Preliminary

International Migration, Self-Selection, and the Distribution of Wages: Evidence from Mexico and the United States

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Abstract. In this paper, we use the 1990 Mexico and U.S. population censuses to examine who migrates from Mexico to the United States and how the performance of these individuals compares to those who remain in Mexico. This approach allows us to test, using data from a migrant-sending country, Borjas' negative-selection hypothesis that in poor countries individuals with the greatest incentive to migrate abroad are those with below-average skill levels. We find that 1) Mexican immigrants, while much less educated than U.S. natives, are on average more educated than residents of Mexico, 2) projected U.S.-Mexico wage differentials, while large for all individuals, decline with age and with the level of schooling, and 3) were Mexican immigrants in the United States to be paid according to wage determination patterns in Mexico they would tend to fall within the upper half of Mexico's wage distribution. Our results do not support the negative-selection hypothesis (at least for observable characteristics) and suggest that migration may raise wage dispersion in Mexico. Migration costs associated with illegal immigration may account for the observed patterns of migrant selection in Mexico.

1. Introduction

During the last three decades, the United States has experienced rising levels of immigration from poor countries.[1] This has made the U.S. labor force larger, younger, and less-educated than it otherwise would have been (Smith and Edmonston, 1997; Borjas, 1999a). The shift in the composition of immigrants appears to have been helped by changes in U.S. immigration policy embodied in the 1965 Immigration Act, which relaxed long-standing country-of-origin restrictions on immigrant admissions.

More open immigration policies have in principle allowed a wider cross-section of individuals to move to the United States. In an important strand of literature, Borjas (1987) uses the Roy (1951) model to argue that which individuals choose to migrate to the United States from a particular country will depend on how that country's wage distribution compares to the United States'. In poor countries, where the returns to education and the dispersion of wages are presumably relatively high, there will be a "negative selection" of immigrants. Those with the greatest incentive to migrate will tend to be those with below-average skill levels relative to their country-of-origin compatriots.[2] In rich countries, where returns to education and wage dispersion are presumably relatively low, there will be "positive selection" of immigrants. Those with the greatest incentive to move to the United States will tend to be those with above average skill levels. In support of this selection hypothesis, Borjas (1987, 1995) finds that as sources for U.S. immigration have shifted from rich to poor countries, the average economic performance of new immigrants has deteriorated. Relative to earlier cohorts,

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[1] Europe has also seen rising immigration levels overall and from poor countries in particular. See Boeri, Hanson, and McCormick (2002) for an overview.

[2] As long as ability and educational attainment are positively correlated, which is generally presumed to be the case, negative selection from poor countries (and positive selection from rich countries) will occur in terms of both observable skills, such as schooling, and unobservable skills, such as unmeasured ability.

recent immigrants from poor countries earn lower wages compared to natives at time of arrival and take longer to have their earnings converge to those of natives.[3]

In another strand of literature, there have been attempts to link recent changes in the level and composition of immigration to rising U.S. wage inequality. One common approach has been to regress changes in wages for U.S. natives on changes in the stock of immigrants in a cross section of U.S. metropolitan areas. Most studies find that immigration inflows are only weakly negatively correlated with wage changes for low-skilled U.S. natives (see Smith and Edmonston, 1997; and Borjas, 1999a,b, for surveys). Borjas, Freeman, and Katz (1997) suggest that cross-city wage regressions of this type will identify the impact of immigration only under a restrictive set of assumptions. Using factor-content calculations, they find larger effects of immigration on the wages of very low-skilled U.S. natives, but this approach too has been subject to criticism (Deardorff, 2000; Leamer, 2000). While the prior of many observers is that recent U.S. immigration has raised wage inequality, the evidence remains in dispute.

Largely missing in the discussion of the causes and consequences of immigration is the perspective of source countries.[4] Does evidence on migration from poor countries support the negative-selection hypothesis? Has immigration tended to narrow or widen the distribution of wages in source countries? In this paper, we use data from the Mexico

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[3] Identifying the average quality of immigrant cohorts is complicated by the fact that multiple events occur simultaneously: unobserved cohort quality may change, immigrants may through assimilation improve their economic performance relative to natives, and labor-market shocks may have non-uniform effects on individuals at different points in the wage distribution. See LaLonde and Topel (1992), Borjas (1999b), Butcher and DiNardo (2002) for differing approaches in how to deal with this issue.

[4] A large case-study literature examines the impact of migration on sending communities in Mexico (see Durand and Massey, 1992; and Espenshade, 1995 for surveys). This and related bodies of work tends to focus on specific regions in Mexico (e.g., Massey, Goldring, and Durand, 1994; Orrenius, 1999; Orrenius and Zavodny, 2001; Hanson, Robertson, and Spilimbergo, 2002) and not on the country as a whole. Exceptions include Cornelius and Marselli (2001), Durand, Massey and Zenteno (2001), Mexico-United States Binational Migration Study (1998), Robertson (2000), and Woodruff and Zenteno (2002).

population census and data on Mexican immigrants in the U.S. population census to examine who migrates to the United States and how the performance of these individuals compares to those who remain in Mexico. Mexico is an obvious choice in which to examine migration to the United States. It is the largest source country for U.S. immigrants. In 2000 Mexican-born individuals accounted for 27.7% of the foreign-born U.S. population, and during the 1990's Mexico accounted for 31.3% of new U.S. immigrants. The 2000 U.S. population of immigrants from Mexico was equivalent to 7.8% of the total population of Mexico. Relative to the United States, Mexico has higher returns to education and a higher dispersion of wages, making it an ideal candidate in which to test for the negative selection of migrants.

We first examine the selection of migrants in observable characteristics. Mexican immigrants, while much less educated than U.S. natives, are on average more educated than residents of Mexico. Mexican individuals with 12 to 15 years of schooling are the education group most likely to migrate to the United States. At all age and education levels wages for Mexican immigrants in the United States vastly exceed wages for residents of Mexico. With large wage differentials at all skill levels, migration costs determine who migrates. More-educated individuals will be more likely to migrate if their (time-equivalent) cost of migration is relatively low, as appears to be the case. That migrants have relatively high levels of schooling suggests that were Mexican immigrants in the United States to return to Mexico they would tend to fall in the upper half of the country's wage distribution. We confirm this intuition by constructing counterfactual wage densities, following DiNardo, Fortin, and Lemieux (1996) and Butcher and DiNardo (2002). Our results suggest that migration to the United States may raise wage dispersion in Mexico. Taken together with the Borjas, Freeman, and Katz (1997) finding that immigration lowers relative wages for low-skilled U.S. natives, international migration may increase wage inequality in both sending and receiving countries.

Next, we examine the selection of migrants in terms of unobservable skills. This involves an application of Heckman's (1979) correction for sample-selection bias. Since the data include observations on residents of Mexico who chose not to migrate to the United States and observations on Mexican-born individuals who chose to migrate to the United States, we can estimate whether the returns to unobserved characteristics for migrants are high or low relative to Mexican residents who do not migrate.

We account for the positive selection of migrants from Mexico by appealing to an important feature of Mexican migration to the United States. Given long queues for U.S. legal admission, over half of Mexican-born individuals entering the country do so as illegal immigrants. Enforcement against illegal immigrants acts as a head tax, disproportionately penalizing individuals with low skill levels. If more-skilled and less-skilled individuals from Mexico compete for jobs offered to illegal immigrants, it will be efficient, given fixed migration costs, to fill jobs with more skilled individuals first. We provide some evidence to support this view.

The paper has six sections. In section 2 we present theory on migrant self-selection. In section 3 we describe the characteristics and economic performance of Mexican immigrants in the United States and residents of Mexico. In section 4 we examine how Mexican immigrants in the United States would perform relative to Mexican residents were they to return to the country. In section 5 we test for the positive or negative selection of migrants from Mexico. In section 6 we conclude.

2. Theory

To motivate the empirical analysis, we give a simple exposition of the Roy (1951) model. Our treatment follows Borjas (1987, 1991, 1999), but differs from these in that we place greater emphasis on how mobility costs influence the composition of migrants. Individuals from Mexico, indexed by 0, choose whether or not to migrate to the United States, indexed by 1. For simplicity, we treat this as a one-time decision, though the extension to a dynamic setting is straightforward (see Sjaastad, 1964; Borjas, 1991). We begin by considering the composition of migrants in terms of observed skills and then consider the composition of migrants in terms of unobserved skills.

Residents of Mexico face a wage distribution given by

$$\ln(w_0) = \mu_0 + \delta_0 s + \varepsilon_0 \qquad (1)$$

where w_0 is the wage in Mexico, μ_0 is the zero-schooling mean wage in Mexico, s is the level of schooling, δ_0 is the returns to schooling in Mexico, and ε_0 captures deviations from mean earnings (e.g., the returns to unmeasured ability) in Mexico and has distribution $N(0, \sigma_0^2)$. To address migrant selection in terms of education, we initially treat schooling as a random variable, such that s has distribution

$$s = \mu_s + \varepsilon_s \qquad (2)$$

where μ_s is mean schooling and $\varepsilon_s \sim N(0, \sigma_s^2)$. If the population of Mexican residents were to migrate to the United States, they would face the wage distribution

$$\ln(w_1) = \mu_1 + \delta_1 s + \varepsilon_1 \qquad (3)$$

where w_1 is the U.S. wage for a migrant from Mexico, μ_1 is the zero-schooling mean wage for migrants from Mexico, δ_1 is the return to schooling for migrants from Mexico, and $\varepsilon_1 \sim N(0, \sigma_1^2)$. We assume that ε_0 and ε_1 are positively correlated (employers in both countries value similar characteristics) with correlation coefficient ρ_{01}.

Combining (1)-(3), a resident of Mexico will migrate to the United States if

$$\ln\left(\frac{w_1}{w_0 + C}\right) \approx (\mu_1 - \mu_0 - \pi) + \mu_s(\delta_1 - \delta_0) + (\varepsilon_1 - \varepsilon_0) + \varepsilon_s(\delta_1 - \delta_0) > 0 \quad (4)$$

where C is migration costs and π=C/w_0 is time-equivalent migration costs. Borjas (1987, 1999) assumes that π is constant, or that all individuals require the same number of labor hours in order to migrate to the United States. This assumption simplifies the analysis, but may be a poor reflection of reality. Following Borjas (1991), we assume that time-equivalent migration costs are a random variable with distribution

$$\pi = \mu_\pi + \varepsilon_\pi \quad (5)$$

where μ_π is mean migration costs and $\varepsilon_\pi \sim N(0, \sigma_\pi^2)$. The correlation coefficient for ε_π and ε_j is $\rho_{j\pi}$, j=0,1,s. By (4), the probability an individual migrates to the United States is

$$\Pr(v > -[\mu_1 - \mu_0 - \mu_\pi + \mu_s(\delta_1 - \delta_0)]) = 1 - \Phi(z) \quad (6)$$

where $v=(\varepsilon_1-\varepsilon_0 - \varepsilon_\pi)+\varepsilon_s(\delta_1-\delta_0)$ and $z=-[\mu_1-\mu_0-\mu_\pi+\mu_s(\delta_1-\delta_0)]/\sigma_v$. The probability in (6) gives the Mexico-to-U.S. migration rate (as long as not all Mexico residents move).

Will migrants from Mexico to the United States tend to be individuals with relatively high or low education levels? Given (1)-(6), the expected level of schooling for a Mexican migrant in the United States is

$$\begin{aligned} E(s \mid v > z) &= \mu_s + E(\varepsilon_s \mid v > z) \\ &= \mu_s + \left(\frac{\sigma_s^2}{\sigma_v}(\delta_1 - \delta_0) - \frac{\sigma_\pi \sigma_s}{\sigma_v}\rho_{s\pi} \right)\lambda(z) \end{aligned} \quad (7)$$

where $\lambda(z)$, the inverse Mills' ratio, equals $\phi(z)/[1-\Phi(z)]$. Migrants from Mexico will have above (below) average schooling relative to residents of Mexico if the term in the brackets on the right of (7) is positive (negative). While theory does not give an unambiguous prediction, we can sign some of the elements of this expression. It appears that returns to schooling in Mexico are higher than in the United States, or that $(\delta_1-\delta_0)<0$. Under this condition, migrants will have below-average schooling if $\rho_{s\pi}$, the correlation between schooling and time-equivalent migration costs, is not too negative, and above-average schooling if $\rho_{s\pi}$ is negative and large in absolute value relative to $|\delta_1-\delta_0|$.

There are several reasons to suspect that $\rho_{s\pi}<0$. First, individuals migrating legally to the United States must satisfy many bureaucratic requirements, involving extensive paperwork and repeated interactions with U.S. immigration authorities. More-educated individuals may be able to meet these requirements more easily. Also, a large service industry of lawyers and other specialists exists to help migrants manage the U.S. admissions process. The existence of a market for migration services suggests that the time-equivalent cost of migration will be lower for individuals with higher hourly wages (since it takes them fewer labor hours to pay for these services). Second, individuals migrating to the United States illegally must cross the border, find transport to a safe location in the United States, and obtain counterfeit residency documents. There is also a large industry that provides these services (Orrenius, 1999), again suggesting that high-wage individuals require fewer effective labor hours to migrate to the United States. While we cannot sign (7), there is a plausible case for migrants having above-average education levels. We leave it to the empirical analysis to resolve the issue.

We turn next to the self-selection of migrants in terms of unobserved characteristics. To motivate the empirical analysis, we condition wages on observed correlates of skill, including education, and rewrite equations (1) and (3) as

$$\ln(w_0) = X\delta_0 + \varepsilon_0 \tag{8}$$

and

$$\ln(w_1) = X\delta_1 + \varepsilon_1 \tag{9}$$

where X is a vector of observed characteristics that affect wages and δ_i captures the labor-market returns to these characteristics in country i. The probability that an individual migrates to the United States is now

$$\Pr(\hat{v} > -[X(\delta_1 - \delta_0) - \mu_\pi]) = 1 - \Phi(\hat{z}) \tag{10}$$

where $\hat{v}=\varepsilon_1-\varepsilon_0-\varepsilon_\pi$ and $\hat{z}=-[X(\delta_1-\delta_0)-\mu_\pi]/\sigma_v$. Expected wages for residents of Mexico who choose *not* to migrate to the United States equal

$$\begin{aligned} E(\ln(w_0) \mid \hat{v} < \hat{z}) &= X\delta_0 + E(\varepsilon_0 \mid -\hat{v} > -\hat{z}) \\ &= X\delta_0 + \left(\frac{\sigma_0\sigma_1}{\sigma_{\hat{v}}} \left(\frac{\sigma_0}{\sigma_1} - \rho_{01} \right) + \frac{\sigma_\pi\sigma_0}{\sigma_{\hat{v}}} \rho_{0\pi} \right) \lambda(-\hat{z}) \end{aligned} \tag{11}$$

and expected wages for Mexican migrates in the United States equal

$$\begin{aligned} E(\ln(w_1) \mid \hat{v} > \hat{z}) &= X\delta_1 + E(\varepsilon_1 \mid \hat{v} > \hat{z}) \\ &= X\delta_1 + \left(\frac{\sigma_0\sigma_1}{\sigma_{\hat{v}}} \left(\frac{\sigma_1}{\sigma_0} - \rho_{01} \right) - \frac{\sigma_\pi\sigma_1}{\sigma_{\hat{v}}} \rho_{1\pi} \right) \lambda(\hat{z}) \end{aligned} \tag{12}$$

Define Q_0 to be the term in brackets in (11) that multiplies λ and Q_1 to be the corresponding term in (12). In theory, the signs of Q_0 and Q_1 are ambiguous. Following Borjas (1987), it is reasonable to expect that $\sigma_0/\sigma_1>1$, since available data suggests that earnings dispersion is wider in Mexico than in the United States (and this expectation is consistent with the returns to education being higher in Mexico). We also expect ρ_{01} to be positive, as long as employers in Mexico and the United States value similar attributes. On its own, this would suggest that Q_0 would tend to be positive and Q_1 would tend to be negative, or that, conditional on observed characteristics, migrants from Mexico would tend to have lower returns to unobserved skills in either Mexico or the United States than residents of Mexico who do not to migrate.

From the earlier discussion on migration costs, there is reason to believe $\rho_{0\pi}$ and $\rho_{1\pi}$ may be negative (individuals with higher unobserved skills have lower time-equivalent migration costs), which leaves open the possibility that $Q_0<0$ and $Q_1>0$ and that there is positive selection of migrants. To resolve the issue, we turn to data and use Heckman's (1979) correction for sample selection to estimate the following models:

$$E(\ln(w_0) \mid -\hat{v} > -\hat{z}) = X\delta_0 + \alpha\lambda(-\hat{z}) \quad (13)$$

and

$$E(\ln(w_1) \mid \hat{v} > \hat{z}) = X\delta_1 + \beta\lambda(\hat{z}) \quad (14)$$

where δ_0, δ_1, α, and β are parameters to be estimated. Finding $\alpha>0$ and $\beta<0$ would indicate negative selection of migrants: migrants have below-average returns to unobserved skills in the United States (compared to how Mexican residents would perform) and non-migrants have above-average returns to unobserved skills in Mexico (compared to how migrants in the United States would perform). Finding $\alpha<0$ and $\beta>0$ would indicate positive selection of migrants: migrants have above-average returns to unobserved skills and non-migrants have below-average returns to unobserved skills.

3. Data and Preliminary Evidence

To compare economic outcomes for migrants with individuals that choose to remain at home, we need information on worker characteristics in both migrant sending and receiving countries. We use data from the 1% 1990 population subsample and the 10% 2000 population subsample from *General Census of Population and Housing* for Mexico and data from the 1990 5% PUMS (public use microdata sample) and the 2000 1% PUMS from the *Census of Population and Housing* for the United States.[5]

For the empirical analysis, we are interested in which Mexican individuals choose to become migrants and in how these individuals perform in the United States relative to how they would perform in Mexico. For the sample of Mexican immigrants, we separate out recent migrants (individuals who migrated within the last ten years). Recent migrants reflect the composition of individuals admitted under current U.S. immigration policy. One set of measurement issues relates to the fact that we do not observe all relevant characteristics on individuals in our sample. For Mexican immigrants and residents of Mexico, we observe their sex, age, schooling level, marital status, hours worked, labor earnings, etc. But for Mexican immigrants in the United States, we do not observe their place of birth or prior residence in Mexico. This is unfortunate, since historical migration networks vary by region in Mexico, making region of birth important for determining who moves to the United States (Woodruff and Zenteno, 2002).

A second measurement issue is whether we have random samples of individuals in each country. Beyond standard problems with obtaining an accurate population census, there is the additional issue in the United States that a large fraction of

[5] For Mexico, we take a random 10% sample of the 2000 10% sample. We exclude from the Mexico population census all individuals not born in Mexico.

immigrants from Mexico are in the country illegally. In 2000, out of the 7.9 million Mexican-born individuals in the United States 3.5 million were estimated to be illegal immigrants. Might we be concerned that illegal immigrants are under-represented in the U.S. population census? The U.S. Census Bureau estimates that of the 31.1 million foreign-born individuals enumerated in the 2000 U.S. population census, 7 million were illegal immigrants (Robinson, 2001). It further approximates that the census undercounts illegal immigrants by 15%. This matters for our empirical analysis if the distribution of labor-market characteristics for these individuals differs systematically from that for the immigrants in the sample. While we cannot address this issue directly, we recognize that missing illegal immigrants may complicate our analysis.

3.1 Summary Statistics

We begin the data summary by considering the magnitude of migrant outflows from Mexico to the United States. The size of the Mexican immigrant population in the United States is well documented, but the size of this population relative to the population of Mexico is perhaps less appreciated. Table 1 shows Mexican immigrants in the United States as a percentage of the population of Mexico by age cohort for males and females. The sample is all individuals 16-65 years of age. Among males 25-34 years old, the 1990 stock of Mexican immigrants in the United States was equivalent to 12.0% of that 1990 age cohort in Mexico. For females, this figure is 8.1%. The size of the Mexican immigrant population relative to the population of Mexico is smaller for younger and older cohorts. The within decade outflows of individuals from Mexico are also large. Among males 25-34 years old, the accumulated net outflow of Mexican migrants to the United States during the 1980's was equal to 6.4% of this cohort's 1990 population in Mexico. For females, this figure is 4.3%. Again, the magnitude of migrant outflows relative to the population of Mexico is smaller for younger and older cohorts. Overall, the accumulated outflows of Mexican migrants appear to be sufficiently large to have substantial labor-market consequences in Mexico.

There are several possible explanations for why the relative stock and relative outflow of Mexican migrants is larger for younger cohorts. One relates to the facts that the young are more likely to migrate and that immigration levels have been rising over time. This would make younger cohorts of Mexican immigrants in the United States relatively large, but would also imply that as these cohorts age they will stay large relative to the population of Mexico. A second explanation is that there is life-cycle pattern to Mexican migration to the United States, with individuals leaving Mexico while young and returning to Mexico in their later years.

Tables 2a and 2b show summary statistics on age, educational attainment, labor-force participation, and average hourly wages for residents of Mexico, all Mexican immigrants in the United States, recent Mexican immigrants in the United States, and, for comparison, other U.S. immigrants and U.S. natives. We choose education categories that permit comparisons between the United States and Mexico in all census years. These categories correspond reasonably well to modes for high grade of schooling completed in Mexico, which occur at grade 6 (primary education), grade 9 (secondary education), and grade 12 (preparatory education). Many immigrants arrive in the United States as children and obtain additional schooling in the country. These individuals may not have chosen consciously to become immigrants but instead may have moved to the

United States as a result of decisions made by family members. Their level of schooling may reflect U.S. educational opportunities and so be endogenous to having migrated. To focus on individuals who made their own migration decisions, we exclude from the migrant sample individuals aged 16 years or younger at time of U.S. entry.[6]

Tables 2a and 2b reproduce the familiar facts that when compared to other U.S. residents Mexican immigrants in the United States are younger, are much less educated, and have much lower hourly wages.[7] In 1990, 72.3% of all Mexican immigrant men and 68.2% of recent Mexican immigrant men had completed 11 or fewer years of school, compared to only 19.0% of U.S. native men. However, Mexican immigrants, and recent immigrants in particular, compare favorably when we examine educational attainment in Mexico. In 1990, 81.0% of male residents of Mexico had 11 or fewer years of schooling. Relative to male residents of Mexico, Mexican immigrant men are less likely to have 11 or fewer years of education, more likely to have 12-15 years of education, and less likely to 16 plus years of education. A similar pattern holds for women. Mexican immigrants would thus be concentrated in the upper middle portion of the distribution of educational attainment for Mexican residents.[8] That recent Mexican immigrants tend to have relatively high levels of schooling reflects in part the facts that these individuals are relatively young and that educational attainment in Mexico has been rising over time.

Differences in labor-force participation rates for Mexican-born individuals in Mexico and the United States, which are evident in Table 2b, present a potential problem

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[6] Average schooling for immigrants who were 16 years old or younger at time of arrival in the United States is higher than for immigrants who for arrived at an older age.

[7] Given differences in questions asked in the U.S. and Mexico censuses, the available measure of hourly wages differs somewhat in the two countries. For Mexico, average hourly wages are calculated as monthly labor income/(4.5*hours worked last week); for the United States, average hourly wages are calculated as annual labor income/(weeks worked last year*usual hours worked per week).

[8] We observe similar patterns when we restrict the comparison of educational attainment to individuals who participate in the labor force.

for the empirical analysis. In constructing counterfactual wage densities, we will want to examine a population of Mexican migrants that would be likely to participate in the labor force were they to return to Mexico. To gauge how labor-force participation differs in the two countries, Table 3 reports the fraction of the 1990 population of Mexican residents and of recent Mexican immigrants in the United States with positive labor earnings by cells for age and educational attainment. We use this definition of labor-force participation, as it reflects the sample of individuals for which we have observations on wages. For males 25-55 years of age with more than four years of education, labor-force participation rates in the two countries are quite similar. Labor-force participation rates are higher for Mexican immigrants in the youngest cohort (16-24 years) of males, the oldest cohort (55-65 years) of males, and for males with very low levels of education (0-4 years). To avoid selection issues associated with the labor-force participation decision, we focus much of the analysis on males aged 25 years or older.

For women, labor-force participation differs markedly between Mexican migrants and residents of Mexico. For individuals with 11 or fewer years of education, immigrant women are substantially more likely to have positive labor earnings. This could reflect the possibility that relative to males low-income female labor-supply is more responsive to the wage level. Substantially higher wages in the United States could induce higher rates of labor-force participation. It could also reflect self-selection into migration of women who are more likely to work at any wage level. In either case, the subpopulation of Mexican immigrant women in the United States who work may be a poor indicator of the subpopulation of these women that would work were they to return to Mexico. We are correspondingly circumspect about the results for the samples of women.

3.2 The Returns to Education and Mexico-U.S. Wage Differentials

To motivate the analysis in section 4, we report evidence on differences in labor-market outcomes for residents of Mexico and Mexican immigrants in the United States. We begin by estimating OLS wage regressions for five samples of individuals: residents of Mexico, recent Mexican immigrants in the United States, all Mexican immigrants in the United States, other immigrants in the United States, and U.S. natives. These regressions give an indication of how the estimated returns to education differ across countries and between natives and immigrants.[9]

Tables 4a and 4b report the regression results. The regressors are dummy variables for seven categories of educational attainment, age, age squared, a dummy variable for marital status, a dummy variable for residence in a metropolitan area, dummy variables for race, and, for immigrants, dummy variables for year of entry into the United States.[10] The estimated returns to education for residents of Mexico are substantially higher than for Mexican immigrants or other groups in the United States. Completing 12 years of schooling is associated with an increase in hourly wages of 66.2 log points for men in Mexico but only 12.4-18.2 log points for Mexican-born men in the United States. A similar pattern holds for women. However, the base wage, as shown by the constant

[9] Given the discussion in section 2, one may be concerned that OLS wage regressions for residents of Mexico or Mexican immigrants in the United States are contaminated by sample selection bias. We find that coefficients from wage regressions corrected for sample selection associated with the migration decision are very similar to those reported in Tables 4a and 4b (those for Mexican immigrants are nearly identical to OLS coefficients; those for Mexican residents are slightly larger than OLS coefficients). We report OLS estimates to provide a basis for comparison with previous literature.

[10] We restrict the sample to be individuals 25-65 years old. For immigrants, we exclude individuals aged 16 years or less at time of entry in the United States. For Mexican residents, we exclude individuals with hourly wages less than $0.10 or greater than $20; for U.S. residents, we exclude individuals with hourly wages less than $1 or greater than $100 (monetary units are 1990 dollars). The wage restrictions are meant to purge observations subject to extreme measurement error (and follow Butcher and DiNardo, 2002). In 1990, less than 0.5% of wage earners in Mexico earned more than $20 an hour.

term, is substantially higher in the United States than in Mexico. This difference in the base wage helps account for the large wage differences between the two countries.[11] Table 4a also confirms previous results that estimated returns to education in the United States are lower for more recent immigrants than for other immigrants, that Mexican immigrants have lower estimated returns to education than other immigrants, and that immigrants have lower estimated returns to education than U.S. natives (Borjas, 1996).[12]

Who migrates to the United States from Mexico is determined in part by expected wage differences between the two countries. Using the estimated returns to observed characteristics, we calculate the predicted difference in log wages at each age and education level.[13] While this is only a crude indication of the incentive to migrate, it is useful for generating approximate binational wage differences at a point in time.[14] One issue in constructing these differences is whether to adjust predicted wages for differences in the cost of living between the two countries. If migrants move to the United States permanently, then we would want to make such an adjustment. In fact, many migrants remit a portion of their earnings to family members in Mexico (Woodruff and Zenteno, 2002) or return to Mexico for extended visits (Durand and Massey, 1992; Espenshade, 1995). For these migrants, the relevant price level may be that in Mexico, in which case the nominal difference in U.S.-Mexico wages is the appropriate one to consider. In the interest of producing more conservative estimates of wage differences,

[11] We exercise caution in interpreting the value of the constant term as it captures differences in mean returns to unobserved skills as well as differences in returns to raw labor across populations.
[12] In unreported results, we estimated wage regressions including interactions among age, age squared, and the education dummies. These results are qualitatively similar to those reported here.
[13] The regressions we use to calculate predicted wages in the United States and Mexico use a complete set of interactions between educational attainment, age, and age squared.
[14] In constructing cross-country wage differences, we assume implicitly that the constant term captures the return to raw labor in a country (see note 13).

we adjust Mexican hourly wages to achieve purchasing power parity with the United States, using PPP adjustment factors reported in the Penn World Tables.[15]

Figure 1 reports predicted U.S.-Mexico wage differences by age and education level. Wage differences are largest for the young and for the least educated, but are quite large in absolute value for all groups. For a 30-year old male, the predicted real U.S. wage premium is 103.6 log points for an individual with 9 years of schooling, 83.0 log points for an individual with 12 years of education, and 55.2 log points for an individual with 16 or more years of education. Results for women are similar. Wage differences fall with age in most cases due to the fact that in Mexico the returns to age tend to be constant across age levels while in the United States they rise with age.

That U.S.-Mexico real wage differences appear to be large and positive for all age and education levels suggests that migration costs, broadly defined, are what determine who migrates to the United States. If migration costs were a constant fraction of an individual's wage (i.e., constant in time-equivalent units), then we would expect migration rates to be highest for the least educated. But Table 2 shows that this is not the case. Migration rates are highest for Mexican-born individuals with relatively high levels of education (12-15 years of schooling). To reconcile U.S.-Mexico wage differences that fall with the level of education with migration rates that rise with the level of education (at least up to 16 years of schooling), we need migration costs to be a lower fraction of hourly wages for more-educated individuals. This would be the case, for instance, if the more educated required fewer effective labor hours to migrate abroad.

In this section, we have seen evidence that Mexican immigrants in the United States have high education levels relative to residents of Mexico, that the returns to

[15] In 1990, Mexico's PPP adjusted price level was 43.3% of the price level for the United States.

education for Mexican-born individuals is higher in Mexico than in the United States, and that projected U.S.-Mexico wage differentials for a Mexican-born individual are large for all age-education cohorts and decline with age or schooling.

4. Migration Abroad and the Distribution of Wages in Mexico

In this section, we examine how migration abroad might impact the distribution of wages in Mexico. This is a complicated question. A comprehensive answer would require determining the wages that Mexican migrants would earn were they to return to Mexico and how the return of these migrants would alter the returns to skill in Mexico. We focus on the first task since the second involves an analysis of the general-equilibrium consequences of migration that is beyond the scope of this paper. We try to ascertain what the distribution of wages for Mexican migrants would be were they paid according to existing patterns of wage determination in Mexico. We begin with a simple comparison of wages for Mexican residents and wages for Mexican immigrants in the United States, where we predict wages for both groups using the OLS wage equation that applies to Mexican residents. We then extend the analysis by constructing counterfactual wage densities for Mexican immigrants in the United States, in which we estimate nonparametrically the distribution of wages that would obtain for this group were they paid in a manner similar to Mexican residents.

4.1 Preliminary Evidence

To gauge the impact of international migration on Mexico's wage distribution, we first examine what the distribution of wages for Mexican immigrants would look like were these individuals paid according to the wage equation that applies to residents of Mexico. This exercise involves the following steps: 1) we estimate OLS wage regressions for male and female residents of Mexico, 2) we use the estimated regression coefficients to calculate predicted wages for wage earners in Mexico and we find the quintiles for this sample, 3) we use the estimated regression coefficients for residents of Mexico to predict wages for Mexican immigrants in the United States, and 4) we use the predicted wages for Mexican immigrants to calculate the fraction of Mexican immigrants that would occupy each of the wage quintiles for Mexican residents. If Mexican residents and Mexican immigrants in the United States had on average the same observed characteristics, then we would expect to find roughly 20% of Mexican immigrants in each of the Mexican-resident wage quintiles.

This exercise is a simple attempt to ascertain which segments of Mexico's wage distribution might be most affected by migration to the United States. It ignores how the distribution of unobserved characteristics might influence the distribution of wages. If, holding age and education constant, Mexican immigrants in the United States have low (high) levels of unobserved ability relative to residents of Mexico, then using regression coefficients for Mexican residents to predict wages for Mexican immigrants would tend to produce wage estimates that were too large (small).

Tables 5a and 5b show how Mexican immigrants in the United States are distributed across wage quintiles for residents of Mexico when we predict their wages using OLS wage equations for Mexican residents. We present results for all Mexican immigrants and for recent immigrants only. Among men, Mexican immigrants are relatively concentrated in the third and fourth quintiles of Mexican residents and recent immigrants are relatively concentrated in the fourth quintile. Mexican immigrant men would thus appear to fall disproportionately in the upper half of the wage distribution for Mexican residents. This is not surprising, given the relatively high fraction of Mexican immigrant men that have completed 12-15 years of schooling.

Among women, immigrants are concentrated in the lower wage quintiles. These results, however, should be interpreted with caution. While labor-force participation rates for Mexican resident men and Mexican immigrant men are quite similar, they differ sharply lower for Mexican resident women relative Mexican immigrant women. These differences are largest among women with low education levels. This results in female Mexican wage earners in the United States being much younger and somewhat less educated on average relative to female residents of Mexico, even though in the total population immigrant women have relatively high education levels.

The simple analysis in Table 5 suggest that migration abroad may tend to relieve pressure on the upper middle portion of Mexico's wage distribution. Were this the case in actuality, international migration would tend to raise wage dispersion in Mexico. We turn next to a nonparametric analysis of this issue.

4.2 Counterfactual Wage Densities

Wage distributions for Mexican immigrants in the United States and for residents of Mexico may differ due to differences in the distribution of skills in the two groups or due to differences in the prices of skills in the two countries. We wish to compare wage distributions for Mexican migrants and for Mexican residents under a common set of skill prices. The last section gave a preliminary analysis of this issue. An alternative approach is to compute the counterfactual wage density of Mexican migrants in the United States, assuming they are paid according to Mexico's wage structure, and compare it to the actual distribution of wages in Mexico. This approach, which involves adapting the methodology in DiNardo, Fortin, and Lemieux (1996),[16] allows a more detailed analysis of where Mexican immigrants in the United States would fall within Mexico's wage distribution if they were to return to Mexico.

We begin with the actual wage density of individuals working in Mexico, which corresponds to Mexico's wage structure integrated over the distribution of characteristics for individuals in the country. Then, we modify this distribution by replacing the distribution of individual characteristics so that it corresponds to that of immigrants, while we hold Mexico's wage structure constant. This simulates the wage distribution that would prevail given migrant characteristics and Mexico's current skill prices.

Let $f^{i}(w|x)$ be the density of wages *w* in country *i*, conditional on a set of observed characteristics x. Also, let $h(x|\ i = Mex)$ be the density of these observed characteristics among wage earners in Mexico, and let $h(x|\ i = US)$ be the density of observed characteristics among wage-earning Mexican immigrants in the United States. The observed density of wages for individuals working in Mexico can be written as

$$g(w \mid i = Mex) = \int f^{Mex}(w \mid x) h(x \mid i = Mex) dx \qquad (15)$$

Likewise, the observed density of wages for Mexicans working in the U.S. is

$$g(w \mid i = US) = \int f^{US}(w \mid x) h(x \mid i = US) dx \qquad (16)$$

[16] A similar adaptation of this methodology to the one we make in this paper can be found in Butcher and DiNardo (forthcoming).

Differences in $f^{Mex}(w \mid x)$ and $f^{US}(w \mid x)$ capture differences in the wage structure in each country.[17] Differences in h(x | i = Mex) and h(x | i = US) capture differences in the distributions of observed characteristics between Mexican migrants and non-migrants.

We are interested in computing the density of wages that would prevail for Mexican immigrants in the United States, given their observable characteristics if they were paid according to the prices of skills in Mexico. Formally, we want to estimate:

$$g_{US}^{Mex}(w) = \int f^{Mex}(w \mid x) h(x \mid i = US) dx \tag{17}$$

Note that the desired distribution corresponds to the distribution of wages for individuals in Mexico (1), except that it is integrated over the distribution of skills of migrants instead of that of individuals remaining in Mexico. It is possible to write

$$g_{US}^{Mex}(w) = \int f^{Mex}(w \mid x) h(x \mid i = US) \frac{h(x \mid i = Mex)}{h(x \mid i = Mex)} dx = \int \theta f^{Mex}(w \mid x) h(x \mid i = Mex) dx \tag{18}$$

where

$$\theta = \frac{h(x \mid i = US)}{h(x \mid i = Mex)} \tag{19}$$

Thus, the desired counterfactual density can be estimated by computing the observed wage density for wage earners in Mexico and re-weighting the observations to reflect the distribution of observed characteristics for Mexican migrants (instead for Mexican residents). To compute the weights, note that by Bayes' Law we have:

$$h(x) = \frac{h(x \mid i = US) \Pr(i = US)}{\Pr(i = US \mid x)} \tag{20}$$

and

[17] When the conditional expectation is linear in the observed characteristics, these terms are closely related to the regression equation for wages on observable characteristics in each country.

$$h(x) = \frac{h(x \mid i = Mex)\,\Pr(i = Mex)}{\Pr(i = Mex \mid x)} \tag{21}$$

Equations (5), (6), and (7) imply

$$\theta = \frac{h(x \mid i = US)}{h(x \mid i = Mex)} = \frac{\Pr(i = US \mid x)\,\Pr(i = Mex)}{\Pr(i = Mex \mid x)\,\Pr(i = US)} \tag{22}$$

θ can be computed by: 1) calculating the unconditional probabilities Pr(i =Mex) and Pr(i=US), which are the sample proportions of wage-earning Mexicans residing in Mexico and in the United States, and 2) estimating Pr(i=US | x) parametrically, in which the choice of migrating to the United States is explained by observed characteristics. Once we estimate this model, we can also compute Pr(i=Mex | x) = 1 - Pr(i=US | x) and construct the relevant weight for each observation *j* in the sample θ_j.

Having computed these weights (and normalized them to sum one), we estimate the counterfactual wage density non-parametrically. A kernel density estimator applied to the sample of wage earners in Mexico, but using the weights described above, would yield an estimate of the desired counterfactual density. Thus, the counterfactual density estimate can be computed by adapting the Rosenblatt-Parzen kernel density estimator to the case in which sample weights are attached to each observation, as in

$$\hat{f}(w) = \sum_{j=1}^{n} \frac{\theta_j}{h} K\left(\frac{w - W_j}{h}\right) \tag{23}$$

where we use j = 1,…,n sampled workers in Mexico with wages W_j. In this expression K corresponds to a kernel function, and h is the selected bandwidth. To assess the presence of differences in the distribution of observed skills between Mexican migrants in the United States and Mexican residents, this estimate can be compared to the kernel density estimate of the actual distribution of wages of individuals remaining in Mexico, which would correspond to the density of wages given Mexico's wage structure, integrated over non-migrants' distribution of observed characteristics.

This methodology will only be able to detect differences in the wage distributions of migrants and of non-migrants that are attributable to differences in the distribution of skills that are correlated with observed characteristics. If migrants and non-migrants have identical distributions of observable characteristics, then the counterfactual wage density for migrants would collapse to the kernel density of non-migrants, even if there are differences in the distributions of unobserved skills between these two groups. In the presence of differences in the distribution of unmeasured skills, the results may underestimate the actual difference in the corresponding wage densities.

4.3 Results

We apply the methodology described above to our combined sample of Mexican residents and recent Mexican immigrants in the United States. The sample includes individuals born in Mexico who are 25 to 65 years of age with positive labor earnings. To construct counterfactual wage densities, we estimate a Probit model for Pr(i=US | x). The estimated model links the choice of migrating to the United States to the age and age squared of the individual and dummy variables for educational attainment and marital status. The model also includes interaction terms of the education variables with age, age squared and marital status, as well as interactions between marital status and age. In the case of females, the model also includes the number of children born to an individual and the interactions of this variable with the other regressors.

Having estimated Probit models for males and females and computed the weights in (22), we constructed kernel density estimates for the average hourly wages of individuals residing in Mexico and the counterfactual kernel densities for Mexican immigrants in the U.S., assuming they were paid according to the wage structure in Mexico. In all these estimates, the choice of bandwidth was determined by starting with small bandwidths and increasing them gradually until a relatively smooth plot of the estimate was achieved. When comparing densities, the same bandwidth was applied to each. All estimates are based on a Gaussian kernel function.

The results of this procedure for Mexican males are depicted in Figure 2a. Although the counterfactual density of immigrants in the U.S. is fairly close to the actual density of non-migrant Mexicans, some clear differences are apparent. In particular, for low wages, up to a point close to the peak of the wage distribution in Mexico, the counterfactual density is virtually identical to the actual density of wages in Mexico. Contrary to what the negative-selection hypothesis would imply, it is *not* the least skilled males who exhibit a disproportionately high tendency to migrate to the U.S.

The counterfactual density displays a larger mass for a range of wage values at the peak of the distribution and above. It is not until relatively high wages are reached that the counterfactual density falls below the actual density of non-migrant males. The negative-selection hypothesis only appears to explain the comparative behavior of medium and highly skilled individuals, in the sense that the latter seem to be more induced to stay in Mexico, as compared to the former, presumably in order to benefit from higher returns to education in Mexico.

Consistent with earlier results, it appears that the individuals with the highest tendency to migrate abroad have medium-to-high schooling and that those least likely to migrate have very high schooling. Were Mexican migrant males in the United States to return to Mexico and be paid according to Mexico's current wage structure, they would tend to fall disproportionately in the middle and upper half of Mexico's wage distribution. This suggests that migration abroad, by taking mass away from the middle of Mexico's wage distribution, may raise wage inequality in the country.[18]

The general pattern that emerges from these estimates is consistent with the wage quintiles in Table 5 and with the observed patterns of educational attainment in Table 2.[19] In particular, the results suggest that the likelihood that a Mexican male migrates to the United States increases only after a minimal threshold level of observable skills is attained. This could be a consequence of a negative correlation between time-equivalent migration costs and observed skill levels.

As opposed to the case of males, the results for females appear to be more supportive of negative selection. In Figure 2b, we see that up to the peak of the wage distribution for females in Mexico, the counterfactual density for migrant females is consistently above the actual density of female wages in Mexico. To the right of the peak, the counterfactual density is below the actual density. This suggests that were migrant

[18] This does not necessarily imply that migration abroad has an adverse effect on income inequality at the household level. To make a complete assessment, a detailed analysis of the distributive effects of remittances of U.S. immigrants to their relatives in Mexico would be needed.

[19] It is important to recall that recent Mexican immigrant males in the United States tend to be significantly younger than their counterparts in Mexico. Their lower age offsets part of the effect that higher educational levels have on their counterfactual wage distribution. That is, if we controlled for this age difference and considered only educational attainment as a measure of skill, recent immigrant males would appear to be even more skilled, as compared to individuals in Mexico. We can conclude that, in terms of educational attainment only, migrant males tend to fall in the upper half of Mexico's skill distribution even more disproportionately than what appears to be the case in Figure 2a.

females to return to Mexico they would fall disproportionately in the lower part of Mexico’s wage distribution. This is also consistent with the results in Table 5.

This interpretation, however, must be taken with care, given the large differences in labor-force participation rates of Mexican females in Mexico and Mexican females in the United States. The results would be supportive of negative selection if we could be fairly certain that, were female migrants to return to Mexico, they would still be in the labor force. We cannot be assured of this, however, due to large wage differentials between the two countries. Based on Table 3, many of the females in the U.S. labor force that appear to have been negatively selected from Mexico would possibly be out of the labor force if they had remained in Mexico. Thus, the results in Figure 2b are also consistent with the existence of low-skilled females who would not participate in the labor force in Mexico, but, once they migrate to the U.S. (perhaps as the result of a household decision) enter the U.S. labor force in response to higher wage levels. If we assumed artificially these less skilled females would be in the labor force had they stayed in Mexico, the actual wage density in Mexico would exhibit more mass in its lower half. The apparently larger mass of the counterfactual density in this region may be a result of the participation effect, and not necessarily of negative selection.

5. Selection of Migrants in Unobservable Characteristics

To be written.

6. Discussion

To be wriiten.

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Table 1: Share of U.S. Immigrants from Mexico in Population of Mexico, 1990
(percent)

	All Mexican Immigrants		Arrivals 1981-1990		Arrivals 1986-1990	
Age	Males	Females	Males	Females	Males	Females
16-24	7.53	4.88	5.79	3.32	3.92	2.26
25-34	12.02	8.18	6.46	4.27	2.92	2.10
35-44	10.17	8.16	2.55	2.02	1.21	0.90
45-54	7.57	6.99	1.56	1.40	0.79	0.70
55-65	5.96	6.11	0.83	1.06	0.44	0.56

Notes: This table shows Mexican immigrants in the United States (either all immigrants or immigrants that arrived during the period 1981-1990) as a percentage of the 1990 population of Mexico by age and sex categories.

Table 2a: Summary Statistics for Males, 1990

Variable		Mexico Residents	U.S. Residents: Recent Mex. Immigrants	All Mex. Immigrants	Other Immigrants	U.S. Natives
Age		32.7	29.3	35.0	40.5	37.2
Highest Grade	0	11.6	11.9	12.8	3.8	0.6
of Schooling	1 to 4	19.1	10.7	14.6	2.7	0.5
Completed	5 to 8	28.6	29.0	30.9	9.2	3.9
(%)	9	13.9	9.4	7.9	2.9	3.3
	10 to 11	7.7	7.2	6.1	4.7	10.7
	<12	81.1	68.2	72.3	23.2	19.0
	12	6.5	19.9	17.0	24.1	32.4
	13 to 15	4.7	8.5	7.8	21.5	27.7
	16+	7.7	3.5	2.9	31.2	20.9
Wage Earners (%)		66.1	83.0	83.7	78.6	80.9
Hourly wage		1.45	6.95	8.12	13.92	14.18
		(2.5)	(5.73)	(6.6)	(12.0)	(12.3)
N		211,133	36,119	66,660	189,237	708,727

Notes: The sample is all individuals 16-65 years old. Residents of Mexico are a 10% random sample of the 10% population sample of the *XII Censo General de Poblacion y Vivienda, 1990*; Mexican and other immigrants are drawn from the 1990 5% U.S. PUMS; and U.S. natives are drawn from the 1990 1% U.S. PUMS. Immigrants in the United States are restricted to be individuals 17 years or older at time of entry into the country. Recent immigrants from Mexico are individuals who entered the United States during the period 1981-1990. Schooling variables show the percentage of individuals whose high grade completed is that indicated and wage earners shows the percentage of individuals with positive labor earnings in 1990. Wage levels are in 1990 U.S. dollars. Average wages in Mexico are for those individuals with average hourly earnings greater than $0.1 and less than $50 and in the United States are for those individuals with average hourly earnings greater that $1 and less than $100. The reported sample size is all individuals (not just those with valid wages).

Table 2b: Summary Statistics for Females, 1990

			U.S. Residents			
		Mexico Residents	Recent Mex. Immigrants	All Mex. Immigrants	Other Immigrants	U.S. Natives
Age		32.7	31.0	37.1	41.9	37.7
Highest Grade	0	15.6	12.3	12.8	4.4	0.5
of Schooling	1 to 4	19.6	12.0	14.6	3.3	0.3
Completed	5 to 8	28.1	30.0	32.6	10.2	3.1
(%)	9	12.3	8.5	7.3	3.1	2.9
	10 to 11	7.4	6.1	5.3	4.9	10.5
	<12	83.3	68.9	72.6	25.8	17.2
	12	7.6	19.5	17.3	30.3	35.6
	13 to 15	4.5	8.2	7.5	22.2	29.6
	16+	4.6	3.4	2.6	21.7	17.5
Wage Earners (%)		20.7	44.7	48.2	60.5	70.3
Hourly wage		1.33	6.05	6.62	10.15	9.47
		(2.1)	(5.38)	(5.8)	(8.4)	(7.4)
N		228,964	26,643	51,918	213,020	737,267

Notes: See notes to Table 2a.

Table 3a: Labor-Force Participation Rates, Males in 1990

	Residents of Mexico					Recent U.S. Immigrants from Mexico				
Years of	Age Category					Age Category				
Schooling	16-24	25-34	35-44	45-54	55-65	16-24	25-34	35-44	45-54	55-65
0	52.2	62.5	64.5	61.4	50.5	73.6	81.9	82.7	81.4	67.7
1 to 4	57.9	83.1	84.6	78.8	60.0	78.1	87.3	84.6	81.0	64.4
5 to 8	50.5	84.1	88.1	82.7	61.5	79.0	87.5	85.5	81.0	70.3
9	59.6	71.2	72.4	66.8	54.8	77.7	85.9	85.5	82.0	71.1
10 to 11	50.3	83.5	90.7	86.0	67.8	77.9	86.0	84.1	83.7	76.1
12	58.3	78.0	80.8	76.6	58.7	80.0	87.1	84.7	82.7	65.9
13 to 15	29.7	85.6	87.7	78.3	62.2	74.7	86.4	84.8	74.9	71.7
16+	31.6	81.6	89.6	83.7	63.6	81.9	88.9	85.7	78.6	69.6

Notes: This table shows the percentage of the population that reported positive labor earnings in 1990 by age category and by highest year of schooling completed for residents of Mexico and for recent Mexican immigrants in the United States (individuals who arrived in the country during the period 1986-1990). Immigrants are individuals aged 17 years or older at time of entry in the United States.

Table 3b: Labor-Force Participation Rates, Females in 1990

	Residents of Mexico					Recent U.S. Immigrants from Mexico				
Years of	Age Category					Age Category				
Schooling	16-24	25-34	35-44	45-54	55-65	16-24	25-34	35-44	45-54	55-65
0	9.3	8.7	9.2	8.6	6.8	32.1	40.8	44.6	36.7	14.4
1 to 4	27.0	27.1	29.6	26.5	11.8	35.9	48.0	52.5	51.9	27.0
5 to 8	36.7	46.7	47.4	41.4	21.6	44.4	50.4	54.9	46.2	26.1
9	13.0	10.1	11.1	9.5	6.9	30.9	44.6	51.2	43.9	21.7
10 to 11	46.9	58.1	60.7	54.2	31.8	42.1	51.5	61.2	49.1	34.4
12	18.3	15.9	18.9	16.5	10.1	37.1	47.3	49.4	46.1	25.8
13 to 15	17.5	35.0	39.2	34.8	16.5	36.9	47.1	45.4	58.7	38.3
16+	27.0	54.6	57.3	50.7	27.3	48.9	53.8	54.7	57.0	37.0

Notes: See notes to Table 3a.

Table 4a: OLS Wage Regressions for Men, 1990

Variable		Mexican Residents	Mexican Immigrants Recent	Mexican Immigrants All	Other Immigrants	U.S. Natives
Constant		-1.748	1.228	1.033	0.959	0.198
		(0.039)	(0.080)	(0.057)	(0.034)	(0.021)
High	1 to 4	0.123				
Grade		(0.009)				
Completed	5 to 8	0.267	0.041	0.068	0.028	0.051
		(0.009)	(0.012)	(0.008)	(0.010)	(0.016)
	9	0.420	0.101	0.142	0.043	0.143
		(0.011)	(0.018)	(0.012)	(0.014)	(0.017)
	10 to 11	0.547	0.052	0.124	0.106	0.184
		(0.014)	(0.020)	(0.014)	(0.012)	(0.016)
	12	0.662	0.124	0.182	0.183	0.328
		(0.013)	(0.014)	(0.010)	(0.009)	(0.015)
	13 to 15	0.857	0.198	0.266	0.307	0.438
		(0.014)	(0.018)	(0.012)	(0.009)	(0.015)
	16+	1.133	0.391	0.471	0.637	0.716
		(0.011)	(0.026)	(0.022)	(0.009)	(0.016)
Age		0.044	0.015	0.021	0.044	0.068
		(0.002)	(0.004)	(0.003)	(0.002)	(0.001)
$Age^2/100$		-0.045	-0.017	-0.027	-0.048	-0.066
		(0.002)	(0.005)	(0.003)	(0.002)	(0.001)
Imm.	1981-84		0.122	0.123	0.094	
Cohort			(0.009)	(0.009)	(0.005)	
	1975-80			0.256	0.212	
				(0.009)	(0.006)	
	1971-74			0.349	0.321	
				(0.011)	(0.007)	
	1965-70			0.430	0.395	
				(0.015)	(0.008)	
	pre 1965			0.503	0.473	
				(0.017)	(0.008)	
R Sqd.		0.235	0.045	0.112	0.244	0.213
N		98,139	19,940	42,514	134,403	450,756

Table 4b: OLS Wage Regressions for Women, 1990

Variable		Mexican Residents	Mexican Immigrants Recent	Mexican Immigrants All	Other Immigrants	U.S. Natives
Constant		-1.684	1.350	1.213	1.328	0.835
		(0.069)	(0.130)	(0.083)	(0.036)	(0.025)
High	1 to 4	0.092				
Grade		(0.019)				
	5 to 8	0.217	0.002	0.030	0.011	-0.019
		(0.017)	(0.017)	(0.011)	(0.010)	(0.021)
	9	0.459	0.046	0.080	0.026	0.002
		(0.020)	(0.026)	(0.017)	(0.013)	(0.022)
	10 to 11	0.615	0.039	0.084	0.057	0.041~
		(0.023)	(0.030)	(0.022)	(0.012)	(0.020)
	12	0.758	0.111	0.154	0.146	0.214
		(0.019)	(0.020)	(0.013)	(0.008)	(0.020)
	13 to 15	0.906	0.176	0.253	0.338	0.396
		(0.020)	(0.027)	(0.017)	(0.009)	(0.020)
	16+	1.078	0.355	0.446	0.625	0.736
		(0.019)	(0.039)	(0.031)	(0.009)	(0.020)
Age		0.043	0.002	0.008	0.013	0.034
		(0.003)	(0.007)	(0.004)	(0.002)	(0.001)
$Age^2/100$		-0.044	0.000	-0.009	-0.016	-0.033
		(0.004)	(0.009)	(0.005)	(0.002)	(0.001)
Imm.	1981-84		0.060	0.064	0.113	
Cohort			(0.013)	(0.013)	(0.006)	
	1975-80			0.146	0.221	
				(0.014)	(0.007)	
	1971-74			0.216	0.282	
				(0.016)	(0.007)	
	1965-70			0.245	0.319	
				(0.020)	(0.008)	
	pre 1965			0.272	0.335	
				(0.023)	(0.008)	
R Sqd.		0.230	0.032	0.061	0.182	0.176
N		29,193	8,689	20,560	117,187	404,792

Notes to Table 4:

Reported coefficients are for OLS regressions using the log average hourly wage as the dependent variable. Heteroskedasticity-consistent standard errors are in parentheses. The samples are individuals 25-65 years of age who are residents of Mexico (column 1), Mexican immigrants in the United States who arrived during the period 1981-1990 (column 2), all Mexican immigrants in the United States (column 3), other (non-Mexico-born) immigrants in the United States (column 4), or native-born U.S. residents (column 5). Immigrant samples exclude individuals aged 16 years or less at time of entry in the United States. The Mexican-resident sample excludes individuals with hourly wages less than $0.10 or greater than $20 and U.S.-resident samples exclude individuals with hourly wages less than $1 or greater than $100 (monetary units are 1990 dollars). Additional regressors (not shown) are dummy variables for marital status and residence in a metropolitan area (all columns), dummy variables for race (columns 4 and 5), and dummy variables for year of entry in the United States (columns 2-4).

Table 5:
Predicted Wages for Mexican Immigrants and Wage Quintiles in Mexico

	% of Mex. Immigrants with Predicted Wages in Quintile			
	Men		Women	
Wage Quintle for Residents of Mexico	All Immigrants	Recent Immigrants	All Immigrants	Recent Immigrants
1	18.6	19.1	19.3	23.1
2	17.2	17.8	29.6	28.5
3	21.8	20.2	20.3	19.0
4	23.2	26.4	17.5	19.2
5	19.2	16.5	13.3	10.2

This table shows how Mexican immigrants in the United States would be distributed across wage quintiles for residents of Mexico. Quintiles are constructed using an OLS wage equation estimated on residents of Mexico to predict within sample wages. The same OLS wage equation is then used to predict wages for Mexican immigrants in the United States. See the text for details on the estimation.

Figure 1: Predicted U.S.-Mexico Log Wage Differentials, 1990

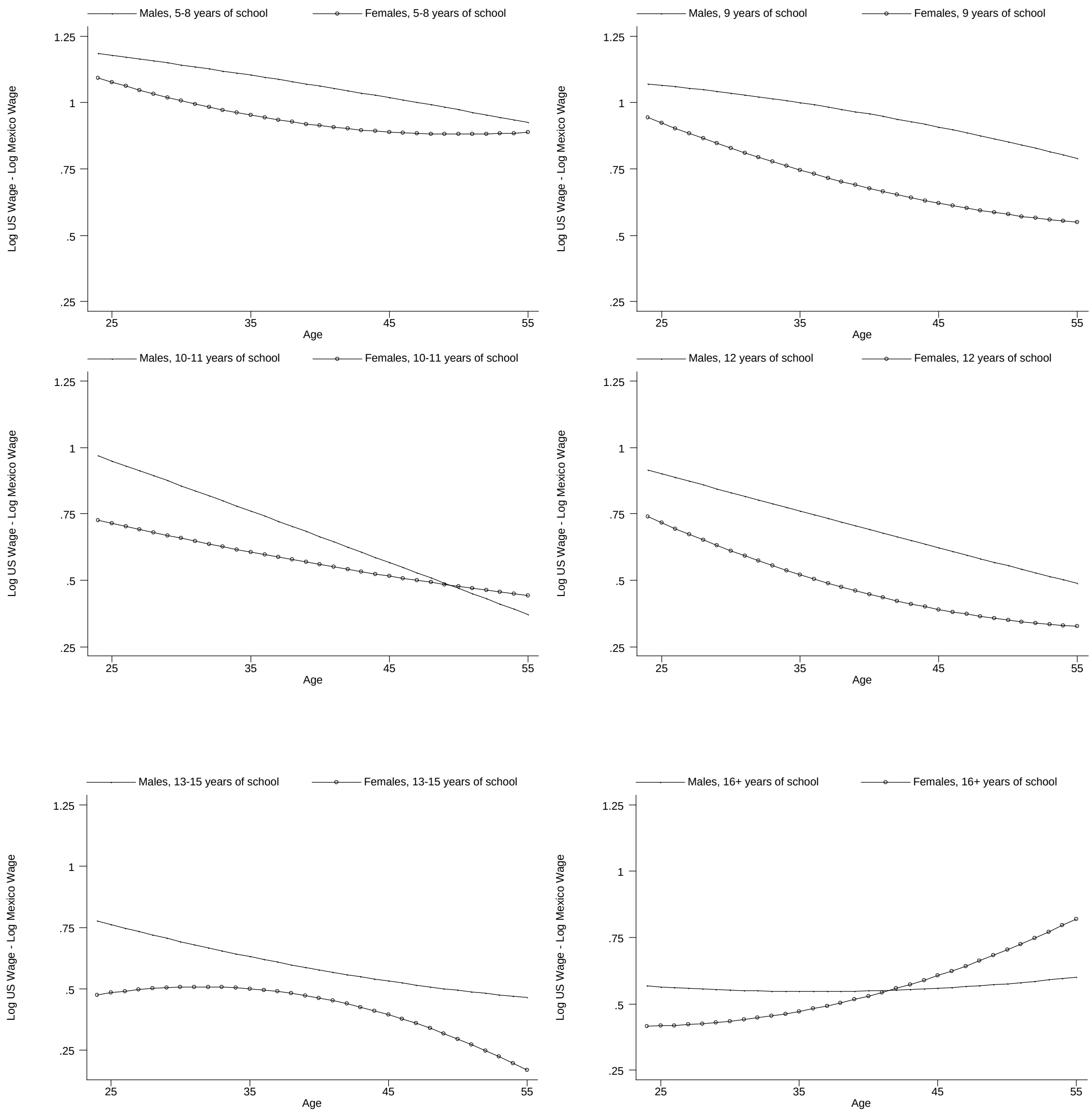

Figure 2a: Counterfactual Wage Densities for Mexican Migrant Males, 1990

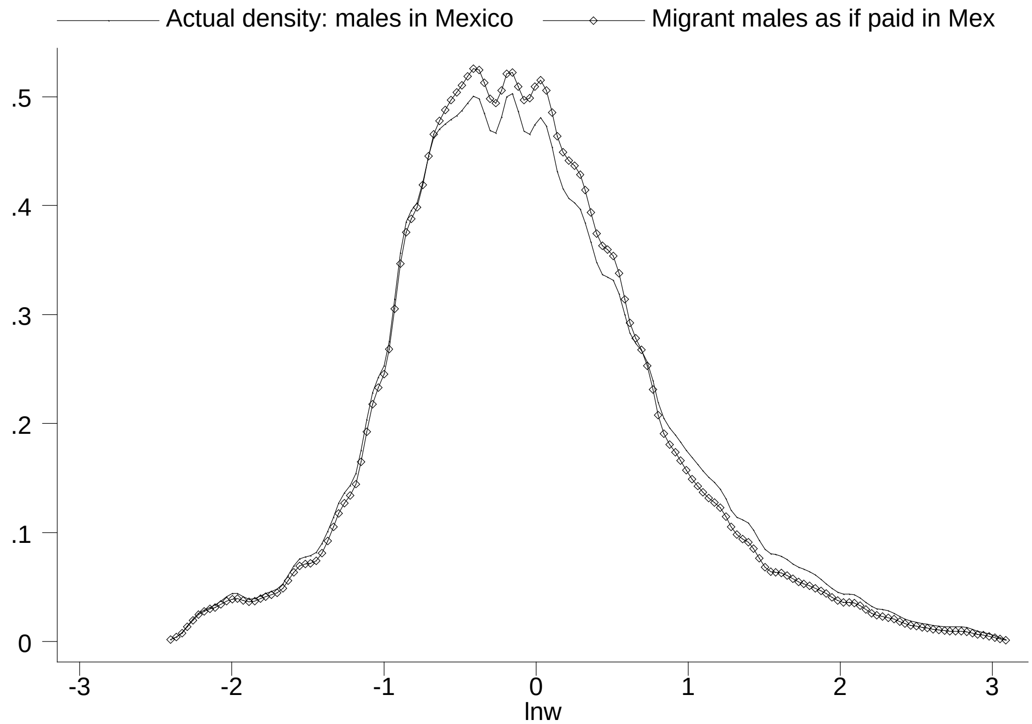

Figure 2b: Counterfactual Wage Densities for Mexican Migrant Females, 1990

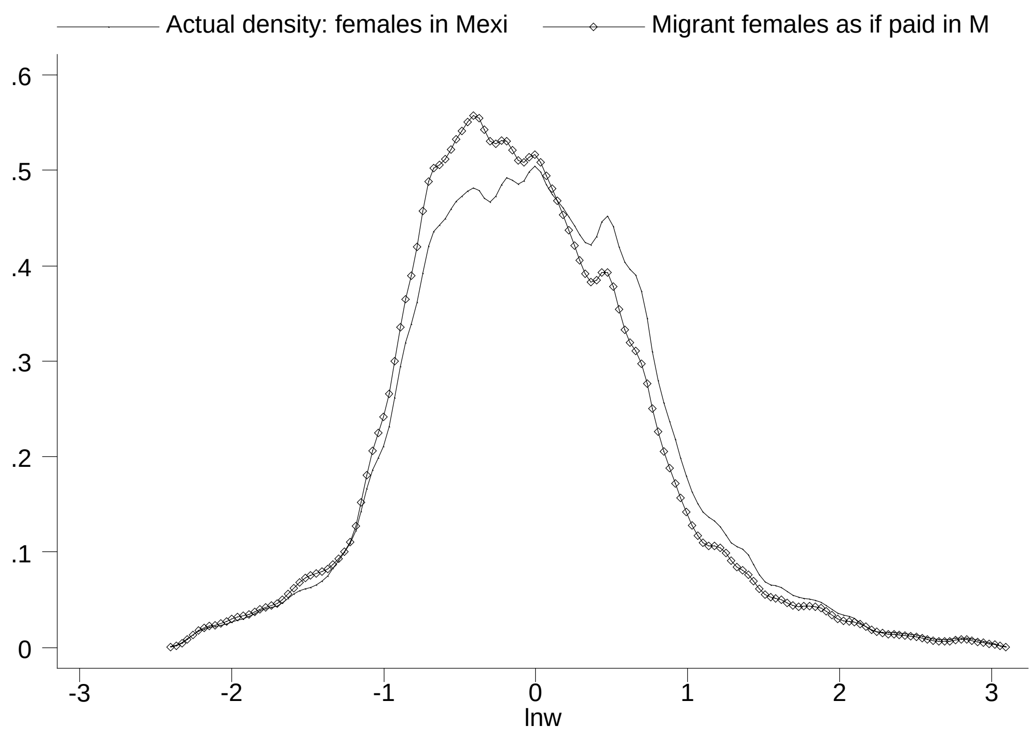

Figure 3a

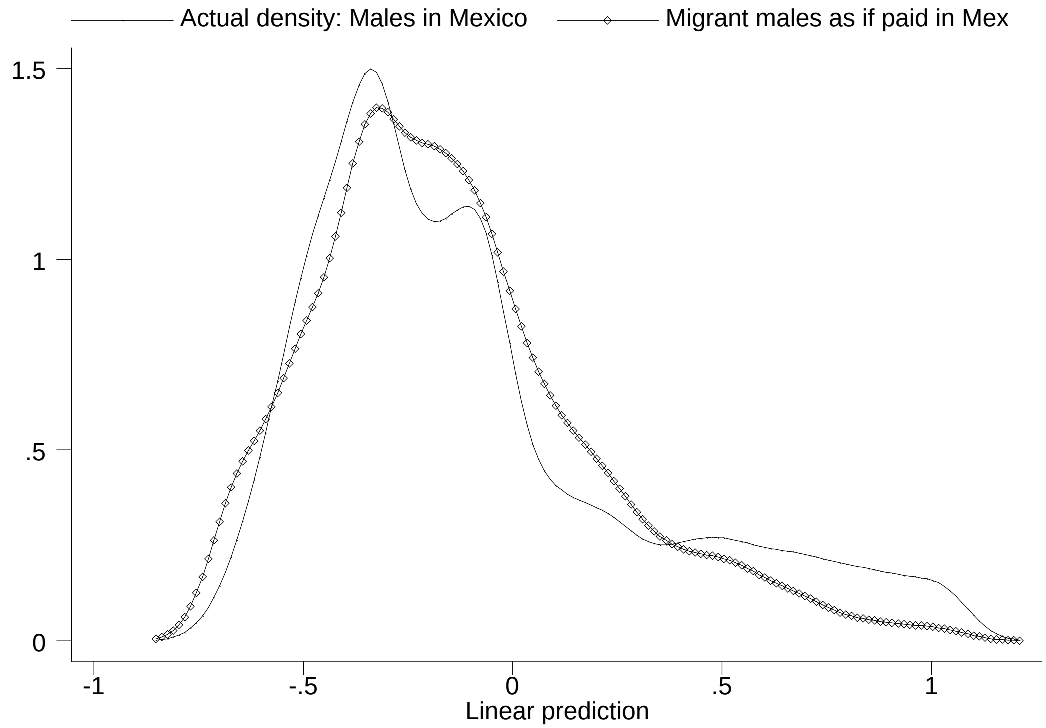

Figure 3b