that for both men and women there is no evidence that individuals intensify their work, as there is no significant effect on weekly hours worked. We do find however, evidence of changes in job type. For men we find that net migration decreases the incidence of formal employment by 1.5%, in line with the informal sector absorbing some of the increased supply of male labor (column 3). What these jobs look like, however, is less clear, as we also find a significant decrease in the incidence of self-employment and an increase in the incidence of salaried work (columns 4-5). This suggests that the increase in informal jobs is driven by informal firms hiring workers rather than individuals starting their own businesses.

For women we find an opposite story, as declining migration increases the incidence of

formal work by 1.9%. While we find no significant declines in self-employment for women, we do find significant decreases in unpaid work, which women are much more likely to do than men. We also find an estimated increase in salaried work of 3% is 60% higher than the estimated response for men. This is consistent with the idea that women use labor markets to make up for lost remittance income, seeking out more stable and higher paid work. It also suggests that, on average, women are not turning to self-employment in the informal sector to manage negative remittance shocks.

Third, we find that decreased net migration leads to significant *increases* in wages. As shown in column 8, a one standard deviation decrease in net migration leads to an increase in real hourly wage of of 2.58 pesos for men and 1.94 pesos for women. This constitutes 14% of mean values for men and 11% for women. The increase in wages is unexpected, as previous research finds that wages rise in the face of *increased* net migration instead of it's opposite (Mishra 2007). Given the segmentation in labor markets by skill, the extent to which this happens likely varies by worker type. To illuminate the story further we therefore investigate differences by education level in Section 5.1 below.

5.1 Heterogeneity by Education

We next investigate heterogeneity in responses by educational attainment. Migrants are not equally drawn from the education distribution, and while the measurement of education and the implications for selection varies across papers, the general consensus is that migrants come from the lower to middle of the education distribution. For Mexico, this means they have completed primary school and may have some secondary school (Mexico has 6 years of compulsory primary schooling and 3 years of lower secondary schooling).[20]

[20]IPUMS International, EDUMX description.

In the ENOE there are four education categories: less than a primary education; primary education completed; secondary education completed; and tertiary education.[21] Would-be migrants should be more likely to have completed a primary or secondary education. We find evidence of this when we look at the characteristics of out-migrants, return migrants and non-migrants during the period of highest out migration in the ENOE (2005 and 2006). As shown in Table 4, in the ENOE out-migrants are more likely than non-migrants to have a primary or secondary education, but less likely to have less than primary or tertiary education.[22]

We also examine the composition of migrants by education as a portion of total migrants and the remaining population for the period of the sample. The results shown in Appendix Figure A1 indicate that migrants largely come from the lower to middle end of the education distribution. As shown in Panel A, those with a primary education or less make up the largest percentage of out migrants and, for the earlier part of the sample, constitute a larger percentage of those left behind. The left graph in Panel A also shows that while the rates of out migration relative to the population were higher for those with a primary education or less, they decline more for this group than for those with higher education. This means a likely higher increase in the population with a primary education

[21] These are the same categories used for IPUMS International for educational attainment. We use these categories for educational attainment in lieu of years of education, as it is difficult to map the latter into attainment given that individuals may skip or repeat grades. For reference, the summary statistics on years of education for each category is as follows: in the ENOE the mean years of education is 1.3 for less than primary school, 6.6 for primary completed, 9.8 for secondary completed, and 14.7 for tertiary completed.

[22] There is evidence that the educational selection of migrants changed as a result of the Great Recession, although there is disagreement over the direction of change. Villarreal (2014) finds evidence of more positive selection after the Great Recession, and argues that this is because the industries with the largest negative demand shocks, like construction, hire less educated workers. Thus migration declines the most for groups seeking low skill jobs in the U.S. Fajardo et al. (2017), however, argue that low income families are more likely to send *more* family members abroad in the face of shocks, while high income families are more likely to have migrants return home.

or less, leading to increased competition for jobs.

We next estimate outcomes separately by education level, showing the second stage results in Table 5. They show clear differences in labor market responses to net migration by education level. For employment we find that decreases in net migration only have a significant effect on those who have completed a primary or secondary education. This is the group who, ex-ante, is expected to most affected by increased competition for jobs. Meanwhile, while we find no significant impacts on hours worked, we do find significant impacts on hourly wage *only* for those with a tertiary education. The larger wage gains for those at the upper end of the education distribution aligns with a story in which the relative scarcity of college educated increases.

Following the distinction among men and women in our earlier results, we estimate results by sex and education in Figure 3. These results corroborate many of those discussed above. Specifically, the declines in employment and labor force participation are primarily among less well educated men. We see no change in employment for college educated men or women. Meanwhile the increases in wages are the highest for college educated men, followed by college educated women. We also see no change in wages for men or women with less than a secondary education. For women, most of the changes occur among those with a secondary education, where they are more likely to be employed in a salaried job and less likely to be doing unpaid work.

6 Robustness Checks

6.1 Adjustment to Previous Migration Shocks

Before concluding, in this section we address several concerns regarding the exclusion restriction in our model. One concern, raised by Jaeger et al. (2018), is that the instrument may be endogenous to labor market adjustments to past migration shocks. This may occur if there is little variation in the "shift" portion of the shift-share instrument, resulting in predicted migration flows that are highly persistent over time. The result is that the instrument assigns migrants to labor markets that are in the process of adjusting to past migration shocks, making it correlated with local labor market outcomes even if it is uncorrelated with contemporaneous productivity shocks.

Similar to Jaeger et al. (2018) we investigate the variation in the shift portion of our instrument by comparing the composition of our potential jobs measure across U.S. states and time.[23] We plot the percentage of potential jobs that come from each U.S. state in the first quarter of our sample (Q12005) to those shares in the last quarter of our sample (Q42012). As shown in Appendix Figure A2 most of the dots lie close to the 45 degree line, showing a high levels of persistence in the composition over time. We also find, similar to Jaeger et al. (2018) that our instrument is a better predictor of past migration than current migration, a further indication that the variation in the "shifts" is quite low (See Appendix Table A2).

To address this concern we implement the multiple instrumentation procedure recom-

[23]This is equivalent to examining the composition of migrants by country of origin in the Jaeger et al. (2018) case.

mended by Jaeger et al. (2018). Using the following specification:

$$
\begin{aligned}
Outcome_{isqy} = \beta_0 \quad &+ \quad \beta_1 \Big(\frac{NetMigration}{Population} \Big)_{\sum_{t=-1}^{-2} sqy-t} \\
&+ \quad \beta_2 \Big(\frac{NetMigration}{Population} \Big)_{\sum_{t=-3}^{-4} sqy-t} \\
&+ \quad X'_{sy}\gamma + Z'_{iqy}\lambda + \delta_q + \delta_y + \delta_s + \epsilon_{isqy}
\end{aligned} \tag{5}
$$

Where we estimate outcome for individual i, in Mexican state s, quarter q, year y as a function of the net migration rate for the previous two quarters for a given state, year and quarter. Given the lagged nature of our data, to not lose the years 2005 and 2006 when there is the steepest decline in migration, we use two quarters instead of four.[24] Results for the above specification are shown in Table 6. For men the results are robust to those in reported in Table 3 in direction and significance. Formal employment is still decreasing, but it is no longer statistically significant. For women the results are also consistent in direction but for two variables, formal employment and salaried, they are no longer statistically significant. Overall, the main findings remain, men are finding it harder to be employed and they seek more stable jobs by moving into salaried jobs and out of self-employment; while women are more likely to enter the labor force and find employment and they move out of unpaid jobs.

6.2 Internal Migration

We also examine internal migration, which can be a confounding factor if individuals with particular labor market outcomes move in response to net migration rates. In addition to the concern over selection, workers whose abundance increases as a result of declining net migration (say less well educated men) may move to states where there has been

[24] Equivalent results to those reported in Table 3 using two quarters, are available upon request.

no change in the number of workers in a particular group. If this happens our results may confound the short-run supply effect with the longer run effect of workers moving to markets where the reduction in migration has not been as strong (Jaeger et al. 2018).

First, we use the ENOE to examine if there have been changes in internal migration, particularly from high migration states. Internal migrants are defined as individuals who do not live in their state of birth. This is the only way to categorize internal migrants as the ENOE does not contain residency history. We follow Hanson (2007) and define high migration states as the 6 states with the highest historic rates of international migration (Aguascalientes, Durango, Guanajuato, Michoacán, San Luis Potosí and Zacatecas).[25] The left graph in Figure 4 shows total internal migrants and internal migrants from high-migration states to *non high migration* states. It shows that while internal migration has grown, the total from high migration states have not. This shows there has been no systematic increase in internal migrants from high migration states over the time period we consider. This finding is further corroborated in the right graph in Figure 4, which shows total population and internal migration rates for high migration states. The figure shows a clear increase in total population for these states, but a steady decline in internal migrants as a percentage of the population.[26]

Finally, we test if internal migration is a confound by re-estimating the model on the sample of individuals who live in their state of birth. The results of the second stage are shown in Panels A and B of Table 7. In general we find no change in our results, which means that internal migrants do not drive our findings.

[25]To clarify, internal migrants from high migration states are individual who were born in Aguascalientes, Durango, Guanajuato, Michoacán, San Luis Potosí or Zacatecas but currently live in a non-high migration state.

[26]We also estimate internal migration total and rates at the state level as a function of a linear and quadratic time trend and find that neither is significant.

6.3 Covariate shocks

There also is the concern that our instrument is endogenous if demand shocks in different U.S. states are correlated with employment conditions in the sending Mexican states. In particular, employment by industry in U.S. states may be linked to employment by industry in Mexican states. It is important to highlight that a violation of the exclusion restriction stems from possible correlations between sending and receiving *states* in the industry demand shocks, not from correlations between the U.S. and Mexico *overall*. This is because industry employment changes are not the same across all U.S. states, and Mexican states do not send migrants equally to all U.S. states. Thus each Mexican states is exposed to different demand shocks in the U.S.

To estimate the correlation between employment by industry we calculate employment trends from the first quarter in 2006 for the top four industries that employ Mexican born men in the U.S.; agriculture, construction, manufacturing and retail. We then graph these trends for the two largest receiving states in the U.S.– California and Texas– and the two largest sending states for each of these U.S. states. These are Michoacán for California and Guanajuato for Texas. The results are presented in Figure 5. A horizontal line is placed at 1 to represent no change in employment from the beginning of our sample in a given industry. Overall the graphs show very little correlation in employment trends across any of the 4 states, as there is no systematic expansion or contraction in employment for any time period considered. This provides anecdotal evidence that the correlation between demand shocks is low.

We next formally estimate correlations for employment trends and shares between industry employment across sending and receiving states. We first calculate each employ-

ment trend and share for each Mexican state, quarter and year using the ENOE. We next calculate employment shares and trends of receiving states by industry, state, quarter and year using the monthly CPS. We create a composite receiving state industry-employment trend and share by allocating these variables based on the EMIF weights used to construct the instrument. For example, we calculate the portion of total jobs that are in construction for every U.S. state and time period. How much each construction employment share matters, however, depends on how many migrants from a given Mexican state are in that particular U.S. state. We construct employment shares to abstract from the relative size of labor markets. We need to control for the size of a U.S. state so that large states, like California, do not dominate the measure. Finally, we regress each Mexican state employment share or trend on the composite receiving state employment share or trend, respectively. The regression coefficient captures the correlation between between employment shares or trends in a particular Mexican state, industry and time period and employment shares or trends in those industries in the U.S. states where migrants from that state are received.[27]

The results of these regressions are shown in Appendix Table A3 and provide further evidence that there is little correlation between industry employment in sending and receiving states. For employment shares we find a coefficient that is positive but quite low. A one standard deviation change in the composite employment share for an industry in receiving states (0.033 or 3.3%) is associated with an increase in that industry's share in a sending state of 0.0006, or 0.06%. This constitutes only 1.3% of the mean. For employment trends we find a negative and small coefficient. A one standard deviation

[27]We estimate: $EmploymentShare_{isqy}=\beta_0+\beta_1\ CompositeReceivingEmploymentShare_{isqy}+u_{isqy}$

decrease in the composite employment trend (relative to Q12006) is associated with an 0.003 increase, a value that is 0.3% of the mean. This provides further evidence that, given our weighting mechanisms, changes in industry employment in the U.S. are largely uncorrelated with employment shocks in sending Mexican states.[28]

7 Conclusion

In this paper we examine the unprecedented decline in out migration and its impacts on Mexican labor markets. The combination of more individuals in Mexico and the decline in remittance income may impact whether or not non-migrants work, as well as the type of work they do, the number of hours they work, and the wages they earn. Furthermore, since migrants are not drawn equally from the population, the degree of these impacts likely varies across individuals based on their characteristics and reliance on remittances.

We use data from the rotating labor force surveys (the ENOE) to estimate the impacts of declining net migration. A key challenge to estimating these impacts stems from the possibility that local labor market conditions determine both out-migration and the outcomes of non-migrants. We therefore use an instrumental variables strategy that isolates demand for Mexican labor in U.S. labor markets. Our instrument relies on historical migration patterns from sending Mexican states to receiving U.S. states and uses the variation in labor demand and locations to predict exogenous net migration rates.

Our findings indicate that the decline in migration reduced employment for lower educated men and increased wages for higher educated men and women. These results are in line with a model where migrants are substitutes of less educated non-migrant men

[28] We find a coefficient of 0.186 if we use weights summed by Mexican state. This means that a one standard deviation change in the composite employment share is associated with a sending state's employment share of 0.6%, or 13% of the mean.

and complements of higher educated men and women.

We also find that among those employed, the type of work changes as self-employment declines and salaried jobs increase. Women additionally are less likely to have unpaid jobs and more likely to enter the labor force. This aligns with a story in which declining remittances lead other family members, particularly women, to seek more stable and well paid employment. Interestingly this does not happen through increased hours worked, but rather through a change in job type.

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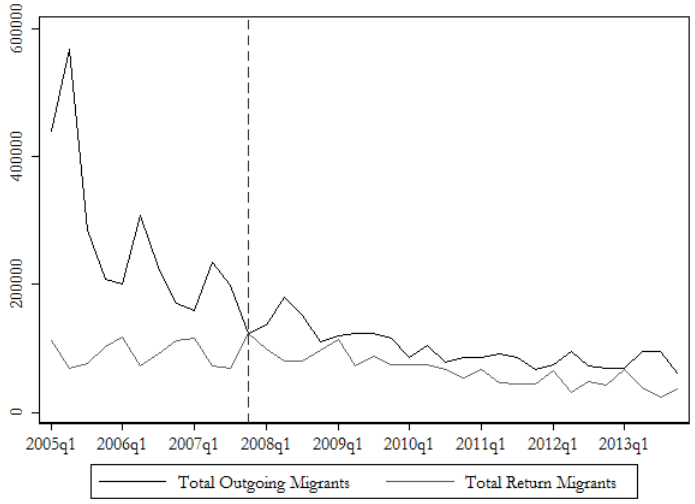
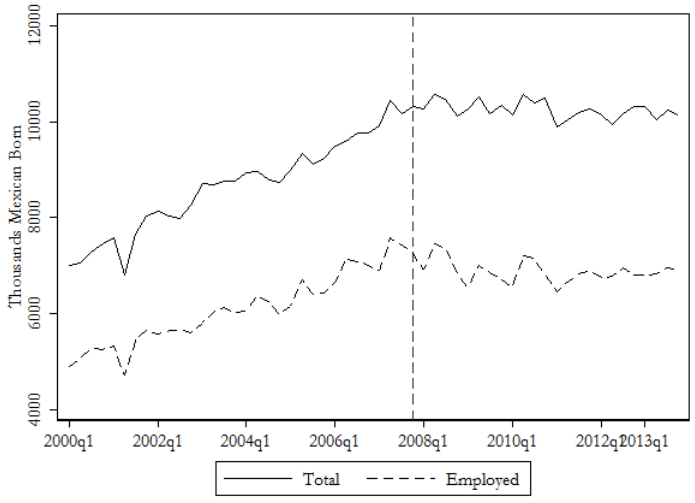
8 Figures and Tables

Figure 1: Out and Return Migration in Mexico, Q12005-Q42013



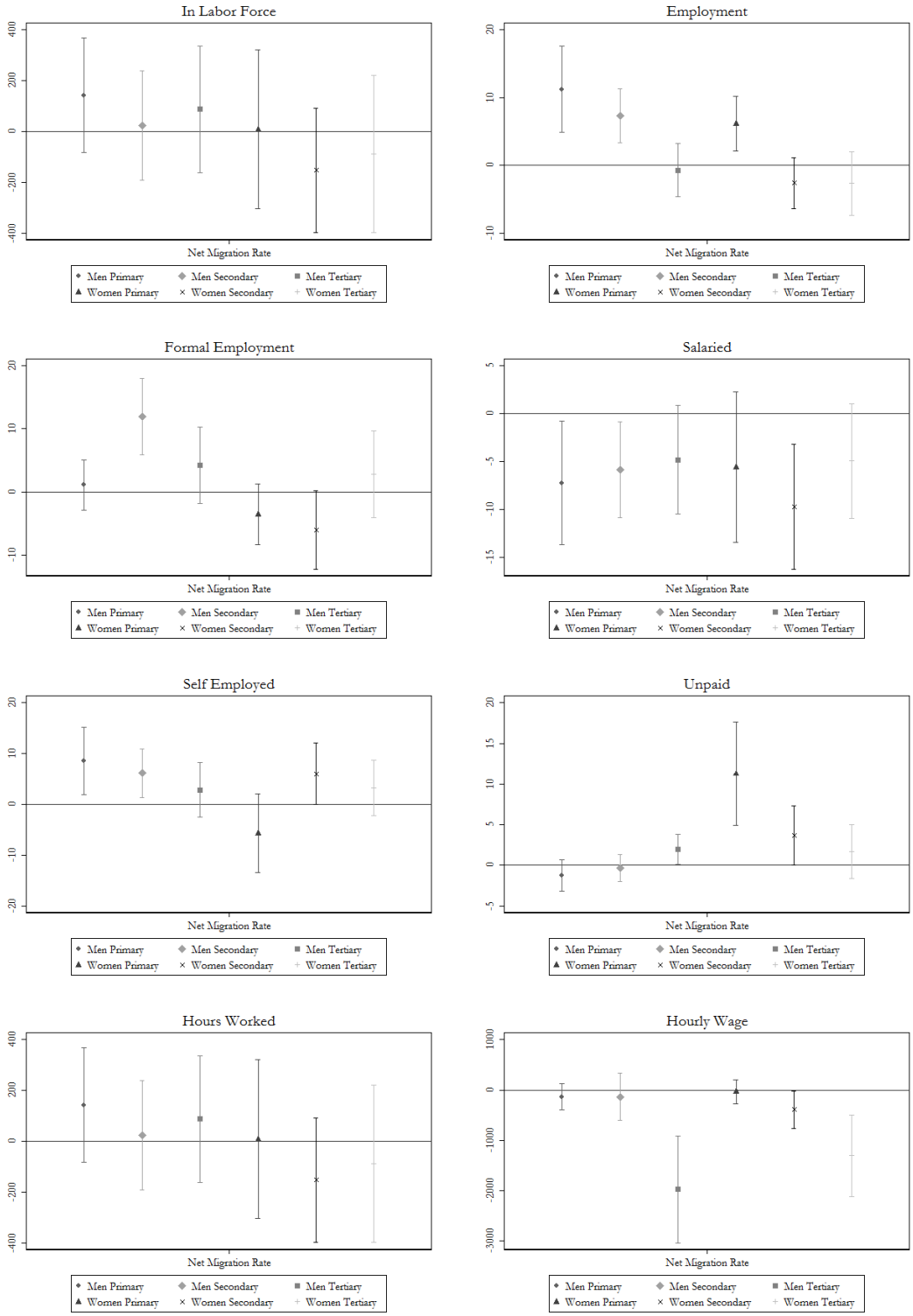
Note: Net migration rate calculated as (out migration-return migration)/non-migrant population for a given quarter. Vertical line placed in Q42007, which marks the beginning of the Great Recession.
Source: ENOE.

Figure 2: Working Age Mexican Born Population in the U.S., Q12000 to Q42013



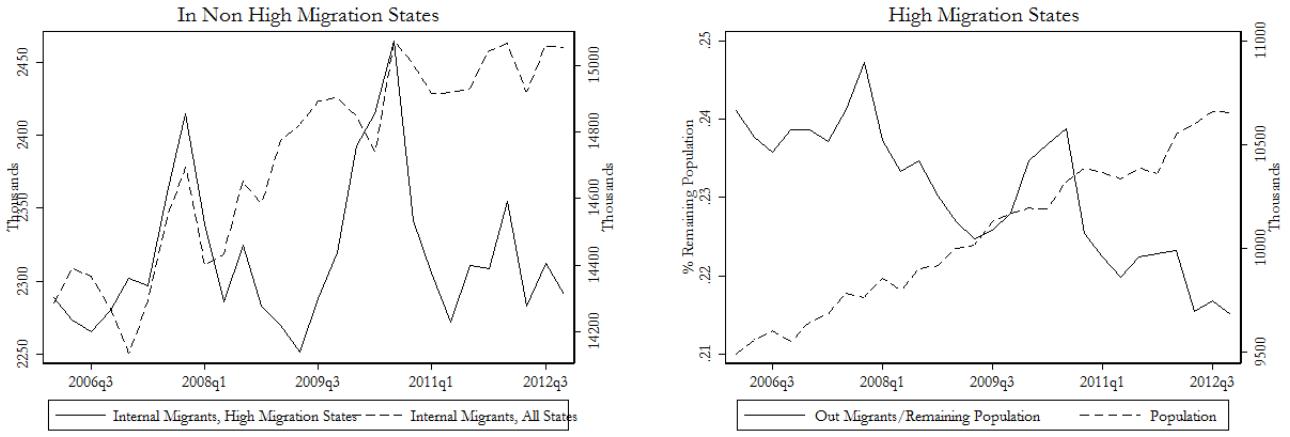
Note: Working age defined as 18 to 65. Vertical line placed in Q42007, which marks the beginning of the Great Recession.
Source: Current Population Survey, as accessed by IPUMS CPS.

Figure 3: Response to Net Migration Rates by Education and Sex



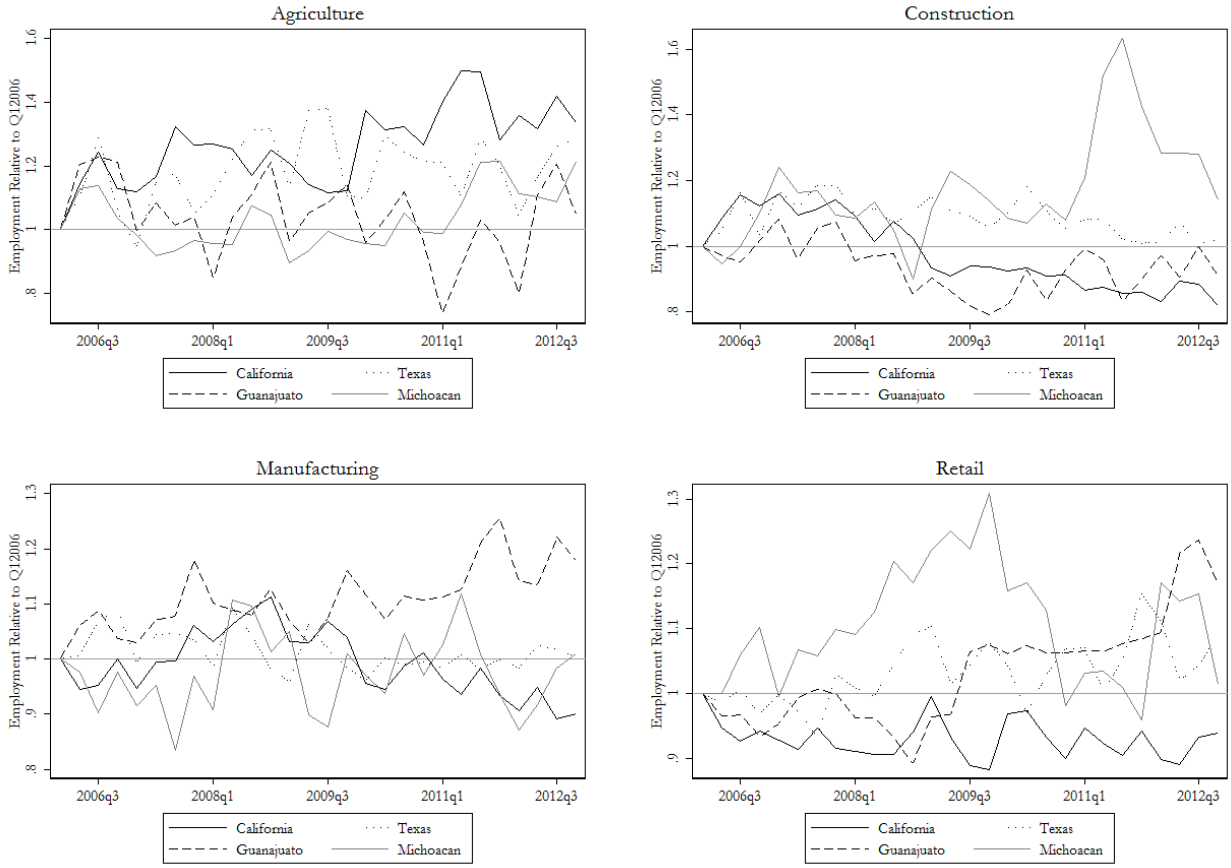
Note: Dots represent second stage IV coefficient on net migration rates. Lines show the 95% confidence intervals, with standard errors clustered at the state-quarter-year level. Controls include state, quarter and year fixed effects, individual-time varying controls and state-time varying controls. In all cases population weights are used.
Source: ENOE, INEGI, EMIF, CPS and U.S. 2000 Census.

Figure 4: Trends in Internal Migration



Note: The list of high migration states is taken from Hanson (2007). They are: Aguascalientes, Durango, Guanajuato, Michoacán, San Luis Potosí and Zacatecas.
Source: ENOE.

Figure 5: Trends in Employment for top 4 Industries for Mexican born men



Source: CPS and ENOE.

Table 1: Summary Statistics Labor Force

	(1) All	(2) Men	(3) Women
Employed	0.64	0.83	0.47
	(0.48)	(0.37)	(0.50)
Unemployed	0.03	0.04	0.02
	(0.17)	(0.19)	(0.14)
Of Those Employed			
Formal worker	0.38	0.38	0.39
	(0.49)	(0.49)	(0.49)
Weekly hours worked	41.93	45.15	36.58
	(18.42)	(17.75)	(18.25)
Hourly wage (2005 pesos)	18.58	18.97	17.92
	(31.21)	(32.05)	(29.78)
Type of Job			
Salaried	0.68	0.69	0.66
	(0.47)	(0.46)	(0.47)
Self employed	0.27	0.29	0.25
	(0.45)	(0.45)	(0.44)
Unpaid	0.05	0.03	0.08
	(0.22)	(0.16)	(0.28)
Education			
Primary education or less	0.40	0.37	0.42
	(0.49)	(0.48)	(0.49)
Completed high school	0.31	0.30	0.32
	(0.46)	(0.46)	(0.46)
More than high school	0.28	0.31	0.26
	(0.45)	(0.46)	(0.44)
Observations	5,137,663	2,482,537	2,655,126

Population weighted mean values reported. Standard deviations in parentheses
Source:ENOE

Table 2: First Stage IV Results

	Demand Measure	Alternative Demand Measures	
	(1) Potential Jobs	(2) Total Employment	(3) Employment Rates
Predicted Migration	0.0280***	0.0026***	0.0090***
	(0.0059)	(0.0006)	(0.0026)
Observations	5,137,379	5,137,379	5,137,379
A-P F stat	22.32	20.74	12.27

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Note: Coefficients on the instrumental variable for net migration shown. Controls include state, quarter and year fixed effects, marital status and household size, and state-year real GDP per capita and state-quarter employment rates. In all cases population weights are used and standard errors are clustered at the state-quarter-year level.

Source: ENOE, CPS and the US Census 2000, as accessed through IPUMS, the EMIF, and INEGI.

Table 3: Second Stage IV Results

			Of Those Who Are Employed					
	(1) In Labor Force	(2) Employed	(3) Formal Employment	(4) Salaried	(5) Self Employed	(6) Unpaid	(7) Hours Worked	(8) Hourly Wage
PANEL A: MEN								
Net Migration Rate	3.667***	6.057***	5.129***	-6.113***	6.124***	-0.011	108.105	-863.966***
	(1.252)	(1.624)	(1.781)	(2.001)	(2.052)	(0.562)	(85.133)	(233.430)
Observations	2,482,381	2,482,381	2,053,493	2,053,493	2,053,493	2,053,493	2,053,493	2,053,493
PANEL B: WOMEN								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Net Migration Rate	-3.389**	-2.104**	-6.416***	-10.146***	3.019	7.127***	-99.422	-646.693***
	(1.337)	(1.026)	(2.345)	(2.939)	(2.075)	(1.845)	(106.858)	(183.077)
Observations	2,654,998	2,654,998	1,307,205	1,307,205	1,307,205	1,307,205	1,307,205	1,307,205

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

Note: Coefficients on the IV estimate on the net migration rate over the previous four quarters are shown. Controls include state, quarter and year fixed effects, marital status and household size, and state-year real GDP per capita and state-quarter employment rates and industrial activity. In all cases population weights are used and standard errors are clustered at the state-quarter-year level.

Source: ENOE, CPS and the US Census 2000, as accessed through IPUMS, the EMIF, and INEGI.

Table 4: Characteristics of Migrants in the ENOE

	(1) Non-Migrants	(2) Out Migrants	(3) Return Migrants
Woman	0.53	0.02	0.16
	(0.50)	(0.13)	(0.37)
Age	36.58	29.56	32.33
	(16.37)	(11.75)	(12.18)
Employed	0.57	0.81	0.56
	(0.50)	(0.39)	(0.50)
In Labor Force	0.59	0.86	0.67
	(0.49)	(0.35)	(0.47)
Years of Education	8.08	7.62	7.60
	(4.55)	(3.71)	(3.66)
Education Level			
Primary or Less	0.50	0.53	0.53
	(0.50)	(0.50)	(0.50)
Secondary Completed	0.30	0.32	0.33
	(0.46)	(0.47)	(0.47)
Tertiary Completed	0.20	0.14	0.13
	(0.40)	(0.35)	(0.34)
Observations	1,829,096	10,767	1,392

Population weighted mean values reported. Standard deviations in parentheses
Source:ENOE, Years 2005 and 2006

Table 5: Heterogeneity by Education Level

			Of Those Who Are Employed					
	(1) In Labor Force	(2) Employed	(3) Formal Employment	(4) Salaried	(5) Self Employed	(6) Unpaid	(7) Hours Worked	(8) Hourly Wage
PANEL A: Primary or less								
Net Migration Rate	2.319*	4.228***	-0.809	-7.152**	3.558	3.595***	25.604	-106.420
	(1.286)	(1.499)	(1.738)	(3.004)	(2.383)	(1.314)	(109.956)	(110.671)
Observations	1,836,781	1,836,781	1,099,969	1,099,969	1,099,969	1,099,969	1,099,969	1,099,969
PANEL B:Secondary								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Net Migration Rate	-0.093	2.181*	5.354**	-6.743***	5.667***	1.076	-16.023	-228.350
	(1.234)	(1.209)	(2.087)	(2.335)	(2.096)	(0.913)	(90.381)	(176.824)
Observations	1,596,601	1,596,601	1,090,970	1,090,970	1,090,970	1,090,970	1,090,970	1,090,970
PANEL C: Tertiary								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Net Migration Rate	-4.427**	-2.294	4.391*	-4.198*	2.396	1.801*	3.196	-1741.101***
	(1.934)	(1.566)	(2.465)	(2.193)	(2.027)	(0.954)	(114.773)	(470.893)
Observations	1,640,247	1,640,247	1,167,856	1,167,856	1,167,856	1,167,856	1,167,856	1,167,856

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

Note: Coefficients on the IV estimate on the net migration rate shown. Controls include state, quarter and year fixed effects, marital status and household size, and state-year real GDP per capita and state-quarter employment rates and industrial activity. In all cases population weights are used and standard errors are clustered at the state-quarter-year level.

Source: ENOE, CPS and the US Census 2000, as accessed through IPUMS, the EMIF, and INEGI.

Table 6: Second Stage IV Results, 2Q Migration Plus One Period Lag

			Of Those Who Are Employed					
	(1) In Labor Force	(2) Employed	(3) Formal Employment	(4) Salaried	(5) Self Employed	(6) Unpaid	(7) Hours Worked	(8) Hourly Wage
PANEL A: MEN								
Net Migration Rate	12.506*	17.985*	9.166	-20.784*	23.150*	-2.365	482.680	-2479.657*
	(7.165)	(9.310)	(6.432)	(12.073)	(13.280)	(2.351)	(318.363)	(1299.146)
Net Migration Rate, Q-2	0.063	1.192	3.430	0.050	-1.027	0.977	-49.204	-185.030
	(2.102)	(2.820)	(2.128)	(3.569)	(3.978)	(0.671)	(98.160)	(382.499)
Observations	2,482,381	2,482,381	2,053,493	2,053,493	2,053,493	2,053,493	2,053,493	2,053,493
A-P F statistic	1.92	1.92	2.02	2.02	2.02	2.02	2.02	2.02
PANEL B: WOMEN								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Net Migration Rate	-11.377*	-8.390*	-13.139	-20.396	6.900	13.496*	-111.775	-1279.009*
	(6.410)	(4.872)	(9.742)	(12.773)	(7.613)	(7.525)	(320.049)	(732.483)
Net Migration Rate, Q-2	-0.044	0.527	-3.708	-6.017*	1.457	4.560**	-94.316	-391.976*
	(1.954)	(1.483)	(2.464)	(3.222)	(1.763)	(2.184)	(107.405)	(206.221)
Observations	2,654,998	2,654,998	1,307,205	1,307,205	1,307,205	1,307,205	1,307,205	1,307,205
A-P F statistic	2.13	2.13	2.02	2.02	2.02	2.02	2.02	2.02

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

Note: Coefficients on the IV estimate on the net migration rate over the previous two quarters are shown. Not shown are coefficients on a one period (2 quarter) lag in net migration rates. Controls include state, quarter and year fixed effects, marital status and household size, and state-year real GDP per capita and state-quarter employment rates and industrial activity. In all cases population weights are used and standard errors are clustered at the state-quarter-year level.

Source: ENOE, CPS and the US Census 2000, as accessed through IPUMS, the ENE, and INEGI.

Table 7: Robustness Checks

			Of Those Who Are Employed					
	(1) In Labor Force	(2) Employed	(3) Formal Employment	(4) Salaried	(5) Self Employed	(6) Unpaid	(7) Hours Worked	(8) Hourly Wage
PANEL A: Non Movers Men								
Net Migration Rate	3.841***	6.287***	5.393***	-5.770***	6.145***	-0.375	36.793	-740.596***
	(1.328)	(1.725)	(2.002)	(2.065)	(2.129)	(0.678)	(85.051)	(227.429)
Observations	1,952,325	1,952,325	1,611,663	1,611,663	1,611,663	1,611,663	1,611,663	1,611,663
A-P F statistic	20.72	20.72	21.27	21.27	21.27	21.27	21.27	21.27
PANEL B: Non Movers Women								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Net Migration Rate	-3.661**	-2.463**	-4.849**	-6.903***	-0.511	7.413***	-82.415	-651.704***
	(1.462)	(1.129)	(2.357)	(2.661)	(2.127)	(2.143)	(114.626)	(203.344)
Observations	2,101,215	2,101,215	1,030,160	1,030,160	1,030,160	1,030,160	1,030,160	1,030,160
A-P F statistic	19.93	19.93	18.91	18.91	18.91	18.91	18.91	18.91

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

Note: Panels A and B excludes potential movers, defined as individuals who do not live in their state of birth. Panel C include a linear time trend and additional state-year industry controls. Coefficients on the IV estimate on the net migration rate over the previous four quarters are shown. Controls include state, quarter and year fixed effects, marital status and household size, and state-year real GDP per capita and state-quarter employment rates and industrial activity. In all cases population weights are used and standard errors are clustered at the state-quarter-year level.

Source: ENOE, CPS and the US Census 2000, as accessed through IPUMS, the EMIF, and INEGI.

Appendix

Table A1: Robustness Checks, First Stage IV Results

	Alternative Weights			Time Period	
	(1)	(2)	(3)	(4)	(5)
	ENE	MC	Historic	No Main Receiving State	No Main Sending State
Predicted Migration	0.0348***	0.0615***	0.0181	0.0329***	0.0194***
	(0.0060)	(0.0075)	(0.0144)	(0.0067)	(0.0064)
Observations	5,137,379	5,137,379	5,137,379	5,137,379	4,825,347
A-P F stat	33.21	66.47	1.59	24.04	9.18

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Note: Coefficients on the instrumental variable for net migration shown. Controls include state, quarter and year fixed effects, marital status and household size, and state-year real GDP per capita and state-quarter employment rates and industrial activity. The regressions in column two include controls for the percentage of a state's workforce, by quarter and year, that is employed in one of 11 industries, as defined by two digit code. The regressions in column three includes a linear time trend as well as an index of industrial activity, measured by state, quarter and year. In all cases population weights are used and standard errors are clustered at the state-quarter-year level.

Source: ENOE, CPS and the US Census 2000, as accessed through IPUMS, the EMIF, and INEGI.

Table A2: Instrument Diagnostic Check

	Actual Migration Rate				
	(1) Current Quarter	(2) Lag 1 Quarter	(3) Lag 2 Quarters	(4) Lag 3 Quarters	(5) Lag 4 Quarters
Instrumental Variable					
Predicted 4Q Migration, Current Quarter	0.031***	0.042***	0.050***	0.056***	0.062***
	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
Observations	896	896	864	832	800
	(1)	(2)	(3)	(4)	(5)
Predicted 2Q Migration, Current Quarter	0.010***	0.021***	0.028***	0.031***	0.033***
	(0.004)	(0.003)	(0.004)	(0.004)	(0.004)
Observations	992	960	928	896	864

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Note: Coefficients on the OLS estimate on the net migration rate over the previous four quarters are shown. Controls include state, quarter and year fixed effects.

Source: ENOE, CPS and the US Census 2000, as accessed through IPUMS, the EMIF, and INEGI.

Table A3: Correlation of Industrial Employment

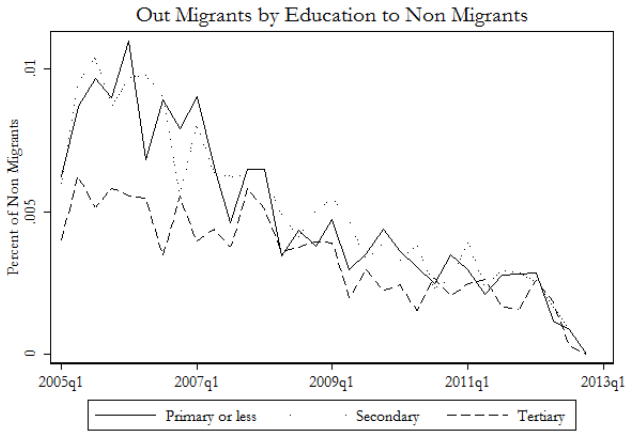
	Industry Employment Share		Industry Employment Trends	
	(1)	(2)	(3)	(4)
	Same Quarter	1 Quarter Lag	Same Quarter	1 Quarter Lag
Average Receiving State				
Employment Share	0.018	0.018		
	(0.002)***	(0.002)***		
Employment Trend			-0.010	-0.010
			(0.002)***	(0.002)***
Observations	9,856	9,504	9,856	9,504
R^2	0.01	0.01	0.00	0.00

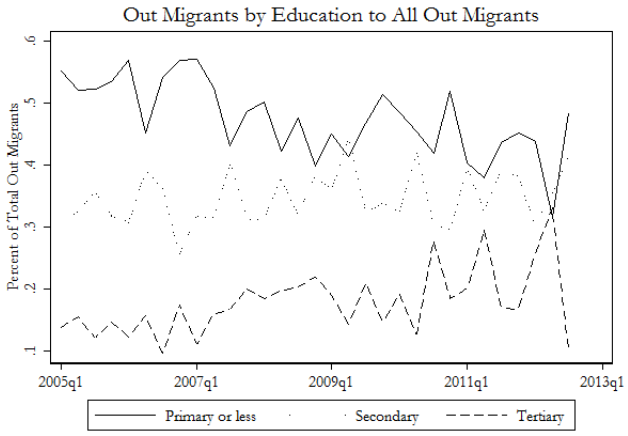
* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Source: ENOE, CPS and the US Census 2000, as accessed through IPUMS, the ENE, and INEGI.

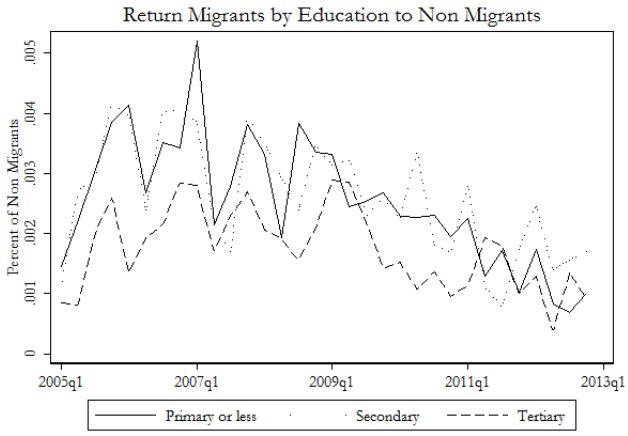
Figure A1: Composition of Out and Return Migrants by Education

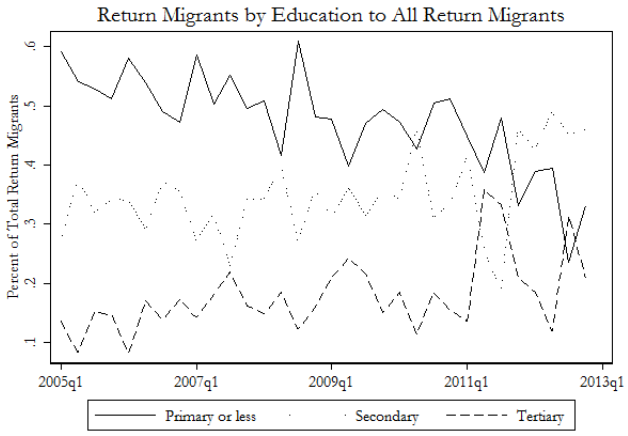
Panel A: Out Migrants





Panel B: Return Migrants





Source: ENOE.

Figure A2: Correlation of Potential Job Shares