Wealth constraints, skill prices or networks: what determines emigrant selection?

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Abstract

The productive characteristics of migrating individuals, emigrant selection, affect welfare. The empirical estimation of the degree of selection suffers from a lack of complete and nationally representative data. This paper uses a new and better dataset to address both issues: the ENET (Mexican Labor Survey), which identifies emigrants right before they leave and allows a direct comparison to non-migrants. This dataset presents a relevant dichotomy: it shows on average negative selection for Mexican emigrants to the United States for the period 2000-2004 together with positive selection in Mexican emigration out of rural Mexico to the United States in the same period. Three theories that could explain this dichotomy are tested. Whereas higher skill prices in Mexico than in the US are enough to explain negative selection in urban Mexico, its combination with network effects and wealth constraints is required to account for positive selection in rural Mexico.

JEL Classification: F22, O15, J61, D33
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1 Introduction

The goal of this paper is to explain why the pattern of emigrant selection varies in rural and urban Mexico. Fernández-Huertas Moraga (2007) shows that emigrants from Mexico to the United States earn an average wage before migrating lower than the average wage of those who decide to stay home. This is what Borjas (1999) defines as negative selection. However, Fernández-Huertas Moraga (2007) also shows that positive selection exists in rural Mexico, where rural Mexico is formed by those who live in localities with 2,500 inhabitants or less.[1]

The literature offers three main arguments that could explain these facts. This paper examines the relative merits of these three competing arguments. It must be noted though that they are neither exclusive nor exhaustive. Previous papers (see below) had already shown the qualitative validity of the three arguments in different frameworks and with distinct datasets. The contribution of this paper is to assess both their qualitative and their quantitative relevance in a common framework and with the same dataset.

The first of the three arguments is the Borjas (1987) argument, which disregards the role of migration costs. If the return to skill were to be lower in rural Mexico than in the United States whereas it were to be higher in urban Mexico, then we should expect positive selection out of rural Mexico and negative selection out of urban Mexico.

The second explanation is the McKenzie and Rapoport (2007b) argument. They propose that the existence of different selection patterns in different migrant datasets can be reconciled by the existence of migration networks. Migration networks reduce migration costs so that emigrants out of areas with larger migration networks tend to be more negatively selected than emigrants out of areas with smaller migration networks. Thus, this could explain the different selection patterns in rural and urban Mexico if migration networks were more present in urban than in rural areas.

Finally, a third argument, developed also by McKenzie and Rapoport (2007a) among others in a different setup, is related to the existence of wealth constraints affecting the migration decision. Even in the presence of higher returns to migration for low skill individ-

[1]Whether positive or negative selection prevails in Mexico is not a settled question. Chiquiar and Hanson (2005), Lacuesta (2006) and Mishra (2007) argue for intermediate to positive selection in Mexico as a whole whereas Ibarrarán and Lubotsky (2007) report negative selection. Cuecuecha (2005) and Caponi (2006) obtain mixed results. McKenzie and Rapoport (2007a) and Orrenius and Zavodny (2005) find positive selection in rural Mexico. See Hanson (2006) and Fernández-Huertas Moraga (2007) for a complete review of these results.

uals relative to high skill individuals in rural Mexico which would lead to negative selection, according to Borjas (1987) argument, it could happen that these low skill individuals cannot cover migration costs by borrowing, thus resulting in positive selection of migrants.

Out of these three arguments, the first one is independent from the structure of migration costs since Borjas (1987) considers them constant across skill groups. On the contrary, the networks and wealth constraints arguments are fundamentally based in the structure of migration costs. Most migration costs are difficult to observe (psychological costs of moving, status costs of becoming an undocumented alien, family burden left behind...) and this makes it difficult to understand how they can be related to observable characteristics of migrants and thus how they affect migration selectivity. If migration costs are increasing (decreasing) in productive skills, they will tend to accentuate (attenuate) negative selection. With this, any migration policy that increases migration costs, such as tougher enforcement, will lead to less (more or less[2]) negative selection. As a result, the true relationship between migration costs and skill levels is not only relevant to study why migrant selectivity evolves in one way or another but also to understand the consequences of different migration policies.

One reason why migration costs can be decreasing in skills is through the positive relationship between these skills and wealth (McKenzie and Rapoport (2007a)), which can then be combined with the existence of wealth constraints in migration. This can be shown by regressing, using semi-parametric analysis to account for non-linearities, the decision to migrate on a household wealth index extracted from the ENET. The results indicate that the probability of emigration is increasing in wealth for low wealth individuals and decreasing in wealth for high wealth individuals in rural Mexico (individuals living in localities with less than 2,500 inhabitants), consistent with the existence of wealth constraints and with the findings in McKenzie and Rapoport (2007a) for the Mexican Migration Project[3] database. However, the result for urban Mexico is that there is no relationship between wealth and the emigration probability. This could be used to explain why there is positive selection in rural

[2]Whether decreasing migration costs in productive characteristics will lead to more or less negative selection depends on which side of the distribution of productive characteristics is relatively more affected by the policy. Tougher enforcement unambiguously reduces migration flows at both extremes of the distribution of productive characteristics but the effect on the average individual who migrates is theoretically uncertain in this case.

[3]The Mexican Migration Project, developed by Princeton University and the University of Guadalajara, surveys rural communities in Mexico. For more information, see http://mmp.opr.princeton.edu/.

Mexico whereas there is negative selection of emigrants from Mexican urban areas.

As for the ability of skill prices to account for the different selection patterns, simple Mincer regressions are used first to show that the return to education in rural Mexico does not seem to be low enough to generate positive selection of emigrants to the United States. This finding is confirmed by the fact that observable skills account for a higher part of the observed degree of selection in urban Mexico than in rural Mexico. In order to estimate wages based on observable skills, the counterfactual wage density estimation procedure developed by DiNardo, Fortin, and Lemieux (1996) and applied by Chiquiar and Hanson (2005) is used.

Finally, network effects are shown to be more relevant in shaping migration decisions in rural Mexico although networks, as defined by McKenzie and Rapoport (2007b), are more present in urban Mexico. When networks are added as an additional observable variable to the DiNardo, Fortin, and Lemieux (1996) counterfactual wage estimation, much more of the observed degree of positive selection in rural Mexico can be accounted for. When networks and wealth are jointly considered, all of observed degree of positive selection in rural Mexico is accounted for whereas they have no impact on explaining negative selection in urban Mexico.

The structure of the paper follows. First, the economic theory underlying this study is sketched. Second, a description of the ENET dataset and several stylized facts is presented. The following section explores how well different theories are able to explain the opposed selection patterns in rural and urban Mexico. Finally, the main conclusions of the paper are drawn.

2 Emigrant Selection Theory

This section reviews three simple variations to the classical selection framework derived by Borjas (1987) from the combination of the Roy (1951) selection model and the Sjaastad (1962) idea that migration is an investment decision in which individuals make the utility maximizing choice out of a set of alternatives. These variations offer explanations to the fact that emigrant selection patterns differ in rural and urban Mexico.

Following Borjas (1999), positive selection is defined as a situation in which[4]:

[4]Borjas (1999) definition actually also includes that the earnings of immigrants will be higher than those of natives in the host country as long as the base average wage both groups have access to is the same.

$$E\left(\log w_0|\text{emigration}\right) > E\log\left(w_0|\text{no emigration}\right)$$

where w_0 represents the wage level in the original location (rural or urban Mexico in this case).

Positive selection implies that emigrants are on average more productive (as reflected on their wage) than non-migrants. The above inequality can be easily computed from the ENET data for the Mexico-US case since both the wages of non-migrants and migrants right before migration can be observed. In addition, the difference between the two expectations can be interpreted as the degree of selection (DS):

$$DS \equiv E\left(\log w_0|\text{emigration}\right) - E\left(\log w_0|\text{no emigration}\right)$$

2.1 The differential returns to skill explanation

First, following Borjas (1987) and his simpler exposition in Borjas (1999), consider the case where migration costs, in time equivalent units are constant across skill levels so that emigrant selection is determined by the differences in returns to skills among competing destinations. Suppose that individuals maximize utility on a period by period basis and that their decisions for each period do not affect their outcome in subsequent periods[5]. Utility consists of their log wage income net of time equivalent migration costs. Of course, migration costs are not incurred if the individual decides to stay home. Otherwise, there are three alternative destinations: rural Mexico ($0R$), urban Mexico ($0U$) and the United States (1). The structure of wages in each of these places is given by:

$$\begin{aligned}
\log w_{0R} &= \mu_{0R} + \delta_{0R}x \\
\log w_{0U} &= \mu_{0U} + \delta_{0U}x \\
\log w_1 &= \mu_1 + \delta_1 x
\end{aligned}$$

Individuals performance in the labor market depends on a vector of observable and unobservable characteristics summarized in the variable $x \geq 0$, whose density function over the

[5]Alternatively, think of a Mincerian world (Mincer (1958)) where wages are constant over time or, in a more sophisticated yet still simple version, where the best prediction about future wages can be obtained from current wages

population is $f(x)$. It can be assumed that base wages are ordered $\mu_1 > \mu_{0U} > \mu_{0R} > 0$ whereas no assumption will be made by now with respect to the returns to skill coefficients δ_1, δ_{0U} and δ_{0R}.

An income maximizing individual will migrate whenever the wage in the destination j net of migration costs ($C_{ij} > 0$) exceeds the wage at her original location i or other possible destinations. This can be expressed with the following function:

$$I^{ij}(x) \equiv \log\left(\frac{w_j}{w_i + C_{ij}}\right) \simeq \log w_j - \log w_i - \pi_{ij}$$

where $\pi_{ij} = \frac{C_{ij}}{w_i}$ are migration costs in time-equivalent units. As a result, emigrants from rural Mexico to the US will be characterized by:

$$I^{0R1}(x) > 0 \text{ and } I^{0R1}(x) > I^{0R0U}(x)$$

and emigrants from urban Mexico to the US will satisfy:

$$I^{0U1}(x) > 0 \text{ and } I^{0U1}(x) > I^{0U0R}(x)$$

Suppose π_{ij} are considered constant across characteristics and also that $\pi_{ij} = \pi \ \forall i \neq j$, then the existence of positive selection in emigration from rural Mexico to the United States would imply:

$$\delta_{0R} < \delta_1$$

whereas negative selection in emigration from urban Mexico to the United States would require:

$$\delta_{0U} > \delta_1$$

Thus, the expression to be tested with the ENET dataset is:

$$\delta_{0U} > \delta_1 > \delta_{0R} \tag{1}$$

2.2 The networks effect explanation

A second reason why different patterns of selection arise in rural and urban Mexico can be found in the existence of migration networks. Munshi (2003) showed that the existence of

Mexican migrant networks improve the economic opportunities of Mexican migrants in the United States, thus increasing the return to emigration. On the other hand, Carrington, Detragiache, and Vishwanath (1996) or McKenzie and Rapoport (2007a) among others showed that migrant networks also help reducing the costs of the migratory move. Both phenomena can be modeled as a negative relationship between network size and migration costs: $\pi(n, x)$, with $\frac{\partial \pi}{\partial n} < 0$ and $\frac{\partial \pi}{\partial x} < 0$ where n is the network size. Under these conditions and assuming also that $\delta_{0U} = \delta_{0R} = \delta_0 > \delta_1$, McKenzie and Rapoport (2007b) prove two propositions:

Proposition 1 *Larger migrant networks increase migration incentives (i) at all productive characteristics (x) levels, and (ii) more so at low x levels.*

Proposition 2 *With intermediate self-selection, where the support of x is $[0, \bar{x}]$ and $x_L > 0$, $x_U < \bar{x}$, where x_L and x_U represent the minimum and maximum level of productive characteristics x at which people emigrate, (a) An increase in the migration network increases the range of lower x levels that wants to migrate more than it increases the range of higher x levels that wants to migrate. (b) Providing that $f(x)$ is not increasing in x, larger migration networks reduce average levels of x among migrants (and increase average levels of x among non-migrants), therefore increasing the likelihood and/or degree of migrants' negative self-selection.*

Again, the implications are testable with the ENET dataset. If the existence of different migrant network structures in rural and urban Mexico were to explain their different selection patterns, it should be the case that migrant networks are more present in urban than in rural Mexico. In addition, caeteris paribus, higher levels of migration networks should be correlated with higher degrees of negative selection.

2.3 The wealth constraints explanation

Finally, a third reason why selection patterns could be so different between urban and rural Mexico is the possible existence of wealth constraints affecting the migration decision in rural but not in urban Mexico.

In general, the structure of migration costs can give rise to many different migration patterns characterized by positive, negative or intermediate selection. A priori, the relationship between productive characteristics and migration costs can be argued to go in both directions (Ibarrarán and Lubotsky (2007)). More productive individuals may decide to migrate legally to be able to enjoy high returns to their characteristics in the destination country (Hanson (2006)). Migrating legally usually requires longer waiting times with the corresponding higher costs so that we would observe a positive relationship between migration costs and skill levels. In general, endogenizing migration costs will lead to this positive relationship even for illegal migrants since they may decide to spend more on better illegal crossing strategies (Gathmann (2004)) or even on their traveling.

On the other hand, since the relevant concept of costs refers to time-equivalent units, it is obvious that the same level of real costs becomes more onerous for low wage individuals. However, there is a more interesting case in which migration costs end up being decreasing in productive characteristics: the case of wealth constraints. The reason why this is more interesting is that the relevance of wealth constraints in the migration decision can actually be tested, unlike other models of migration costs which are based on unobservable variables. An individual is constrained in wealth when she would be willing to migrate given her expected return to migration ($I^{ij}(x) > 0$) but she cannot afford the trip. If credit markets worked efficiently, this individual should be able to borrow in order to undertake migration. Assuming that the credit market is not very developed or simply that collateral is required in order to obtain a loan, Hanson (2006) suggests an easy way to incorporate a wealth constraint to the migration decision:

$$\gamma_i C_{ij} \leq Y$$

where γ_i represents the fraction of the loan that must be collateralized and Y denotes the wealth level of the individual. It can be assumed that this wealth level is positively related to the productive characteristics of the individual:

$$Y = \rho + \sigma x$$

where $\rho > 0$ stands for the part of wealth which is unrelated to productive characteristics and $\sigma > 0$ reflects the positive relationship between productive characteristics and wealth.

Assume again that $\delta_{0U} = \delta_{0R} = \delta_0 > \delta_1$ and further that $C_{0R1} = C_{0U1} = C$. Given this additional constraint, individuals will decide to migrate from i to j whenever the following inequalities are satisfied at the same time:

$$
\begin{aligned}
I^{ij}(x) &> 0, I^{ij}(x) \geq I^{ih}(x), \forall i \neq j, h \\
x &\geq \frac{\gamma_i C - \rho}{\sigma} \equiv x_i^{CC}
\end{aligned}
$$

Under these conditions, the degree of selection will only depend on the value of γ_i. In fact, the degree of positive selection will be increasing in γ_i since higher levels of wealth constraints imply that the minimum level of skills at which individuals start to emigrate is higher. Thus, if differential levels of wealth constraints were to explain the different patterns of emigrant selection between urban and rural Mexico, it should be the case that:

$$
\gamma_{0R} > \gamma_{0U} \tag{2}
$$

so that the degree of positive selection is higher in rural than in urban Mexico. This is another test that can be performed in the ENET.

The described situation is depicted in figure 1.

(Figure 1)

The following section reviews the ENET dataset and describes the different selection patterns found in rural and urban Mexico.

3 The ENET Dataset

The Encuesta Nacional de Empleo Trimestral (ENET) is a nationally representative household survey that was carried out quarterly by the Mexican Instituto Nacional de Geografía y Estadística (INEGI (2005)) between the second quarter of 2000 and the last quarter of 2004. This labor force survey is similar to the American CPS and it has been used in a number of different studies[6].

The ENET has a panel structure that follows Mexican households for five consecutive quarters. Every quarter, one fifth of the sample is renewed[7]. For the remaining four fifths,

[6] Robertson (2000) or Fernández-Huertas Moraga (2007) are two examples.

[7] Attrition rates in the sample are detailed in the appendix. The results are robust to the inclusion or exclusion of quarters in which the attrition level is high. In addition, the observations that disappear from the sample are not statistically different from the observations that remain in the sample in the main observable characteristics.

a person who is present in the quarter in which her household is observed but moves to the United States (or elsewhere) in the following quarter is considered an emigrant[8]. The characteristics of future emigrants can be compared directly to the characteristics of future non-migrants at the same point in time.

Table 1 presents these characteristics for migrants and non-migrants first in Mexico as a whole and then disaggregated for both rural and urban areas.

(Table 1)

For Mexico as a whole, the table reproduces the negative selection result reflected in Fernández-Huertas Moraga (2007). Concentrating on the working age population, Mexican male emigrants to the United States earned an average wage of 1.4 2006 US dollars per hour the quarter before they emigrated, lower than the average wage of 2.1 dollars earned by non-migrants. The same negative selection result is obtained for women. However, dividing the overall population between urban and rural Mexico, where rural Mexico refers to people living in localities with less than 2,500 inhabitants, it can be observed that the negative selection result is not homogeneous throughout the country. Rural Mexico represents 22 per cent of the overall Mexican population but rural Mexican emigrants to the United States account for 45 per cent of male migrants and for one third of female migrants. Thus, rural emigrants are over-represented in the total emigration flow.

The mechanisms that generate the self-selection of emigrants in rural and urban Mexico must necessarily be different since positive selection characterizes migration flows out of rural Mexico whereas negative selection is obtained if we only look at urban Mexico. Male emigrants out of rural Mexico earn an average wage of 1.1 dollars per hour, higher than the 1 dollar per hour wage of those who do not emigrate out of rural areas. In contrast, male emigrants out of urban Mexico earn 1.6 dollars per hour, much less than the 2.3 dollars per hour usual wage obtained by those who remain behind.

In terms of other observable characteristics presented in table 1, emigrants are shown to be younger than non-migrants both in rural and in urban Mexico (29 versus 35 years old) whereas the education levels are in line with the selection result in terms of wages. Whereas male emigrants out of urban Mexico tend to have 1.3 less years of education than non-migrants, male emigrants out of rural Mexico present 0.7 more years of education than non-migrants.

[8]See the data appendix for ENET total migration numbers.

Working-age women behave differently from men in Mexico as a whole and do not present relevant differences (except in levels) between rural and urban Mexico. Female emigrants to the US are negatively selected in terms of wages both in rural and in urban Mexico but they are positively selected in terms of education both in rural and urban Mexico. The explanation might be found in the fact that many women are tied-movers, that is, they accompany family members or travel to join them instead of moving for economic reasons so that there is a small percentage of female emigrants that actually work and earn a wage relative to men. This is the reason why what follows will focus on the behavior of male emigrants.

3.1 Robustness of the selection result

There are several potential shortcomings in using the ENET to study emigrant selection. First of all, by construction, whole households who migrate together are missed by the survey. This introduces a bias towards finding negative selection. However, as Fernández-Huertas Moraga (2007) explains, the education level of missing emigrants would need to be 3 years higher than that of those counted by the survey (0.4 is the observed difference in US sources) and the undercount rate the highest estimated (25 per cent according to Ibarrarán and Lubotsky (2007)) in order to cut the negative selection result in terms of education for males in half.

Secondly, the definition of emigrants as people who leave Mexico in the following quarter to that in which their wage observation is recorded could be playing a role in the negative selection result. It could be the case that emigrants accept lower wages just before they decide to leave the country (Ashenfelter dip). If this were to be the case, it would be more appropriate to use a different definition of emigrant, for example, those who leave the country a year after they are surveyed for the first time. The structure of the ENET allows following the evolution of the wages of a fifth of the sample for four quarters before they decide to leave the country. This information is presented in figure 2.

(Figure 2)

Figure 2 shows the average wage level of future male Mexican emigrants to the United States four, three, two and one quarters before they leave the country. There are no statistically significant differences between the wage levels of those who will leave in a quarter and those who will leave in four. For completeness, the average wage level recorded for emigrants who just returned from the United States is also represented. This addresses a third potential problem with the ENET dataset. The ENET records the selection of the flow of emigrants whereas previous studies, notably Chiquiar and Hanson (2005), concentrated on the stock of immigrants already present in the receiving country. Although looking at the flow is more relevant in order to understand the mechanisms that determine selection, looking at the stock becomes more important when studying the effects of immigration on receiving countries (see Borjas (2003)). In this sense, the negative selection result found for Mexican emigration should be corrected by the degree of selection of returning migrants from the United States. However, figure 2 shows that the average wage returned migrants earn is not significantly different from the average wage of emigrants suggesting there are not relevant differences between the two groups. In fact, return male migrants in the ENET turn out to be three years older on average than non-migrants and to have 0.4 less years of schooling than emigrants to the United States. Although this last number is probably biased downwards by the fact that the ENET misses returned migrants who do not come back to established households (those who create new households), the magnitude of the difference is again too small compared with the negative selection in schooling years for males reflected in the ENET.

Finally, the ENET does not differentiate between emigrants who settle in the United States for a while and those who go back and forth often (see Fernández-Huertas Moraga (2007) for details). Thus if, as Hanson (2006) suggests, temporary or seasonal migrants were to be on average less educated than permanent migrants, there would be another source of bias in the ENET towards finding negative selection. It does not seem that this effect is quantitatively relevant since temporary migrants are enumerated as returned migrants in the quarters in which they come back to Mexico and figure 2 shows that there are no significant differences between returned migrants and emigrants in terms of wages. In addition, if there were substantial differences between seasonal migrants and more permanent ones, there should be differences in the characteristics of emigrants depending on the quarter on which their observation was taken. This is what is shown in figure 3 for male wages in urban and rural Mexico.

(Figure 3)

Figure 3 confirms that the composition of the emigrant flow is not affected by seasonality in terms of wages neither in rural nor in urban Mexico. Similar results are obtained for other characteristics, such as age or education. The existence of seasonality on migration flows, noticed by Hanson and Spilimbergo (1999) among others and present also in the ENET (see appendix), does not significantly alter the negative selection result for urban Mexico and the positive selection result for rural Mexico.

3.2 Effects of observables and unobservables

Since Mexican emigrants to the United States are younger than non-migrants, one could think that the negative selection result in terms of wages results from a seniority effect. Older individuals have more experience in the labor market and are thus able to obtain higher wages. Although this is true, if we compute selection at different age levels, we still find negative selection for Mexico as a whole. In general, it is interesting to understand which part of the selection result is due to differing observable characteristics of emigrants and which part of the result is due to unobservable characteristics. One way of performing this calculation non-parametrically is to use DiNardo, Fortin, and Lemieux (1996) reweighing procedure, following Chiquiar and Hanson (2005) and Fernández-Huertas Moraga (2007), both for urban and rural Mexico.

First, figure 4 shows how the wage distribution of male emigrants and non-migrants reflects the negative selection result for urban Mexico and the positive selection result for rural Mexico. The wage distribution is calculated as the kernel density estimate[9] of the distribution of the logarithm of real hourly wages in 2006 dollars relative to their quarter average (to avoid time trend effects) registered for the group of migrant and non-migrant men aged 16 to 65 years old in the period going from the second quarter of 2000 to the third quarter of 2004. The wage distribution is calculated both for rural and urban Mexico. In the case of urban Mexico, it can be seen that the wage distribution of migrants lies to the left of the wage distribution of non-migrants, evidencing the existence of negative selection. The distance between the averages of both wage distributions, previously defined as the degree of selection, is -0.28. For rural Mexico, both wage distribution are displaced to the left of the

[9] The estimated density is $\hat{g}(w) = \frac{1}{hN}\sum_{i=1}^{N} K\left(\frac{w-w_i}{h}\right)$ where N is the number of observations. $K(u) = \frac{3}{4}(1-u^2)$ for $-1 < u < 1$ and $K(u) = 0$ otherwise is the Epanechnikov kernel, where $u = \frac{w-w_i}{h}$. The optimal bandwidth (Silverman (1986)) is $h = 0.9\hat{\sigma}N^{-\frac{1}{5}}$ with $\hat{\sigma} = \min\{S, \frac{IQR}{1.349}\}$ where S is the sample standard deviation and IQR is the inter-quartile range. To prevent over-smoothing and following Leibbrandt, Levinsohn, and McCrary (2005), I use a bandwidth which is 0.75 times this optimal level.

urban wage distributions but this time most migrant wages lie to the right of non-migrant wages, suggesting the existence of positive selection out of rural Mexico. The computed degree of positive selection is 0.17.

(Figure 4)

Figure 5 rewrites the result offered in figure 4 as the difference between the density of migrant wages and the density of non-migrant wages, both for urban and rural Mexico. The concentration of positive mass to the left of the median wage level (vertical solid line in figure 5) reflects negative selection in the urban Mexico graph whereas the opposite is true for rural Mexico.

(Figure 5)

As pointed out above, the representation of actual wage distributions in figures 4 and 5 could just be reflecting the existing differences, described in table 1, in the observable characteristics of migrants and non-migrants out rural and urban Mexico. To understand to what extent the selection result could be explained by observable characteristics, the information on emigrant wages in the ENET is ignored and their wage distribution is inferred only from their observable characteristics, whose market prices are obtained from regressing the wages of non-migrants on the productive characteristics of non-migrants, as suggested by DiNardo, Fortin, and Lemieux (1996) and Chiquiar and Hanson (2005).

Following the exposition in Fernández-Huertas Moraga (2007), the actual wage distribution of non-migrants ($g_{NM,0}(w)$) computed in figure 4 can be compared now not to the actual wage distribution of emigrants ($g_{M,0}(w)$) but to a counterfactual wage distribution ($\hat{g}_{M,0}(w)$) built from their observable characteristics. The actual wage distributions can be rewritten as:

$$g_{i,0}(w) = \int f_{i,0}(w|x)\, h_{i,0}(x)\, dx; i = NM, M$$

where $f_{i,0}(w|x)$ represents how the wage responds to changes in observables characteristics x and $h_{i,0}(x)$ is the density of characteristics at location 0 for individuals in situation i. Now, instead of directly observing $g_{M,0}(w)$, assume that this has to be estimated from the observable characteristics of emigrants. Formally, the required counterfactual is:

$$\hat{g}_{M,0}(w) \equiv \int f_{NM,0}(w|x)\, h_{M,0}(x)\, dx$$

that is, the estimated wage distribution of emigrants will be based on the way observable characteristics of non-migrants are rewarded: $f_{NM,0}(w|x)$. In order to do this, DiNardo, Fortin, and Lemieux (1996) suggest the following. First, rewrite the density as:

$$\hat{g}_{M,0}(w) = \int f_{NM,0}(w|x)\, h_{M,0}(x)\, dx = \int f_{NM,0}(w|x)\, h_{NM,0}(x)\, \frac{h_{M,0}(x)}{h_{NM,0}(x)} dx$$

This is equivalent to reweighting the non-migrant wage distribution by the factor $\theta \equiv \frac{h_{M,0}(x)}{h_{NM,0}(x)}$, which can be computed using Bayes' theorem as:

$$\theta = \frac{h_{M,0}(x)}{h_{NM,0}(x)} = \frac{\frac{P(M|x)}{1-P(M|x)}}{\frac{P(M)}{1-P(M)}}$$

$P(M|x)$ can be estimated from a logit model of the probability of emigration[10] regressed on observable characteristics whereas $P(M)$ refers to the proportion of emigrants in the sample. The result from estimating $\hat{g}_{M,0}(w)$ can be observed in figure 6.

(Figure 6)

Figure 6 shows the kernel density estimate of the non-migrant wage distribution (solid line) already calculated in figures 4 and 5 together with the counterfactual density (dashed line) corresponding to the wage emigrants should be earning according to their observable characteristics. As a result, the difference between the two densities reflects the part of selection that is due only to observable characteristics of the migrants. The rest of the difference with the actual wage distribution of the emigrants can be considered as the effect of unobservables in selection. To see more clearly the differences between the actual and counterfactual wage distributions, figure 7 is constructed in the same way as figure 5.

(Figure 7)

The difference between the graphs in figure 7 and figure 5 can be summarized in terms of averages. The degree of selection on observables can be computed as the difference between the average of the counterfactual migrant wage distribution and the average of the actual non-migrant wage distribution. This degree of selection on observables is -0.17 for urban Mexico and 0.08 for rural Mexico. This means that the degree of selection on observables coincides in sign with the actual degree of selection: positive for rural and negative for urban Mexico. Observable characteristics account for 60 per cent of the observed negative selection

[10]The logit regresses the migration dummy from the ENET on the following variables (used in Chiquiar and Hanson (2005)): schooling groups, age, age squared, marital status and interactions of these variables with the schooling groups. The results of this auxiliary regression are available from the author upon request.

in urban Mexico and for 48 per cent of the observed degree of positive selection in rural Mexico.

There are a multiplicity of factors that could be related to the unobservable component of the degree of selection. The negative selection on unobservables in urban Mexico could in principle be related to the existence of an Ashenfelter dip that reduces wages right before migration but figure 2 seems to suggest this is not the case. In addition, rural Mexico presents the opposite result so this is an unlikely explanation. Another explanation could be the existence of low unobserved ability in the case of urban Mexico emigrants (Borjas (1987)) together with high unobserved ability for emigrants out of rural Mexico (Chiswick (1978) and Chiswick (1999) explain a variety of reasons why emigrants could be positively selected in unobservables). Furthermore, access to networks is another unobservable component in these calculations so that negative selection in urban Mexico could be hiding a worse access to networks in this area as opposed to rural Mexico, where the positive selection in unobservables could be hiding a better access to local networks. If this was the case and local networks were correlated with migration networks, the result would go in the opposite direction of the McKenzie and Rapoport (2007b) explanation by which positive selection in rural Mexico could be partly due to the lack of access to migration networks in this area of the country. Finally, the existence of wealth constraints affecting selection would be another unobservable component that could explain why unobservables are more relevant in rural than in urban Mexico, consistent with the existence of positive selection in rural Mexico and negative selection in urban Mexico. The two latter explanations will be reviewed in the next section of the paper, together with the classical Borjas (1987) argument.

4 Explaining differing selection patterns

This section explores which of the three theories summarized in section 2 could better accommodate the existence of positive selection in rural Mexico together with negative selection in urban Mexico in the period 2000-2004: differential returns to skill, network effects or wealth constraints.

4.1 Differential returns to skill

The expression to test is the inequality (1) in section 2. If the returns to skill were higher in urban Mexico than in the United States and, in addition, higher in the United States than in rural Mexico, then that could explain why positive selection prevails in rural Mexico while there is negative selection in urban Mexico and this would confirm Borjas (1987) classical theory.

The main problem with such a test is to determine the concept of returns to skill that would be relevant to the migration decision. Most of the literature identifies the theoretical δ's with the return to education[11]. Under this identification, running simple Mincer regressions on rural and urban Mexico and on Mexican immigrants in the United States and comparing the coefficients on the return to schooling can be done as an approximation to the test. Table 2 presents the results from this exercise. The data for Mexican immigrants in the United States come from the American Community Survey (ACS; see Ruggles, Sobek, Alexander, Fitch, Goeken, Hall, King, and Ronnander (2004)) and, for comparability purposes, it refers to recent Mexican immigrants in the United States, defining them as those who arrived there a year before the survey takes place.[12]

(Table 2)

Concentrating on the coefficient of schooling years, table 2 shows that the market price of an additional year of education is slightly higher in urban Mexico than in rural Mexico and also higher in both cases (0.09) than in the United States (0.03). These estimates are in line with the findings reported in Hanson (2006) and would imply negative selection of Mexican emigrants to the United States both out of rural and of urban Mexico. The only contribution to the previous literature is the calculation of the schooling coefficient both for urban and for rural Mexico, which turns out to be of similar magnitude although significantly higher (at a 95 per cent confidence level) in urban Mexico than in rural Mexico. These results would suggest that the Borjas (1987) hypothesis, summarized by equation (1), can be rejected. However, table 2 also presents the calculation of Mincer regressions only for the population

[11] Cragg and Epelbaum (1996), Hanson (2006) and Ibarrarán and Lubotsky (2007) are just some examples.

[12] Summary statistics for the ACS are provided in the data appendix. Alternative definitions of Mexican immigrants in the US do not alter the results. The ACS is preferred to other sources, like the Current Population Survey in the United States, because it enumerates more immigrants than the latter. Still, the ACS is likely to under-count Mexican immigrants in the US, especially if they are undocumented (see Hanson (2006) and Fernández-Huertas Moraga (2007) for details).

of future working-age Mexican emigrants to the United States. Confining out attention to this sample, which is the one that ultimately emigrates, it can be observed that the return to an additional year of schooling is still higher in urban Mexico (0.06) than in rural Mexico (0.04) and for both higher than in the United States (0.03). The returns to education are in both cases significantly lower for emigrants than for the rest of the population. In the case of rural Mexico, although the point estimate suggests otherwise, it is no longer possible to reject the hypothesis that the return to an additional year of schooling is lower in rural Mexico than in the United States so that equation (1) could still be true.

Heckman, Lochner, and Todd (2003) question the appropriateness of using traditional Mincer regressions to compute the return to education. Lacking the desired data, addressing all of the concerns that they stress is out of the scope of this paper. Still, they argue that one of the quantitatively more important biases in the calculation of rates of return arises from the assumptions of linearity in education and from the separability between schooling and work experience. Relaxing the assumption of linearity does not alter the conclusions from table 2, as it can be observed in figure 8.

(Figure 8)

Figure 8 graphs the coefficients from regressing log wages on the same variables as in table 2, but this time substituting the schooling years variable for several schooling categories. The first graph shows that the structure of schooling returns is similar in urban and in rural Mexico and clearly above the returns to schooling for Mexican immigrants in the US. The second repeats the exercise just for Mexican emigrants. Although the graphed point estimates suggest that returns to schooling are higher for Mexican emigrants out of rural Mexico at low schooling levels and higher for emigrants out of urban Mexico at high schooling levels, the fact is that none of this results is statistically significant at a 95 per cent confidence level.

It could be argued that education is not the only skill valued by the market. In this sense, Borjas (2003) assumes competition in the labor market happens at narrow skill levels, where skills are defined by education-experience cells. Also, Hanson (2006) shows how the Mexico-US wage differential varies by education-experience cell. Unfortunately, data problems do not allow the replication of this exercise. The standard errors of the ACS become too large when the wage data are disaggregated by education-skill cells and the same can be said about the wage data for Mexican emigrants in rural areas in the ENET.[13]

The conclusion is thus that Borjas (1987) theory seems to perfectly fit the selection of emigrants out of urban Mexico but it has more problems predicting the selection pattern out of rural Mexico despite the fact that the validity of the theory cannot be clearly rejected. This is not surprising, as shown in the previous section, taking into account that observable characteristics were only able to explain 48 per cent of the actual degree of positive selection of emigrants out of rural Mexico.

4.2 Network Effects

McKenzie and Rapoport (2007b) proved propositions 1 and 2, rewritten in section 2.2 of this paper. These propositions suggest that larger migration networks should be correlated with more negative selection of emigrants. The reason is that migration networks reduce costs (or increase benefits) from migration relatively more for individuals at the low end of the skill distribution. However, the fact that this assertion is true does not say anything about its ability to disentangle the differences in selection between urban and rural Mexico. In a sense, McKenzie and Rapoport (2007b) showed the qualitative validity of propositions 1 and 2 whereas what will be assessed in this section is its quantitative relevance in explaining differing selection patterns.

McKenzie and Rapoport (2007b) perform their exercise in a different survey: the Encuesta Nacional de la Dinámica Demográfica (ENADID) for 1997[14]. Their results suggest that the effect of migration networks on the probability of emigrating for the first time to the US in the period 1996-1997 is 29 per cent lower in localities with more than 100,000 inhabitants but they do not compute directly the effect of the locality size on the degree of selection.[15] They measure their migration network variable as the proportion of individuals

[13]Results available from the author upon request.

[14]The ENADID is a nationally representative household survey that INEGI carried out in 1992 and 1997. For more information on the ENADID, see McKenzie and Rapoport (2007a) and McKenzie and Rapoport (2007b).

[15]Their coefficient on the effect of the interaction between education and the migration network on the probability of emigrating becomes less negative (implying less negative selection) when they take localities larger than 100,000 inhabitants out of the sample. Although this difference is not significant, this would go against the fact that negative selection prevails in urban Mexico whereas positive selection prevails in rural Mexico.

aged 15 and over in a given community (municipality) who have ever migrated[16]. Unfortunately, this information is not present in the ENET[17]. For comparability purposes, I use their migration network variable calculated from the ENADID in what follows.

First, table 3 presents some preliminary evidence by reproducing the summary statistics computed in table 1 but this time dividing the sample between municipalities with high community migration prevalence (high migration network) and low community migration prevalence (low migration network), with the cutoff value determined by the median at the national level (24 per cent).

(Table 3)

At this level of disaggregation, table 3 says little about the role of migration networks in shaping migrant selection. The dichotomous migration network variable seems to be related to the level of wages and schooling years both in rural and in urban Mexico but there does not seem to be any substantial difference between migrants and non-migrants in both groups. The only exception is the part of rural Mexico with high network prevalence, where the positive selection result in terms of schooling years remains but it is overturned in terms of wages (the difference is not statistically significant though) as theory would predict. It is somehow surprising that in high network areas emigrants tend to come from counties where the presence of networks is lower than in those counties in which non-migrants concentrate. Only in low network areas in rural Mexico it is possible to find the expected result that emigrants live in areas with higher network levels than non-migrants. The emigration rate to the United States is higher in low network areas than in high network areas in urban Mexico but the opposite is true for rural Mexico. This suggests, as McKenzie and Rapoport (2007b) point out, that the role of networks in the migration decision is more relevant in rural than in urban Mexico. Even if higher network prevalence leads to more negative selection, it does not seem likely that networks can explain the different selection patterns in urban and rural Mexico, taking into account that networks do not seem to matter much in urban

[16] Their measure is imperfect since it counts both those who have ever migrated abroad and those who have ever migrated internally. However, they show that this measure is highly correlated with other network variables and instruments used in the literature, like the 1924 state migration rates, also used by Woodruff and Zenteno (2007).

[17] In unreported results, I construct a municipal network variable from the ENET as the average municipal emigration rate to the United States of individuals aged 16 and 65 in the 2000-2004 period. The correlation coefficient between this variable and the ENADID network variable is 0.21. However, using this alternative variable as a measure of network for what follows does not change the results.

Mexico (where selection is negative) whereas they seem to be a more relevant factor in rural Mexico (where selection is positive).

A final exercise that can be performed to assess the impact of networks on the computed degree of selection is to redo the calculation in section 3.2. Figures 6 and 7 represented counterfactual wage distributions for Mexican emigrants to the United States based just on their observable characteristics. Those observable characteristics (schooling, age and marital status) were able to explain 60 per cent of the actual degree of negative selection for urban Mexico (-0.28) and just 48 per cent of the actual degree of positive selection (0.17) for urban Mexico. Stretching the spirit of the DiNardo, Fortin, and Lemieux (1996) reweighing procedure, assume that the network prevalence variable constitutes another observable characteristic that can be used when computing counterfactual wages. This should be considered as a mere accounting exercise since migration networks should not in principle have any effect on wages at home. If such effects are present, they should be attributed to a correlation between migration networks and networks at home or to some spurious correlation between migration networks and economic conditions (suggested by table 3). With these caveats in mind, the result from including migration networks in the computation of counterfactual wage densities for emigrants in rural and urban Mexico[18] can be observed in figures 9 and 10.

(Figure 9)

(Figure 10)

Figures 9 and 10 appear almost identical to figures 6 and 7. Only the last panel in figure 10, referred to rural Mexico, shows a significant difference with the second panel in figure 7. Visually, it seems that adding the network variable increases the degree of positive selection that observables can explain in rural Mexico. This is confirmed by looking at the averages. The average degree of selection in figure 9 for urban Mexico is -0.18. This is 64 per cent of the actual degree of negative selection. Thus, adding networks only increases the explanatory power of observables by four percentage points for the case of urban Mexico, consistent with the observation from table 3 that networks did not seem to play a large role in the migration decisions out of urban Mexico. The result is different for rural Mexico, though. The degree of selection stemming for figures 9 and 10 is 0.15. This means that observables are now able

[18]See section 3.2 for an explanation of the computation of the wage counterfactual. The weights are calculated as in footnote 10 and adding the network variable and its interaction with the schooling categories. Results from the auxiliary logit regression are available from the author upon request.

to explain 86 per cent of the actual degree of positive selection in rural Mexico, 38 percentage points more than when networks were not included. Again, this confirms what was already deduced from table 3. Networks seem to play a very relevant role in rural Mexico but not in urban Mexico.[19]

The conclusion from this section is that network variables seem unlikely to be able to explain by themselves why there is positive selection in rural Mexico and negative selection in urban Mexico. Propositions 1 and 2 would suggest that network effects on the degree of selection should be more pronounced in urban than in rural Mexico but the ENET survey does not seem to support this view. The next subsection explores a third possible explanation to the differing selection patterns.

4.3 Wealth constraints

The fact that migration is generally a profitable investment does not mean that every person who could obtain this profit will actually emigrate. It could be the case that low-income individuals willing to emigrate cannot do so because they lack the financial resources to cover the migration costs. If this is the case, they could borrow to start the trip but sometimes they do not have the possibility of borrowing, possibly because the financial sector in the area in which they live is not specially developed, possibly because they do not have access to a network (family or friends) that can lend them the money. If this is the case, this individual will be considered wealth constrained. Wealth constraints could be able to explain why emigrant selection in positive in rural Mexico and negative in urban Mexico. The reason is that even when low-skill individuals have relatively more incentives to migrate in both areas, because of the Borjas (1987) argument, it could be the case that these individuals are constrained in rural Mexico and not in urban Mexico. This is the issue that this section will address.

The existence of wealth constraints, in addition to be able to sort out the rural-urban emigrant selection difference, is key to understanding the consequences of migration policy on the selection of emigrants. Borjas (1987) simplest model of negative selection, presented

[19] In principle, the network variable could be capturing any municipality-specific component affecting the migration decision since it is the only variable that changes at a municipal level. However, McKenzie and Rapoport (2007b) showed that the migration network variable effects did not disappear or change their magnitude even if they added municipality dummies to their main regression.

in section 2, suggests that any increase in migration costs, such as tougher enforcement at the border, will lead to an increase in negative selection. However, if migration costs are decreasing in the productive characteristics of the emigrant-sending country population, this does not need to be the case and the selection of emigrants could actually improve.

Observable migration costs seem too small to justify the fact that the real hourly wage is between four and five times larger in the United States for Mexican immigrants than in Mexico (ACS data for 2000-2004, see data appendix). This leads Hanson (2006) to consider that the real puzzle is why more people do not migrate than they are doing now, which is another way of saying that migration costs must be incorporated to any modeling of the migration decision. It appears that the most important migration costs are not observable so that it is difficult to estimate directly their relationship with the productive characteristics of the population.

There is one particular theory of migration costs decreasing in observable characteristics that can be tested with the ENET data: the relevance of wealth constraints in the migration decision. The reasoning is that individuals whose expected utility is higher in the United States decide to remain in Mexico not necessarily because they cannot afford their trip but because they need to provide a buffer of savings for their family for the time it will take them to start sending remittances, for the probability of not being successful in crossing the border in the case of undocumented migrants, etc. For these individuals, the probability of emigrating should be increasing in a measure of their wealth, independently from their wage level.

Once a year, in the second quarter, the ENET surveys the characteristics of the building where the household lives, which enables the construction of a household wealth index. Filmer and Pritchett (2001) suggest that a principal components analysis can be used to this end. If this index is a good proxy for wealth (McKenzie (2005)) and there exist wealth constraints in migration, the decision to migrate should be positively related to the index, controlling for other observables and wage income, for low wealth individuals and have no relation to migration for high wealth individuals.

The construction of the index takes advantage from six questions about housing characteristics in the ENET. These questions refer to the ownership of the building, whether it is a house or an appartment, floor, wall and roof materials, number of rooms and bedrooms, kitchen and bathroom facilities, utilities included (water, electricity, phone, sewerage...) and antiquity of the building. In total, there are thirty-six characteristics from which dummy variables are constructed taking a value of 1 if it is present and 0 otherwise, except for the number of rooms and bedrooms. Filmer and Pritchett (2001) show that such a set of dummy variables can be used to construct an index through principal components analysis which does a good job in approximating household wealth by comparing the distribution arising from the index from that arising from traditional measures of wealth in expenditure and income household surveys in Indian states. Filmer and Pritchett (2001) methodology has been extensively used. In particular, for the case of Mexico, McKenzie (2005) shows that such a household wealth index performs well in approximating measures of wealth taken from the ENIGH (Encuesta Nacional de Ingresos y Gastos de los Hogares), the official Mexican income and expenditure household survey, in 1998.

McKenzie (2005) constructs one general wealth index out of thirty asset characteristics present in the ENIGH. In addition, he shows that three other indices made out of subgroups of characteristics also provide a good measure of wealth: a housing characteristics index, a utilities index and a durables index. Unfortunately, the ENET does not provide information on durables ownership but it has some other indicators not present in the ENIGH, such as kitchen equipment. Given these considerations, two wealth indices are constructed from the ENET data in table 3. On the one hand, one that replicates the utilities and housing characteristics index from McKenzie (2005). On the other hand, one that uses all the available information in the ENET with its thirty-six components. The construction of both is detailed in table 4.

(Table 4)

Table 4 shows that both indices are coherent in the sense that they produce a reasonable ordering that can be a good approximation of wealth, as McKenzie (2005) shows. Both of them are very similar although the McKenzie index does a better job at explaining the overall variance in the first principal component: 31 per cent versus 16 per cent from the overall ENET index. As a result, the McKenzie index will be used in the calculations below although the results do not change if the overall ENET index is used instead.

The assumption to be tested is whether wealth has a positive effect on the decision to migrate, controlling for other factors (especially productive characteristics reflected in the wage), for low wealth individuals. In contrast, wealth should not be relevant in the migration decision of wealthier individuals. Given that there is positive selection among the rural population and negative for the urban population, one should expect that wealth constraints would be easier to identify and more relevant in a context of positive selection like rural Mexico.

To this end, the binary variable mig_{it} taking the value 0 if the individual remains in Mexico in the quarter following the one in which the observation takes place and 1 if the individual emigrates to the United States in the following quarter is considered as the dependent variable[20]. The regressors that should affect this variable are the log of the hourly wage ($logw_{it}$), which should have a negative effect on emigration, and all other observable characteristics of the individual: schooling, age, community migration prevalence (from the ENADID) and its interaction with education (following McKenzie and Rapoport (2007b)), family characteristics, distance to the border and dummies for time and Mexican states (X_{it}). The most interesting regressor, though, is the measure of household wealth taken from applying McKenzie (2005) index to the ENET ($asset_{it}$).

A traditional linear regression analysis of the effect of the asset index on the probability of emigration could be inappropriate if, as expected, there are non-linearities in this relationship. For this reason, a semi-parametric approach following the local linear regression method of Fan (1992) is preferred. The regression to be estimated is the following:

$$mig_{it} = G(asset_{it}) + \Gamma X_{it} + \epsilon_{it}$$

Fan (1992) shows how to apply the local linear regression method for one independent variable. Thus, the effect of all the controls must be discounted in a first step by estimating Γ. To this end, the high order differencing method of Yatchew (1998) can be used. First, the data are ordered in ascending order according to $asset_{it}$. With d_j ($j = 0...5$) denoting the optimal Yatchew (1998) differencing weights of fifth order[21], the following ordinary least squares regression can be estimated:

$$\sum_{j=0}^{5} d_j mig_{i-j,t} = \left(\sum_{j=0}^{5} d_j X_{i-j,t}\right)' \Gamma + \varepsilon_{it}$$

[20] Internal migrants and international migrants to other destinations are taken out of the sample although their inclusion does not alter the results.

[21] The weights are 0.9064, -0.2600, -0.2167, -0.1774, -0.1420 and -0.1103. Yatchew (1998) shows that differencing with these weights attains 91 per cent efficiency relative to the asymptotic efficiency bound.

The idea is that the difference between contiguous observations of the asset variable is small enough to disregard it so that $\hat{\Gamma}$ is estimated efficiently and Fan (1992) local linear regression can be run on:

$$mig_{it} - X_{it}\hat{\Gamma} \;=\; G(asset_{it}) + \eta_{it}$$

The summary statistics for the data that will be used in this estimation procedure are presented in table 5. The estimation is restricted to men aged 16 to 65 years old in order to be consistent with the previous section.

(Table 5)

There are two main differences between the summary statistics in table 1 and those in table 5. First, table 5 refers only to observations recorded in the second quarter of every year from 2000 to 2004 whereas table 1 refers to all available quarters. Second, table 5 only provides summary statistics for the observations that are actually used in the regression analysis, that is, those not presenting missing values on any of the variables. The main difference here is the exclusion of those individuals not perceiving a wage. All the regressions in this section have also been ran dropping the wage variable and, if anything, the results that will be presented are strengthened.[22]

Table 5 confirms that working-age males are much more likely to emigrate from rural Mexico (13.1 versus 4.8 emigrants per thousand in urban areas). Male individuals aged 16 to 65 in rural Mexico live in households that are much poorer than those in urban areas as measured by the McKenzie (2005) index. They also earn notably lower wages, which is consistent with an average education level that shows four less years of schooling than what is prevailing in urban Mexico. From the other categories, the most relevant information is that rural households tend to have more members than urban households (5.4 versus 4.8). Finally, network prevalence is much higher on average in urban (36 per cent) than in rural Mexico (20 per cent).

The results from estimating Fan (1992) local linear regression[23] for urban and rural Mexico can be observed in figures 11 and 12.

[22]Results available from the author upon request.

[23]The complete results from the first auxiliary regression estimating Γ are available from the author upon request. It is run on 357,257 observations and the R^2 from the regression is 0.0109. The variables included are discussed in the text and shown in table 5. Quadratic terms in age and schooling years and an interaction of the network prevalence variable with schooling years are added. The signs of the coefficients coincide for

(Figure 11)

(Figure 12)

The two panels of figure 11 separately show the estimated functions for rural and urban Mexico with their corresponding 90 per cent bootstrapped confidence intervals.[24] Figure 12 combines the rural and urban estimation for a clearer comparison. Both urban and rural Mexico seem to fit to an inverted u-shape relationship between the emigration probability and wealth. However, this result is much more pronounced in the case of rural Mexico, consistent with the findings of McKenzie and Rapoport (2007a). In the case of urban Mexico, only the poorest part of the population could be subject to some sort of wealth constraint according to this graph but it must be mentioned at this point that the extremes are precisely the values of the asset index that Filmer and Pritchett (2001) advise to take more carefully, since it tends to over-discriminate at low wealth levels and to under-discriminate at high wealth levels. For the rest of the urban Mexico sample (more than 80 per cent, by looking at the depicted wealth quintiles), there is absolutely no relationship between wealth and the probability of emigrating to the United States in the following quarter so that there does not seem to be any scope for the existence of wealth constraints affecting the emigrating decision.

On the contrary, rural Mexico's result is consistent with the existence of wealth constraints in the emigration decision. The probability of emigration is clearly increasing in the household wealth level (after controlling for all other observed factors in the ENET, including the wage, and the network variable from the ENADID) for the four lowest quintiles of the wealth distribution (figure 12 with national wealth quintiles), which, by the way, represent 98.7 per cent of the total rural population in the sample (contrast with the rural wealth quintiles in figure 11). So the big drop in the function is only due to the effect of a very tiny fraction of the rural population (1.3 per cent), which would be consistent with them being landowners[25] although the number of observations is too small and, as it was mentioned earlier, the wealth index may present problems at the extremes. McKenzie and

the more relevant variables, notably that of the education and network interaction (negative), with those reported in McKenzie and Rapoport (2007b). Following Deaton (1997), the Epanechnikov kernel is used. A bandwidth of 0.2 times the asset index range is chosen.

[24]The interval comes from the 5th and 95th percentile of the distribution originated by repeating the procedure 1000 times by randomly sampling with replacement half of the observations.

[25]McKenzie (2005) suggests that the household wealth index is also well correlated with land ownership.

Rapoport (2007a) find similarly a u-shape relationship between wealth and the probability of emigrating in the Mexican Migration Project (some areas of rural Mexico) and attribute this decreasing zone to the presence of landowners, who can obtain rents from their lands in Mexico that they cannot get in the United States so they have lower incentives to emigrate than those reflected in the typical selection model in section 2.

It would be interesting to investigate further why there are these disparate relationships between wealth and the emigration probability at the rural and urban level. A first hypothesis that could be put forth is household size. If emigrating individuals do not leave until they have accumulated enough wealth on which their family can live before they start sending remittances or in case there is a failure in getting across the border, then higher household size should be related to a greater incidence of wealth constraints. In fact, if the above estimation procedure is further divided by household size, the results point in this direction. The emigration probability of individuals belonging to households with a size above the median in the lowest wealth quintile is increasing in wealth whereas there is no relationship for individuals belonging to lower size households. The problem is that dividing the dataset too much leads to a lack of power in the estimation and the standard errors become too big to draw meaningful conclusions.[26]

A second hypothesis that could explain the rural/urban divide is the thickness of the credit market in rural and urban areas. There is some evidence that the credit market could be more developed in urban areas of Mexico than in rural ones. According to Focke (2004), only 6 per cent of the population in rural areas had access to a bank account, in contrast to a 15 per cent in urban areas. In this sense, the World Bank is currently (2004-2009) undertaking a project to develop the rural financial sector in Mexico since 74 per cent of the municipalities (hosting 22 per cent of the population) do not even have a bank branch in their territory[27]. Although the World Bank does not provide this information, these percentages are likely to refer to rural Mexico (22 per cent of the population in 2000-2004; see table 1). These numbers refer to the formal financial sector so that it would be possible for a developed informal financial sector to fill in these gaps. However, Paxton (2006) studies semi-formal financial institutions in rural Mexico and finds that they are highly inefficient. She calculates that the Mexican rural financial sector is 50 per cent less efficient than the

[26] A more traditional analysis based on a probit model of the emigration decision, available from the author upon request, did not confirm this hypothesis.

[27] Information available at the World Bank web page: www.worldbank.org. Web accessed on 10-20-2006.

urban one and attributes this difference to institutional factors rather than different client profiles.

Finally, a third hypothesis can be found by going back to the original meaning of the constructed asset index. The index reflects household infrastructure whose value could be notably higher in urban than in rural areas. In this sense, it would not be surprising that homes with the same amenities are more valuable and thus correspond to wealthier households in urban Mexico relative to rural Mexico. This would explain why individuals with the same asset index value could be constrained in rural areas but not in urban areas.

In addition to being significant, the relationship between wealth and the emigration probability is of a considerable magnitude. Taking into account that the average emigration rate out of rural Mexico is 1.31 per cent (table 5), figures 11 and 12 show that the effect of wealth on the emigration probability could be substantive. However, the fact that wealth is associated with the emigration probability in rural Mexico and not in urban Mexico does not say anything as to the ability of wealth constraints to explain the different selection patterns in both areas. In an additional stretch of DiNardo, Fortin, and Lemieux (1996) reweighing procedure, the McKenzie (2005) asset index can be included in the computation of counterfactual wage densities already undertaken in sections 3.2 and 4.2 (adding networks on the second case). This is an useful accounting exercise to see to what extent wealth constraints could be relevant in shaping the degree of selection. Figures 13 and 14 show the results.[28]

(Figure 13)

(Figure 14)

Figures 13 and 14 do not seem very different from figures 9 and 10. For the case of urban Mexico, the counterfactual wage density is basically identical to the one obtained when adding only the network variable. The percentage of the actual average degree of selection that observables (adding assets and networks) can explain is 65 per cent, only one additional percentage point to figures 9 and 10. Thus, 35 per cent of the observed degree of selection in urban Mexico is still attributable to negative selection on unobservable characteristics.

[28] See section 3.2 for an explanation of the computation of the wage counterfactual. The weights are calculated as in footnote 10 and adding the network variable, the McKenzie (2005) asset index, their interaction and the interactions of these two variables with the schooling categories. Results from the auxiliary logit regression are available from the author upon request.

Again, this situation is not surprising taking into account the above result that the asset index had no effect on the probability of emigration out of urban Mexico.

In the case of rural Mexico, consistent with the previous finding that the emigration probability increases on the wealth index for most of the rural population (suggestive of wealth constraints), adding the wealth measure to the counterfactual wage estimation has a more pronounced effect. As figures 13 and 14 show, now the counterfactual wage seems to be able to replicate the result obtained from using the actual wages in figures 4 and 5. In fact, looking at the averages of the counterfactual wage densities for rural Mexico in figure 13, the resulting degree of selection is 0.19, that is, 107 per cent of the actual degree of positive selection. The conclusion is that, once wealth constraints and network effects are taken into account, the positive selection result in rural Mexico can be completely accounted for. In addition, this shows that although positive selection prevails in rural Mexico in terms of observable characteristics, there is no significant selection on unobservables (the negative selection result is not statistically significant). Once networks and wealth constraints are considered, there is no need to keep trying to explain the positive selection result in rural Mexico but the existence of a significant degree of negative selection in unobservables in urban Mexico remains a matter for future research.

In any case, the value of these results depends critically on the quality of the chosen asset measure. All the results are similar when different household infrastructure indices are taken from the ENET, which provides some confidence about the robustness of the estimation. However, it would have been desirable to find an appropriate instrumental variable for the effect of wealth in the probability of migration so that causation in addition to correlation could have been tested and to avoid omitted variable bias, especially in the case of idiosyncratic network effects or the possibility of being a remittance recipient. Nevertheless, the inclusion of controls and fixed effects for time and location suggests that the estimation procedure can be solid enough and informative for the proposed question. A supplementary dataset other than the ENET would be needed to deepen the analysis presented here.

5 Conclusion

Immigration affects welfare in receiving and sending countries both through the size and the composition of migration flows, which is determined by how emigrants self-select. This paper explores three factors affecting selection, and thus the composition, of migration flows from Mexico to the United States in the period 2000-2004: wealth constraints, network effects and skill prices. There are two motivations for this. The first one is the need to explain why there are two very different patterns of selection inside Mexico: negative selection in urban Mexico (emigrants earn a lower wage and have less years of schooling than non-migrants) versus positive selection in rural Mexico (emigrants earn a higher wage and have more schooling years than non-migrants). The second motivation is that the effect of policy on the composition of migration flows will depend on the mechanisms that generate emigrant selection. For example, a more restrictive migration policy consisting of toughening border controls will generate a more positively selected migration flow when selection is negative to begin with but its effect is theoretically ambiguous when selection is positive to begin with.

Out of the three theories that could explain the differing selection patterns in rural and urban Mexico, all of them matter but they matter differently in different areas. First, higher skill prices in urban Mexico than in the United States account for most of the observable degree of negative selection in urban Mexico, where there seems to be no role either for network effects or for wealth constraints. However, higher skill prices in rural Mexico with respect to the United States, although relevant, are not enough to generate negative selection in rural Mexico as well. On the contrary, the low prevalence of network effects at the county level in rural Mexico helps to explain why selection is not more negative there. Still, positive selection survives the removal of skill prices and significant network effects. Wealth constraints must be added to be fully able to explain the positive selection result.

To sum up, the combination of the three factors is enough to account for the mechanism of selection observed in rural Mexico. What remains to be shown is why there is still negative selection in urban Mexico once the effect of all these variables is discounted.

By addressing the effect of wealth constraints on the migration decision, this paper also contributes to understanding the structure of migration costs. Semi-parametric techniques are used to estimate a non-linear function of the probability of emigration on wealth. The result is that there is no evidence of any effect of wealth constraints in urban Mexico but there is evidence that wealth constraints could be playing a role in the migration decision of individuals living in rural areas. This would lead to the conclusion that migration numbers would increase and the degree of selection would be more negative if the wealth constraints suffered by the rural population were reduced by better banking institutions or just by an improvement in their economic condition, ceteris paribus. In other words, negative selection characterized emigration from Mexico to the United States from 2000 to 2004 but it would have been even more negative if there were no wealth constraints in rural areas.

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A Data Appendix

Attrition rates in the ENET[29] are displayed in table A1. The average attrition rate is 11 per cent after one quarter. However, this is mostly due to the increase in the attrition rate happening in 2003, when the average is as high as 17 per cent. Still, as it is noted in the text, the main characteristics of the missing observations do not differ from the non-missing one in the first quarter in which they are all recorded.

(Table A1)

The ENET enumerates both individuals who will emigrate in the following quarter to the United States and those who claim to have returned from the United States to a household included in the sample. The total numbers by quarter can be observed in figure A1 with their corresponding 95 per cent confidence intervals.

(Figure A1)

The implied average emigration rate is 0.25 per cent of the population per quarter whereas the implied return migration is one third of this number. Both figures are surely an under-estimation since, as discussed in the text, the ENET does not gather information about

[29]Percentages are computed using survey weights. The results are basically identical without using them.

neither emigrants who leave nobody behind (migrating with their entire family) nor on return migrants who do not come back to an established household. If a US migrant returns and creates a new household, then it is not recorded as a return migrant. An additional problem in the dataset is the absence of migrants (their observations were deleted in the available file) from the first quarter of 2004.

Table A2 shows summary statistics for the ACS from 2000 to 2004 (used in the text) and its comparison with the values from the ACS itself for 2000 (which has only 244 observations) and the more reliable 2000 US Census.

(Table A2)

It can be seen that the picture that the ACS offers for recent Mexican immigrants in the US (arrived a year earlier) does not statistically differ from that offered by the 2000 US Census.

B Tables

Table 1:

Summary Statistics

Population aged 16 to 65		*Mexico*		*Urban Mexico*		*Rural Mexico*	
		Non-Migrants	*Emigrants*	*Non-Migrants*	*Emigrants*	*Non-Migrants*	*Emigrants*
Percent Male		47%	81%	47%	78%	47%	86%
		(0.0004)	(0.0056)	(0.0005)	(0.0081)	(0.0010)	(0.0074)
Males aged 16 to 65							
Age	Average	35.0	29.4	34.8	29.6	35.9	29.2
		(0.0175)	(0.1726)	(0.0194)	(0.2422)	(0.0397)	(0.2441)
	Median	33	27	33	27	34	27
Schooling years	Average	8.5	7.2	9.4	8.1	5.4	6.1
		(0.0060)	(0.0551)	(0.0066)	(0.0788)	(0.0106)	(0.0689)
	Median	9	6	9	9	6	6
Labor force participation		87%	89%	85%	87%	92%	91%
		(0.0004)	(0.0051)	(0.0005)	(0.0076)	(0.0007)	(0.0065)
Wage Earners		68%	60%	68%	61%	70%	58%
		(0.0006)	(0.0078)	(0.0007)	(0.0109)	(0.0013)	(0.0112)
Unemployment rate		1.8%	3.9%	2.1%	5.3%	0.8%	2.2%
		(0.0002)	(0.0036)	(0.0002)	(0.0058)	(0.0002)	(0.0033)
Hourly wage in 2006 dollars							
	Average	2.05	1.40	2.34	1.64	1.03	1.08
		(0.0039)	(0.0332)	(0.0048)	(0.0538)	(0.0041)	(0.0282)
	Median	1.43	1.14	1.62	1.28	0.80	0.95
Live in Rural Area		22%	45%				
		(0.0005)	(0.0079)				
Observations		4,252,646	12,649	3,764,680	9,150	487,966	3,499
Females aged 16 to 65							
Age	Average	35.3	28.2	35.2	29.0	35.3	26.5
		(0.0161)	(0.4083)	(0.0180)	(0.5381)	(0.0361)	(0.5575)
	Median	34	24	34	25	33	23
Schooling years	Average	7.9	8.5	8.7	9.1	5.0	7.1
		(0.0057)	(0.1412)	(0.0063)	(0.1890)	(0.0099)	(0.1787)
	Median	9	9	9	9	6	6
Labor force participation		42%	39%	45%	41%	32%	33%
		(0.0006)	(0.0160)	(0.0007)	(0.0199)	(0.0012)	(0.0270)
Wage Earners		28%	24%	31%	26%	17%	20%
		(0.0005)	(0.0137)	(0.0006)	(0.0169)	(0.0010)	(0.0237)
Unemployment rate		1.0%	2.0%	1.2%	2.4%	0.3%	1.1%
		(0.0001)	(0.0037)	(0.0002)	(0.0048)	(0.0001)	(0.0057)
Hourly wage in 2006 dollars							
	Average	1.92	1.49	2.06	1.74	1.06	0.86
		(0.0047)	(0.1027)	(0.0053)	(0.1359)	(0.0069)	(0.0624)
	Median	1.32	1.05	1.42	1.15	0.79	0.71
Live in Rural Area		22%	33%				
		(0.0005)	(0.0154)				

Source: ENET (2005). Standard errors in smaller font and in parentheses computed using the svy linearized option in Stata with the survery weights. 2000 only includes the last three quarters and 2004 only the first three quarters. The construction of wages follows the lines of Chiquiar and Hanson (2005). The ENET asks Mexicans for their wage in the previous week to that in which the survey is performed or, if the individual did not work that particular week, for the usual wage. The figure is then brought to the monthly level. In order to prevent wages to refer to different time periods, the observations for individuals who reported usual rather than actual wage income are dropped. I follow Chiquiar and Hanson (2005) in dropping observations of individuals who worked more than 84 hours or less than 20 hours per week. Finally, the observations for people who worked in the United States (mostly border workers) are also dropped. Real wages are constructed with inflation data from the INPC series, Mexican CPI, in Banxico (www.banxico.org.mx), the Mexican central bank. These are quarterly averages based on June 2002 and brought to December 2005 with an index of 116.301. The exchange rate, from the International Financial Statistics of the IMF, corresponds to the 1 January 2006 and it is 10.7777 pesos per dollar. Following Chiquiar and Hanson (2005), hourly wages are computed by dividing the monthly wage income reported in the ENET by 4.5 times the number of hours worked in the previous week. Individuals are considered to live in a rural area when their locality has less than 2,500 inhabitants according to the 2000 Mexican Census.

Table 2:

Mincer Regressions: Mexican males aged 16 to 65 (2000-2004)

Dependent variable: Log of the hourly wage	*Urban Mexico*		*Rural Mexico*		*US*
	All	*Migrants*	*All*	*Migrants*	*Migrants*
Schooling Years	**0.0929**	**0.0630**	**0.0853**	**0.0374**	**0.0320**
	(0.0003)	**(0.0079)**	**(0.0009)**	**(0.0122)**	**(0.0065)**
Experience	**0.0324**	**0.0199**	**0.0031**	**-0.0173**	**0.0155**
	(0.0002)	**(0.0059)**	**(0.0007)**	**(0.0078)**	**(0.0057)**
$Experience^2$	**-0.0005**	-0.0003	**-0.0002**	0.0002	-0.0000
	(0.0000)	(0.0002)	**(0.0000)**	(0.0002)	(0.0001)
Constant	**-0.6885**	**-0.4491**	**-0.8067**	**-0.2736**	**1.6075**
	(0.0035)	**(0.0873)**	**(0.0109)**	**(0.1252)**	**(0.0782)**
Observations	1,789,715	4,297	243,295	1,651	1,264
R^2	0.27	0.08	0.13	0.05	0.05

Source: ENET (2005) for urban and rural Mexico and ACS for Mexican immigrants in the United States arrived a year earlier. Standard errors in smaller font and in parentheses. Coefficients in bold if significant at a 95 per cent confidence level. Experience is computed as age – 16 – (schooling years – 9).

Table 3:

Summary Statistics (2000-2004)

		Urban Mexico				*Rural Mexico*			
Individuals aged 16 to 65		*High Network Prevalence*		*Low Network Prevalence*		*High Network Prevalence*		*Low Network Prevalence*	
		Non-Migrants	*Emigrants*	*Non-Migrants*	*Emigrants*	*Non-Migrants*	*Emigrants*	*Non-Migrants*	*Emigrants*
Percent Male		47%	77%	46%	81%	47%	84%	47%	87%
		(0.0006)	(0.0100)	(0.0010)	(0.0132)	(0.0013)	(0.0103)	(0.0013)	(0.0107)
Males									
Age	*Average*	34.8	29.5	34.8	29.7	36.3	29.5	35.7	29.0
		(0.0225)	(0.2928)	(0.0379)	(0.4305)	(0.0558)	(0.3306)	(0.0557)	(0.3567)
	Median	33	27	33	28	35	27	34	26
Schooling years	*Average*	9.6	8.3	8.6	7.6	5.5	6.3	5.3	5.9
		(0.0075)	(0.0962)	(0.0132)	(0.1358)	(0.0151)	(0.0877)	(0.0147)	(0.1048)
	Median	9	9	9	8	6	6	6	6
Labor force participation		85%	86%	86%	89%	92%	90%	92%	92%
		(0.0006)	(0.0094)	(0.0010)	(0.0128)	(0.0010)	(0.0089)	(0.0010)	(0.0093)
Wage Earners		67%	60%	70%	65%	69%	53%	70%	62%
		(0.0008)	(0.0131)	(0.0013)	(0.0191)	(0.0018)	(0.0150)	(0.0018)	(0.0163)
Unemployment rate		2.2%	5.3%	1.8%	5.3%	0.8%	2.5%	0.7%	2.0%
		(0.0003)	(0.0071)	(0.0004)	(0.0100)	(0.0004)	(0.0049)	(0.0003)	(0.0046)
Hourly wage in 2006 dollars									
	Average	2.48	1.72	1.93	1.47	1.12	1.09	0.97	1.07
		(0.0059)	(0.0701)	(0.0068)	(0.0771)	(0.0055)	(0.0339)	(0.0058)	(0.0430)
	Median	1.71	1.33	1.36	1.16	0.90	0.99	0.73	0.91
Network prevalence		44%	41%	17%	17%	37%	35%	12%	17%
		(0.0002)	(0.0038)	(0.0002)	(0.0020)	(0.0004)	(0.0024)	(0.0002)	(0.0018)
Observations		2,725,285	6,484	1,039,395	2,666	273,502	2,178	214,464	1,321

Source: ENET (2005). See table 1 for details. The network prevalence variable is built as the percentage of individuals older than 15 that have ever migrated in a municipality according to the ENADID 1997.

Table 4:

Asset Index Construction (ENET 2000-2004)

	Scoring factors				Means by tercile of asset indicator					
					McKenzie (2005)			All ENET		
Characteristics	McKenzie (2005)	All ENET	Mean	Standard Deviation	Lowest	Middle	Upper	Lowest	Middle	Upper
Home owner	-0.05	-0.02	0.70	0.46	0.76	0.64	0.68	0.73	0.69	0.66
Number of rooms	0.30	0.29	3.87	1.71	2.71	3.58	5.32	2.54	3.74	5.32
Bathroom	0.23	0.24	0.88	0.33	0.69	0.94	0.98	0.65	0.99	0.98
Adobe walls	-0.21	-0.15	0.08	0.28	0.24	0.02	0.00	0.22	0.03	0.00
Brick walls	0.33	0.27	0.83	0.38	0.51	0.97	0.98	0.52	0.96	0.98
Cardboard or asbestos roof	-0.32		0.24	0.42	0.66	0.05	0.00	0.60	0.10	0.00
Brick roof	0.36	0.30	0.69	0.46	0.18	0.89	0.97	0.23	0.84	0.97
Dirt floor	-0.29	-0.23	0.10	0.29	0.28	0.00	0.00	0.28	0.01	0.00
Wood floor	0.30	0.27	0.38	0.48	0.03	0.25	0.83	0.03	0.23	0.85
Electricity	0.17	0.13	0.98	0.15	0.93	1.00	1.00	0.93	1.00	1.00
Water	0.24	0.19	0.91	0.29	0.75	0.97	1.00	0.75	0.97	1.00
Sewerage	0.30	0.25	0.83	0.38	0.55	0.93	1.00	0.55	0.93	1.00
Phone	0.30	0.26	0.38	0.49	0.05	0.22	0.87	0.05	0.27	0.82
Other utilities	0.19	0.16	0.15	0.36	0.03	0.04	0.38	0.03	0.06	0.37
Loft		0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Communal appartment		-0.08	0.06	0.24	0.09	0.08	0.01	0.13	0.04	0.01
Appartment Building		0.11	0.11	0.32	0.02	0.13	0.19	0.02	0.10	0.22
House		-0.04	0.83	0.38	0.89	0.80	0.78	0.85	0.86	0.75
Lent house		-0.05	0.09	0.29	0.12	0.11	0.05	0.13	0.10	0.04
Rented house		0.03	0.12	0.33	0.08	0.18	0.11	0.09	0.14	0.13
Not full ownership		0.06	0.09	0.28	0.04	0.08	0.14	0.04	0.07	0.15
Kitchen		0.17	0.84	0.37	0.71	0.84	0.97	0.66	0.87	0.98
Number of bedrooms		0.26	1.99	1.15	1.34	1.89	2.70	1.21	1.97	2.74
No bathroom		-0.22	0.08	0.27	0.23	0.01	0.00	0.23	0.00	0.00
Collective bathroom		-0.09	0.04	0.21	0.08	0.05	0.00	0.12	0.01	0.00
Cardboard walls		-0.05	0.00	0.06	0.01	0.00	0.00	0.01	0.00	0.00
Metal or asbestos walls		-0.05	0.01	0.07	0.02	0.00	0.00	0.02	0.00	0.00
Wooden walls		-0.20	0.07	0.26	0.21	0.01	0.00	0.21	0.00	0.00
Cardboard roof		-0.14	0.04	0.19	0.11	0.00	0.00	0.11	0.00	0.00
Asbestos roof		-0.21	0.20	0.40	0.55	0.04	0.00	0.49	0.10	0.00
Wooden roof		-0.11	0.07	0.25	0.14	0.06	0.01	0.15	0.05	0.01
Cement floor		-0.13	0.53	0.50	0.69	0.75	0.15	0.69	0.77	0.13
House older than 20 years		0.05	0.32	0.47	0.29	0.28	0.37	0.28	0.29	0.38
House 10 to 20 years		0.04	0.33	0.47	0.29	0.34	0.36	0.28	0.34	0.38
House 5 to 10 years		-0.04	0.20	0.40	0.22	0.22	0.16	0.23	0.22	0.15
House 1 to 5 years		-0.07	0.11	0.31	0.16	0.12	0.06	0.17	0.12	0.05
House less than 1 year		-0.02	0.01	0.09	0.01	0.01	0.01	0.01	0.01	0.00
McKenzie (2005) Asset Index			0	2.09	-2.51	0.50	2.01	-2.45	0.46	1.99
All ENET Asset Index			0	2.37	-2.74	0.41	2.33	-2.81	0.45	2.36
Observations:	2,760,359	2,760,359								
Eigenvalue for first component	4.3873	5.6388								
Share of variance	0.3134	0.1566								

Source: ENET (2005). Observations from the second quarter for the period 2000-2004. Principal components analysis and construction of a household wealth index.

Table 5:

Summary Statistics

Mexican Men aged 16 to 65 years old	All Mexico		Rural Mexico		Urban Mexico	
	Mean or Proportion	Standard Deviation	Mean or Proportion	Standard Deviation	Mean or Proportion	Standard Deviation
Emigrant the following quarter	0.0065	0.0003	0.0131	0.0008	0.0048	0.0002
Household Asset Index (McKenzie, 2005)	0.1384	0.0063	-1.9981	0.0142	0.6757	0.0055
Log hourly wage	0.3518	0.0029	-0.4219	0.0078	0.5464	0.0027
Schooling years	8.3667	0.0145	5.0643	0.0263	9.1972	0.0155
Age	36.1455	0.0376	37.7854	0.0925	35.7331	0.0408
Network prevalence (ENADID 1997)	0.3313	0.0006	0.2039	0.0009	0.3634	0.0006
Metropolitan Area	0.3685	0.0015	0.0170	0.0007	0.4569	0.0017
Rural Area	0.2009	0.0013	1.0000	0.0000	0.0000	0.0000
Distance to the border (km.)	661.5893	0.7580	748.0348	1.6465	639.8514	0.8416
Married	0.7250	0.0014	0.7659	0.0030	0.7147	0.0015
Household Size	4.9706	0.0067	5.4614	0.0175	4.8472	0.0071
Household head	0.6830	0.0014	0.7172	0.0032	0.6744	0.0016
Spouse	0.0114	0.0003	0.0105	0.0007	0.0116	0.0004
Offspring	0.2402	0.0013	0.2258	0.0029	0.2439	0.0015
Other household members	0.0654	0.0007	0.0465	0.0014	0.0701	0.0009
Quarters:						
2-2000	0.2357	0.0013	0.2856	0.0031	0.2232	0.0014
2-2001	0.1975	0.0012	0.1935	0.0028	0.1986	0.0013
2-2002	0.2232	0.0013	0.2326	0.0030	0.2208	0.0014
2-2003	0.1837	0.0012	0.1797	0.0028	0.1847	0.0014
2-2004	0.1598	0.0012	0.1085	0.0020	0.1727	0.0014
States:						
Aguascalientes	0.0092	0.0001	0.0081	0.0002	0.0095	0.0001
Baja California	0.0334	0.0004	0.0141	0.0005	0.0383	0.0004
Baja California Sur	0.0057	0.0001	0.0055	0.0002	0.0057	0.0001
Campeche	0.0085	0.0001	0.0103	0.0003	0.0080	0.0001
Coahuila	0.0268	0.0003	0.0097	0.0004	0.0311	0.0004
Colima	0.0060	0.0001	0.0041	0.0001	0.0065	0.0001
Chiapas	0.0352	0.0006	0.0806	0.0023	0.0237	0.0005
Chihuahua	0.0337	0.0005	0.0194	0.0007	0.0374	0.0006
Distrito Federal	0.0944	0.0011	0.0010	0.0001	0.1179	0.0013
Durango	0.0149	0.0002	0.0208	0.0006	0.0135	0.0002
Guanajuato	0.0472	0.0006	0.0626	0.0019	0.0433	0.0005
Guerrero	0.0285	0.0004	0.0540	0.0014	0.0221	0.0004
Hidalgo	0.0201	0.0005	0.0434	0.0011	0.0143	0.0005
Jalisco	0.0548	0.0007	0.0311	0.0014	0.0608	0.0008
México	0.1464	0.0014	0.0797	0.0022	0.1632	0.0016
Michoacán	0.0342	0.0007	0.0536	0.0017	0.0293	0.0007
Morelos	0.0146	0.0002	0.0098	0.0004	0.0158	0.0003
Nayarit	0.0085	0.0001	0.0137	0.0004	0.0071	0.0001
Nuevo León	0.0494	0.0005	0.0107	0.0004	0.0592	0.0006
Oaxaca	0.0290	0.0005	0.0692	0.0019	0.0189	0.0004
Puebla	0.0472	0.0006	0.0527	0.0018	0.0459	0.0006
Querétaro	0.0143	0.0002	0.0208	0.0006	0.0126	0.0002
Quintana Roo	0.0122	0.0002	0.0090	0.0003	0.0131	0.0002
San Luis Potosí	0.0213	0.0003	0.0341	0.0010	0.0181	0.0003
Sinaloa	0.0257	0.0004	0.0313	0.0010	0.0243	0.0004
Sonora	0.0229	0.0004	0.0160	0.0006	0.0246	0.0004
Tabasco	0.0237	0.0003	0.0525	0.0011	0.0165	0.0003
Tamaulipas	0.0271	0.0003	0.0166	0.0007	0.0297	0.0004
Tlaxcala	0.0102	0.0001	0.0107	0.0003	0.0100	0.0002
Veracruz	0.0660	0.0010	0.1252	0.0031	0.0511	0.0010
Yucatán	0.0197	0.0002	0.0162	0.0005	0.0206	0.0003
Zacatecas	0.0090	0.0002	0.0134	0.0005	0.0079	0.0002
Observations	355,469		37,047		318,422	

Source: ENET (2005) and ENADID 1997 for the network variable. Distance to the border calculated with data from the Center for International Earth Science Information Network (CIESIN), Columbia University, 2000. US-Mexico DDViewer, 3.1. Palisades, NY: CIESIN, Columbia University. Available at: http://plue.sedac.ciesin.org/plue/ddviewer/ddv30-USMEX/.

C Figures

Figure 1:

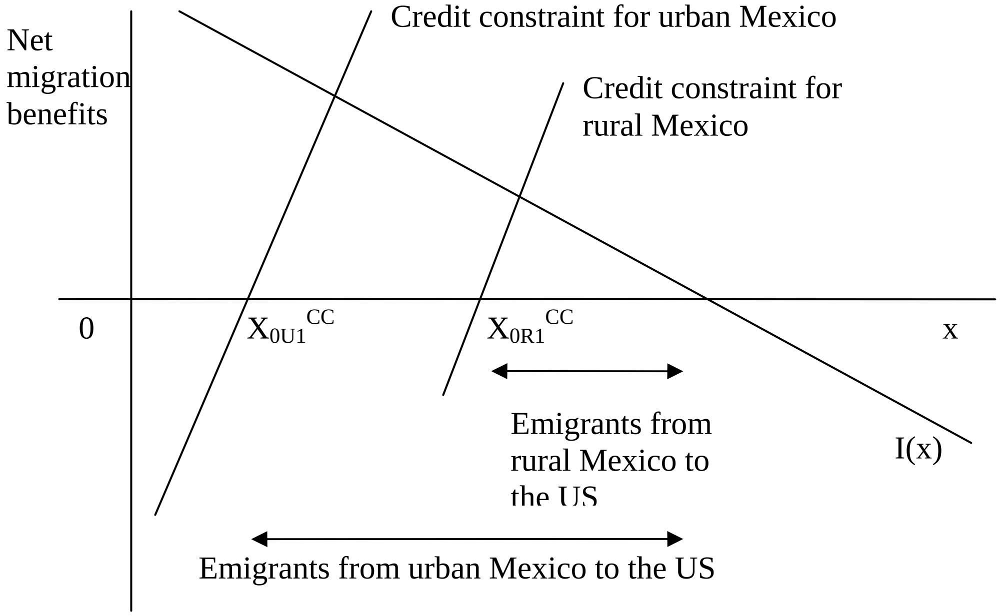
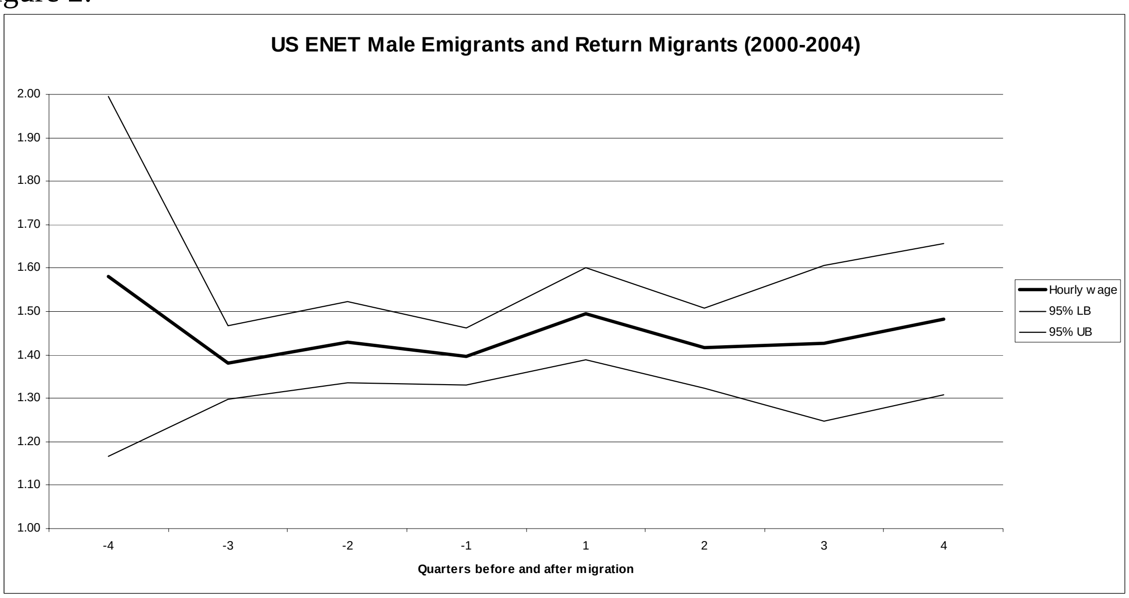
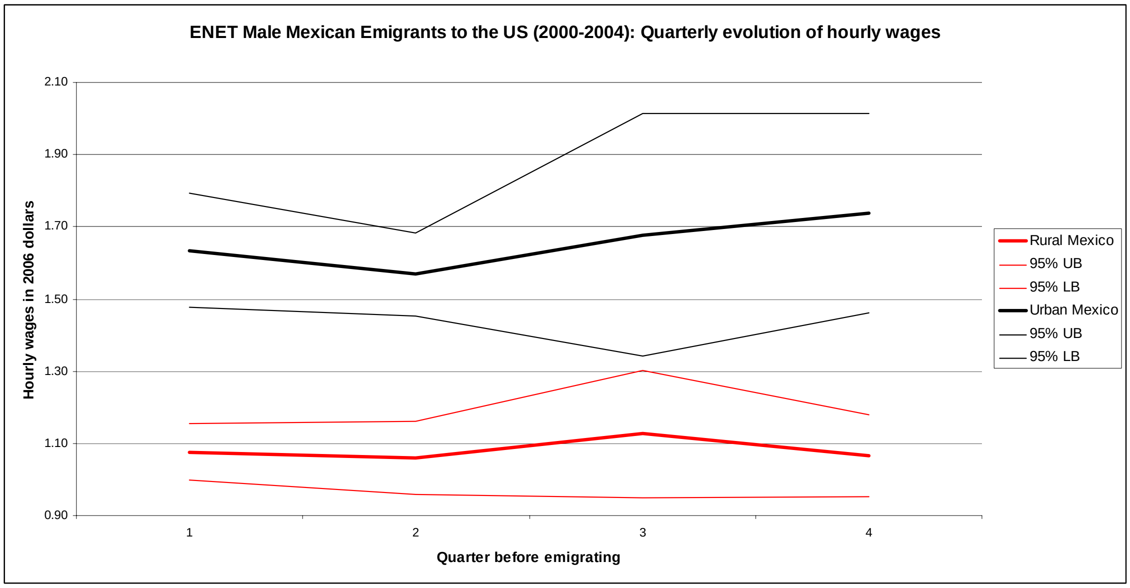


Figure 2:



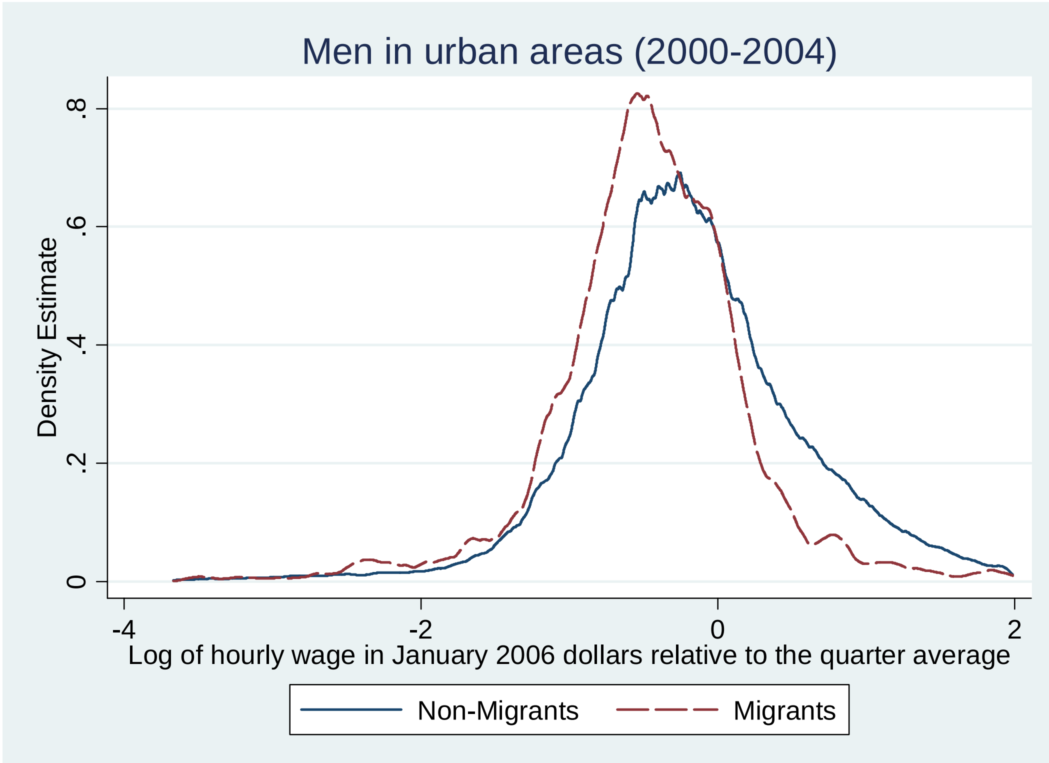
Source: ENET (2005). Construction of wages follows the procedure explained in Table 1.

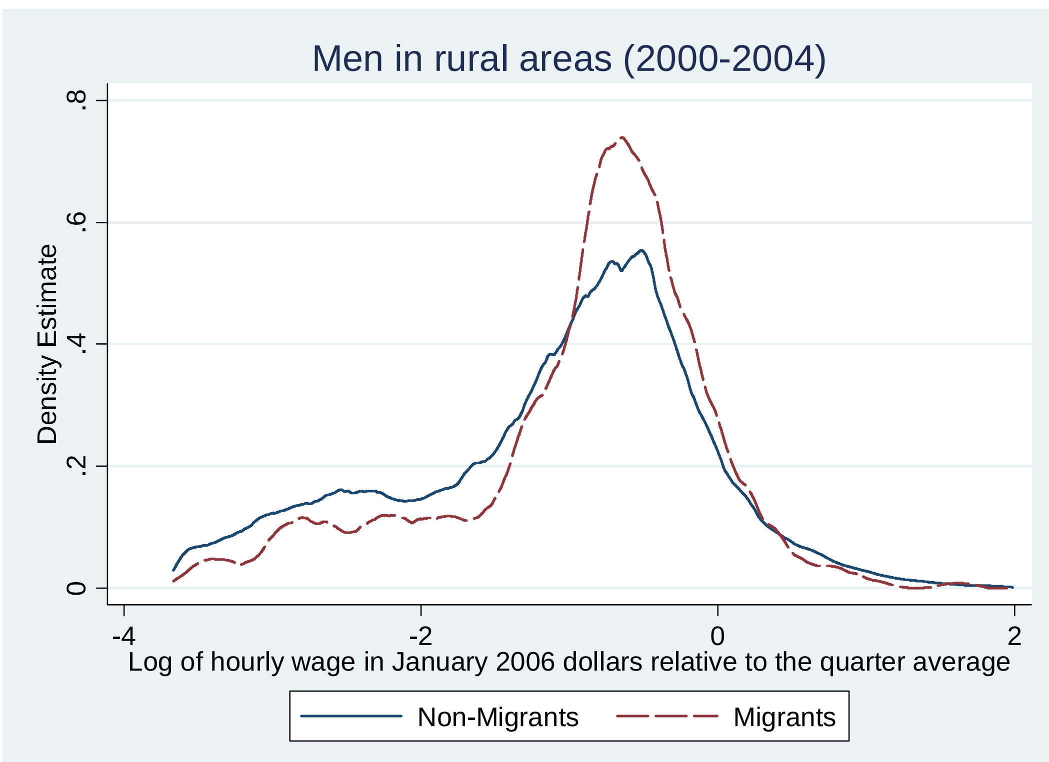
Figure 3:



Source: ENET (2005). Construction of wages follows the procedure explained in Table 1. Quarters refer to the quarter in which the wage observation was recorded.

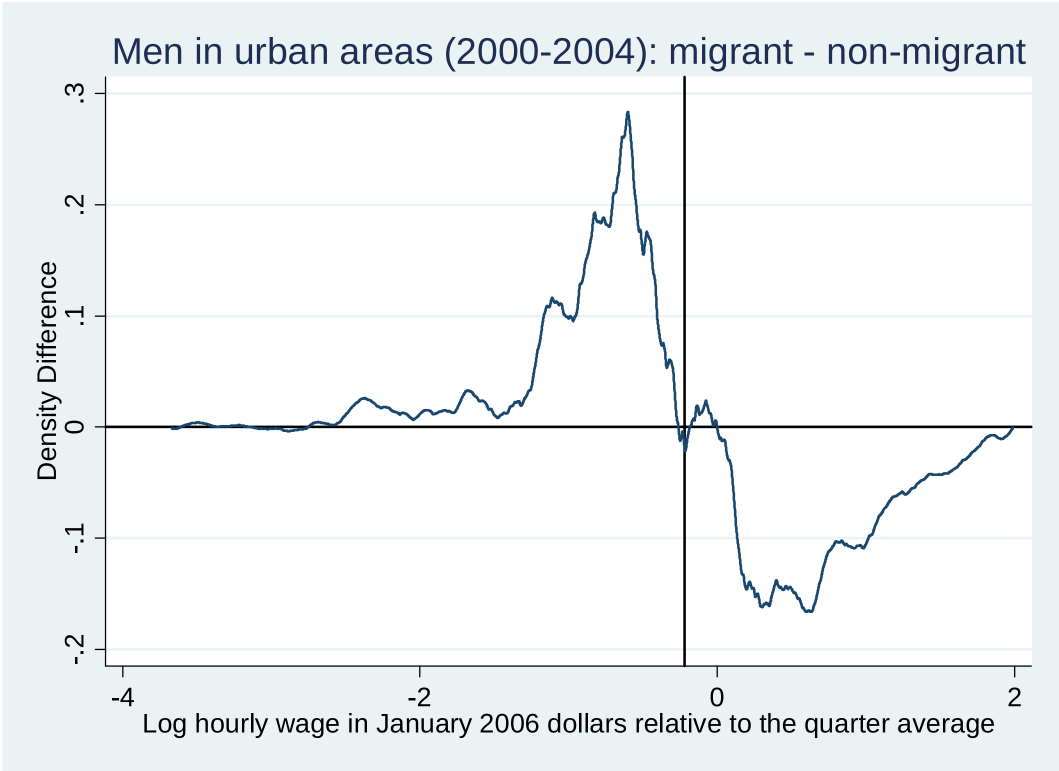
Figure 4:

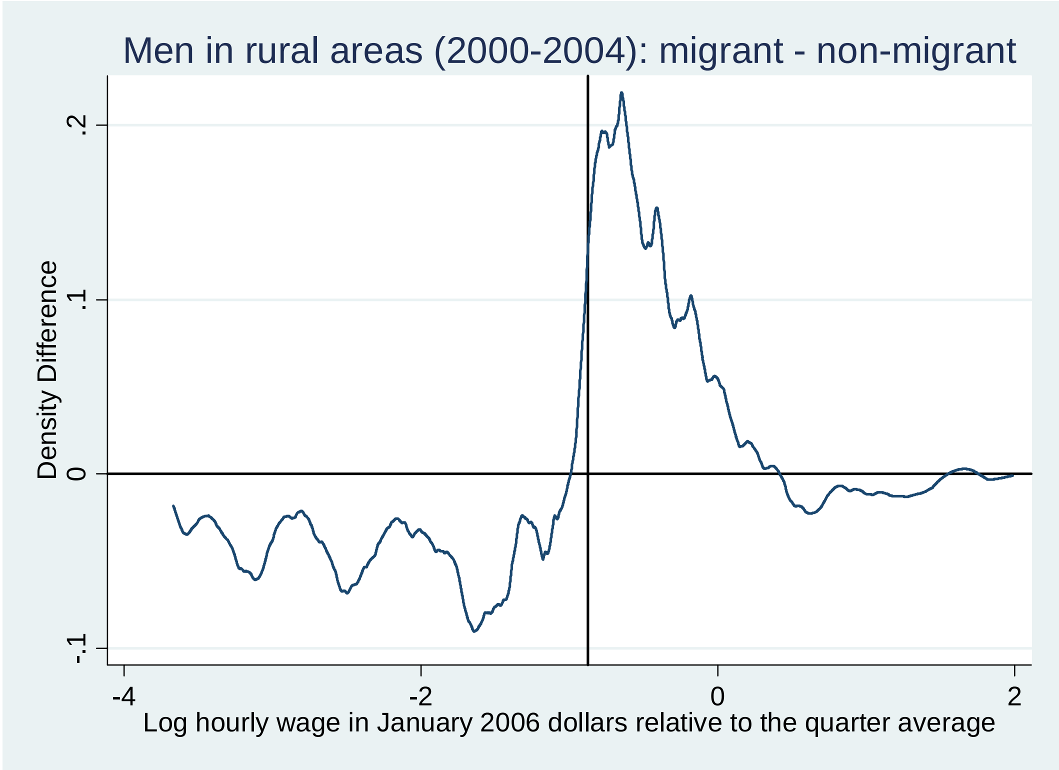




Source: ENET (2005). Log of the hourly wage relative to the quarter average. See table 1 for the construction of wages. For the estimation of the kernel densities, I use an Epanechnikov kernel (Silverman (1986)). To prevent over-smoothing, I follow Leibbrandt, Levinsohn, and McCrary (2005) in using a bandwidth which is .75 times the optimal. I follow Chiquiar and Hanson (2005) in dropping the highest and lowest 0.5 percent of observations to eliminate outliers.

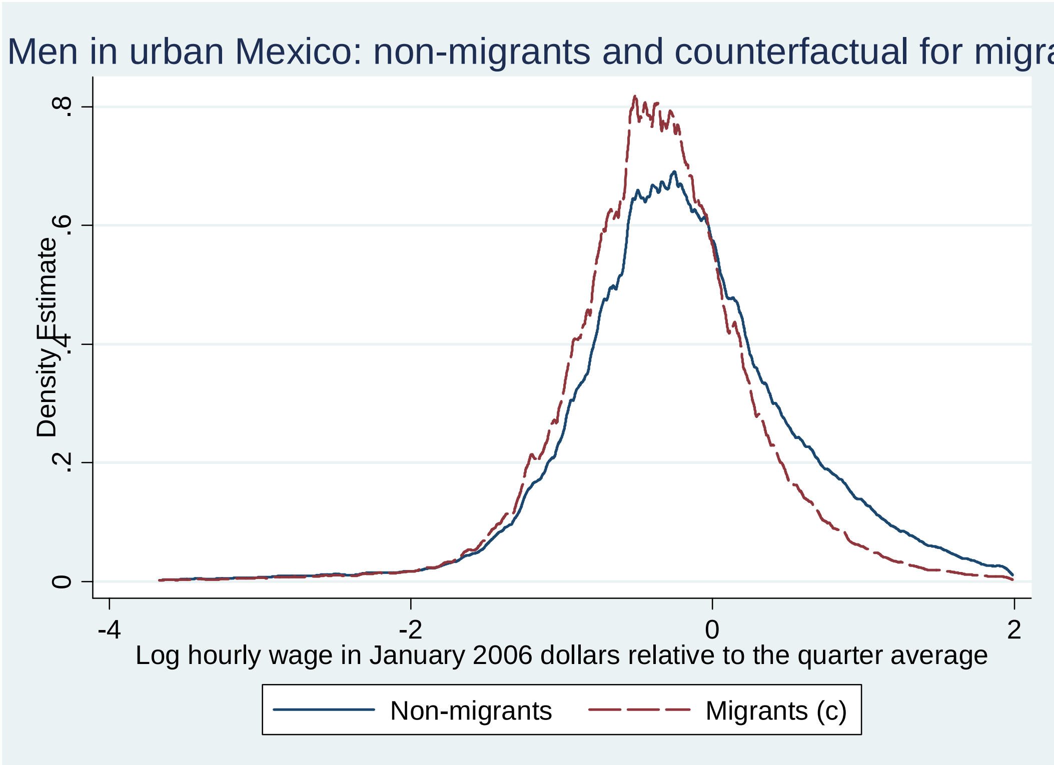
Figure 5:

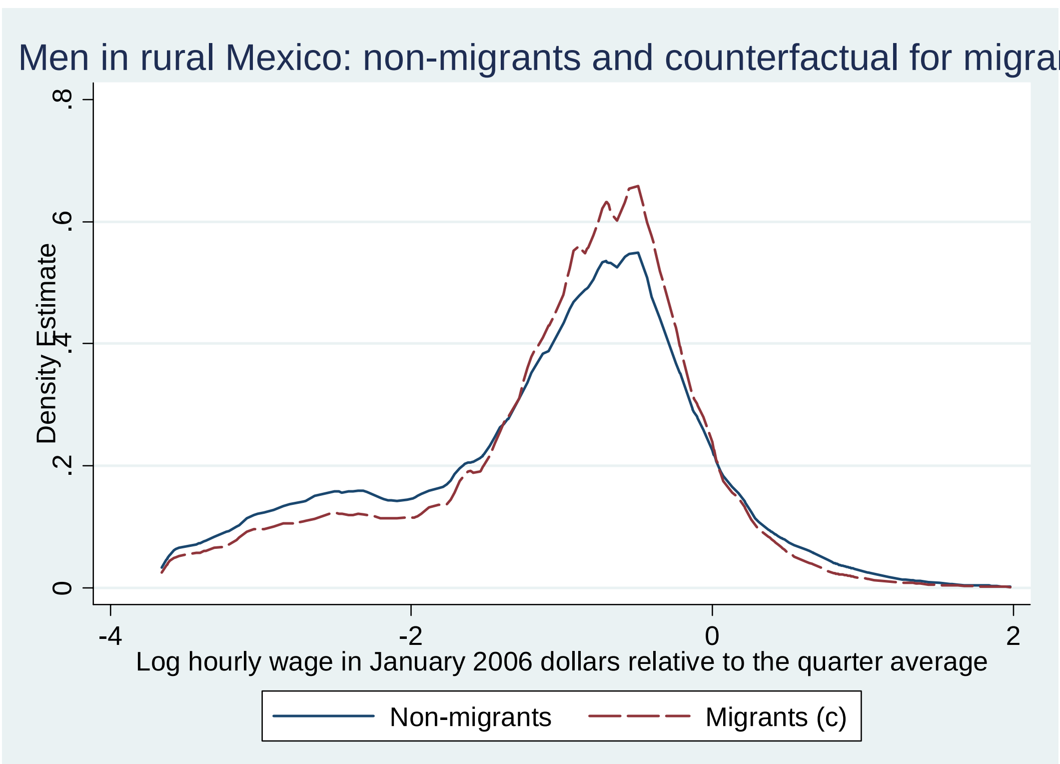




Source: ENET (2005). Migrant minus non-migrant wage densities computed in figure 4. See figure 4 for an explanation. The solid black vertical line represents the median of the log of the relative wage distribution.

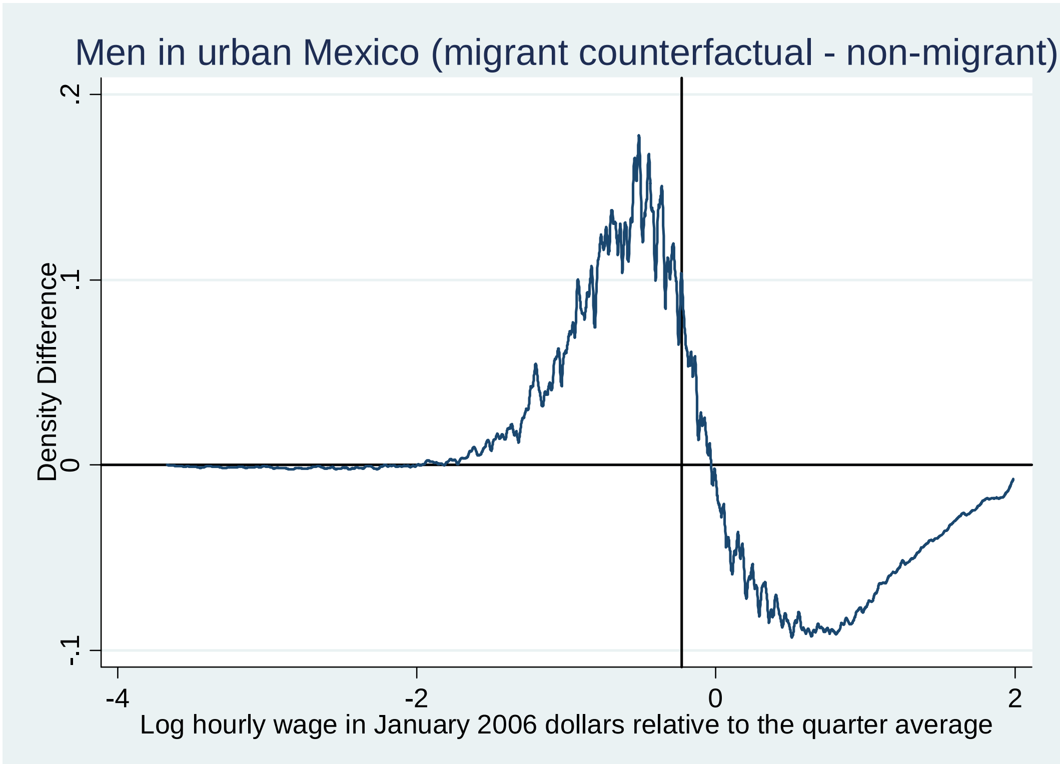
Figure 6:

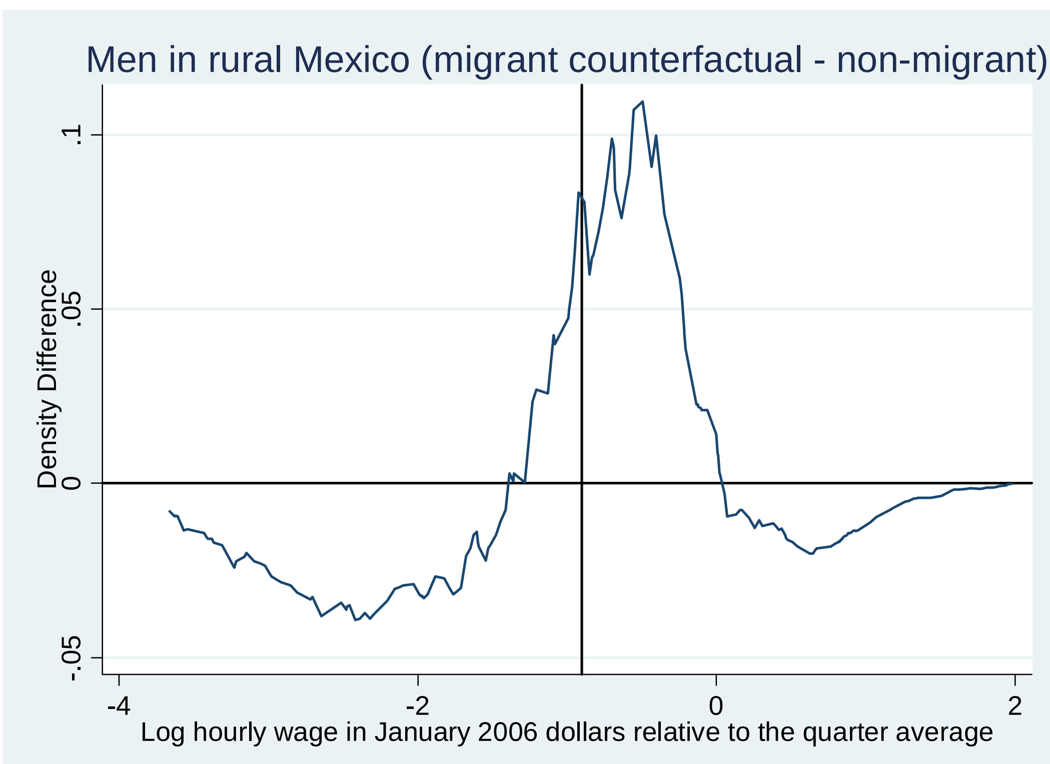




Source: ENET (2005). The counterfactual (emigrant wages based only on their observable characteristics) is estimated following DiNardo, Fortin and Lemieux (1996).

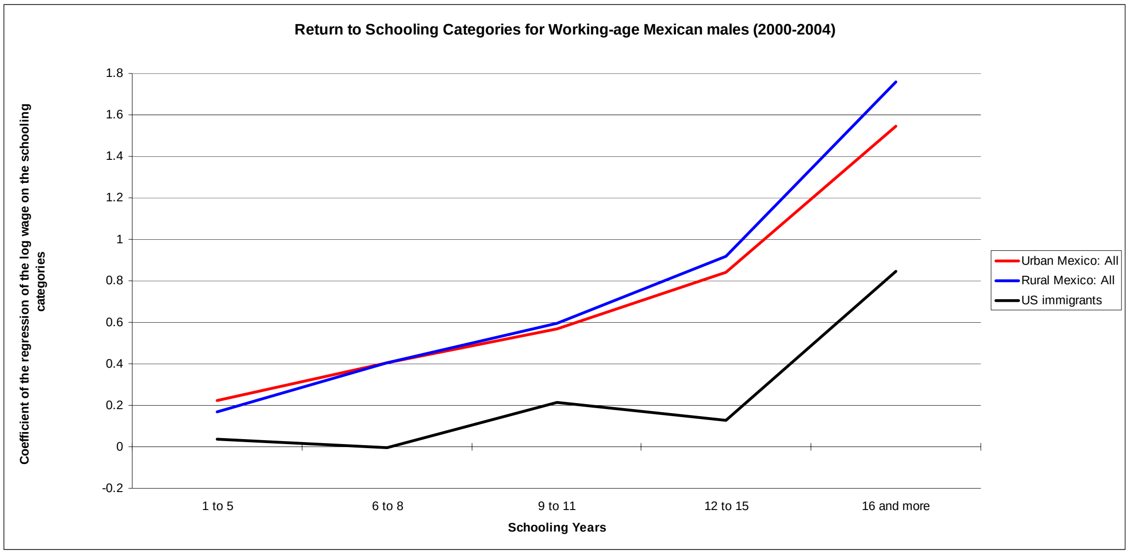
Figure 7:

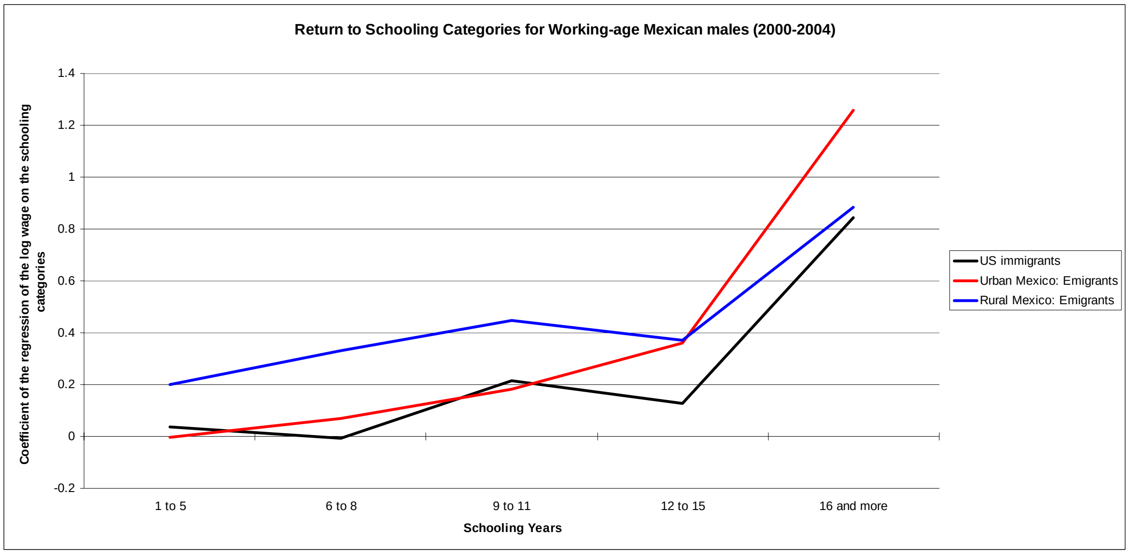




Source: ENET (2005). Counterfactual migrant wage density minus actual non-migrant wage density computed in figure 6. See figure 6 for an explanation. The solid black vertical line represents the median of the log of the relative wage distribution.

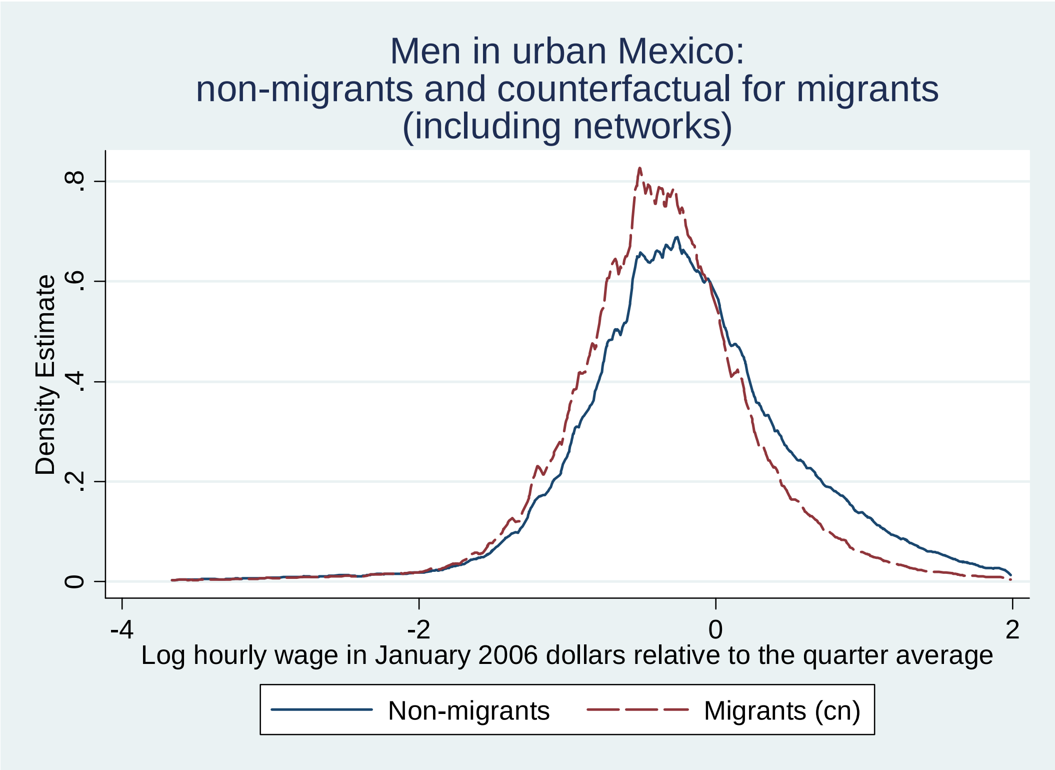
Figure 8:

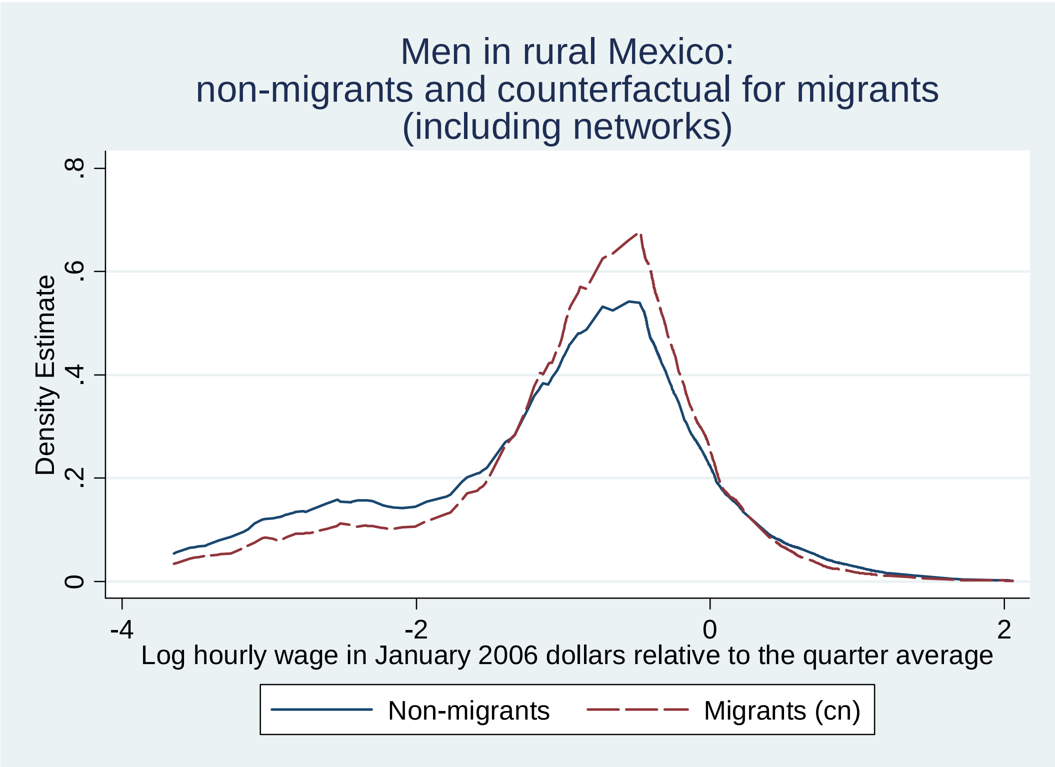




Source: ENET (2005) for urban and rural Mexico and ACS for Mexican immigrants to the US. The figure represents the coefficients from the same regressions as in table 2 but this time substituting the schooling years variable for schooling category dummies, where 0 years of schooling is the excluded category.

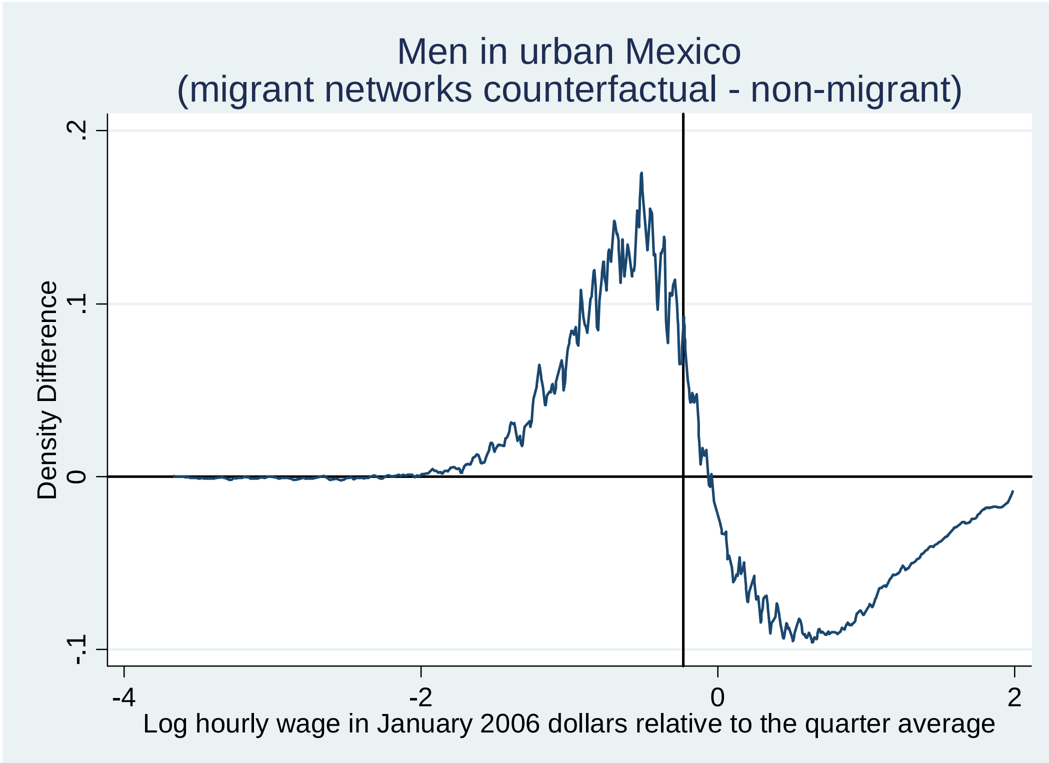
Figure 9:

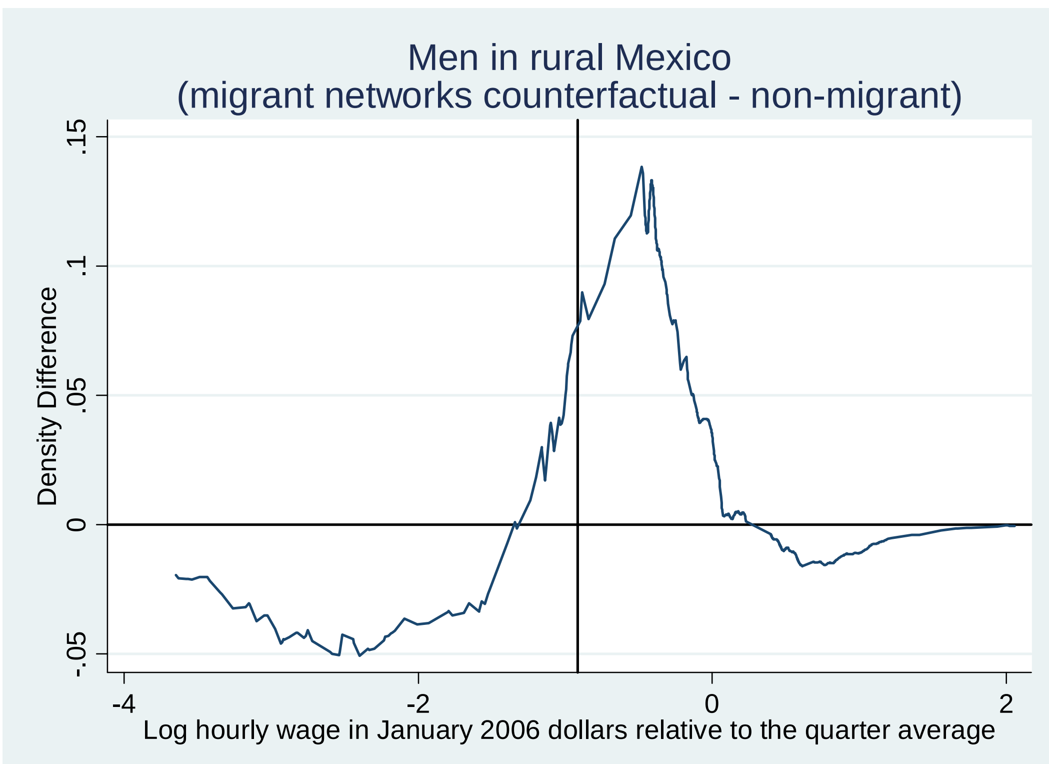




Source: ENET (2005). See figure 6 for an explanation. The calculation of the counterfactual includes the network variable and its interaction with schooling groups.

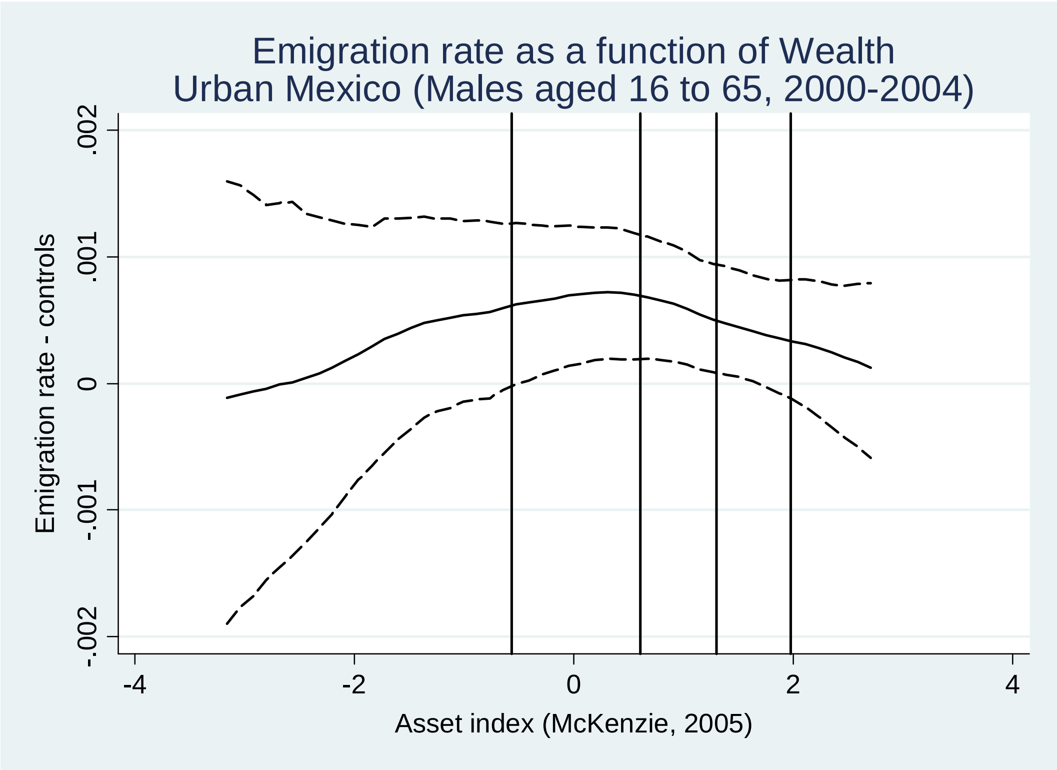
Figure 10:

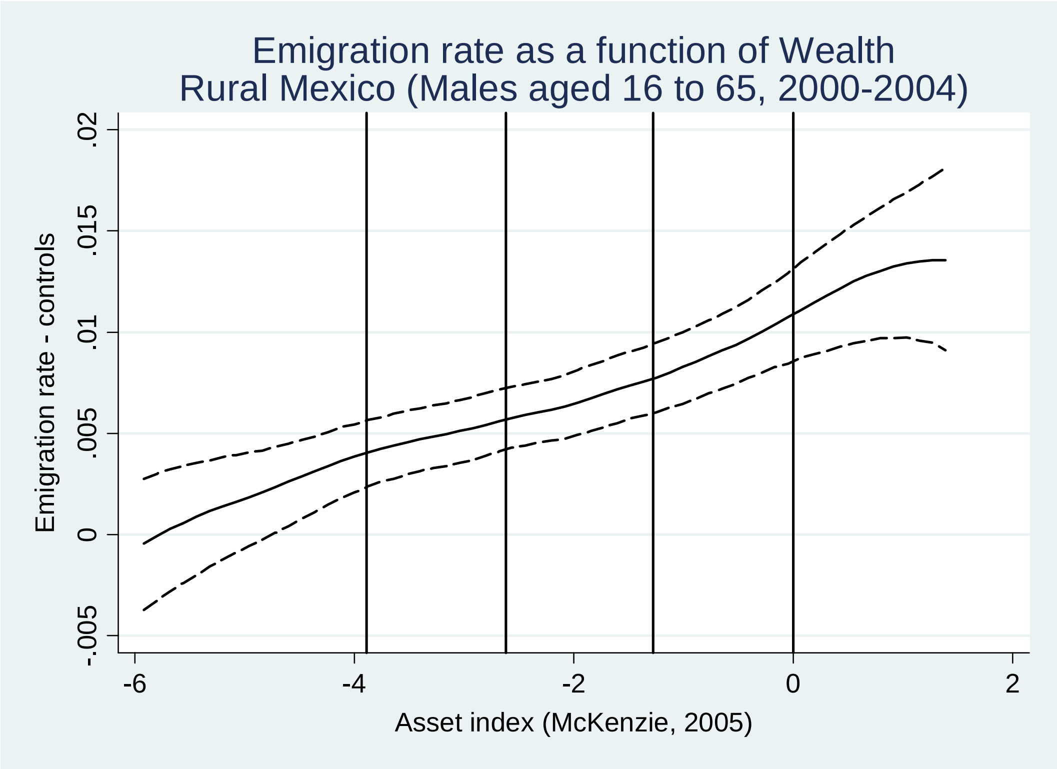




Source: ENET (2005). Counterfactual migrant wage density minus actual non-migrant wage density computed in figure 9. See figure 9 for an explanation. The solid black vertical line represents the median of the log of the relative wage distribution.

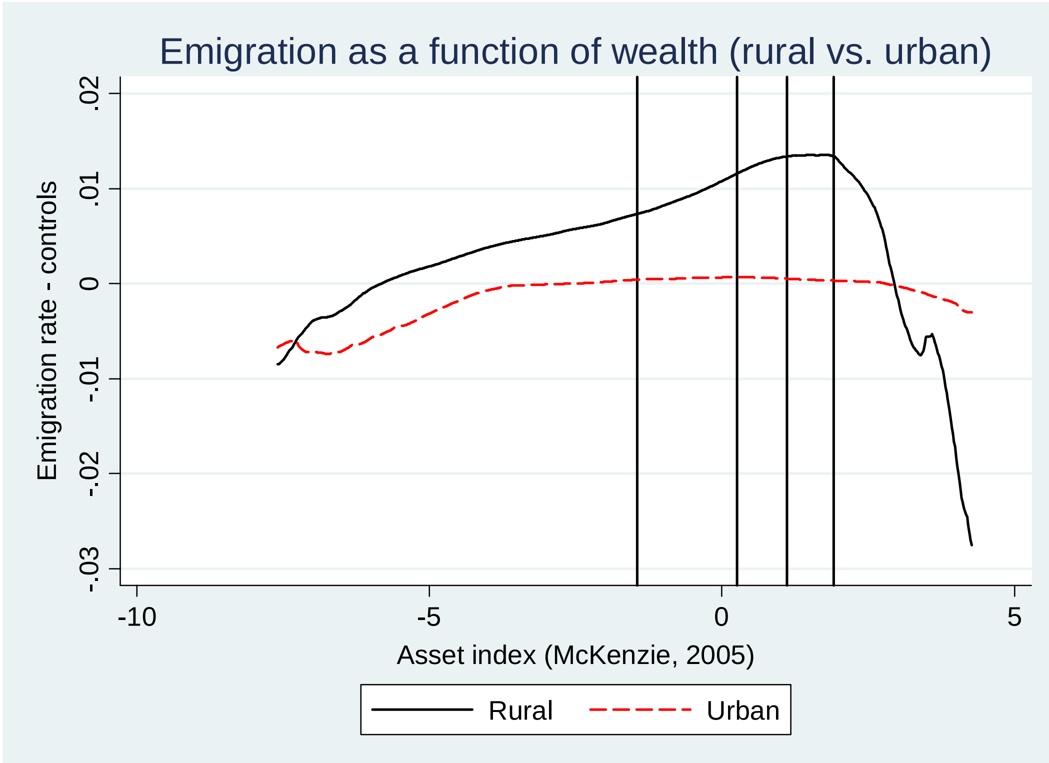
Figure 11:





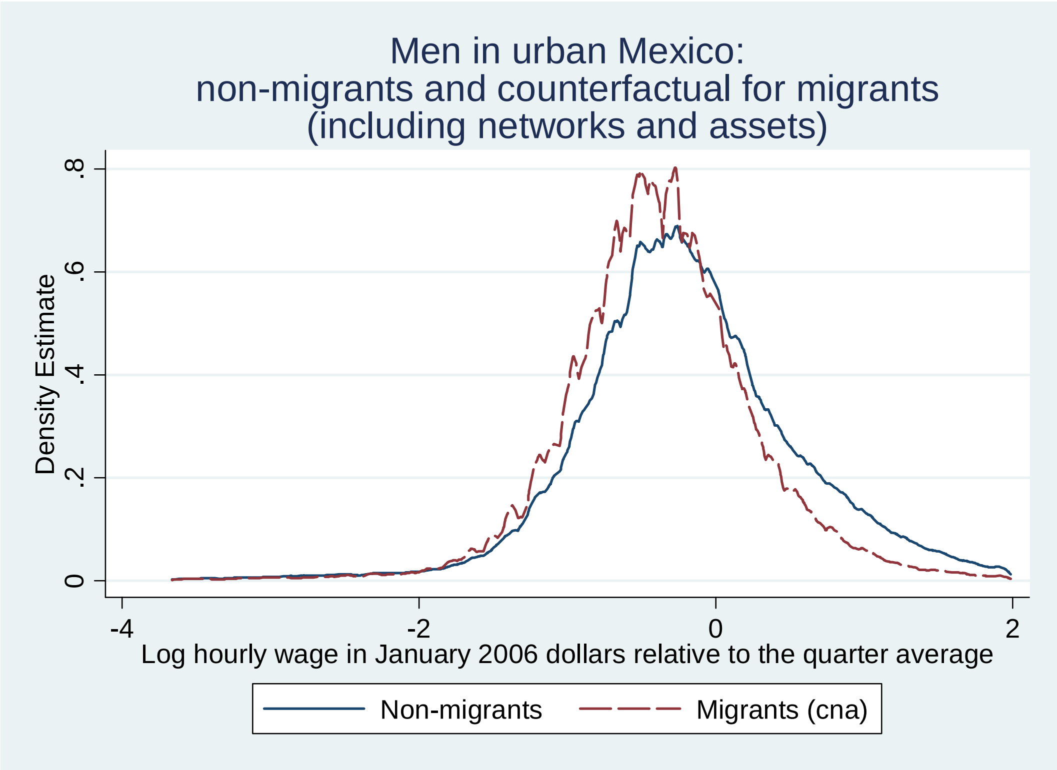
Source: Fan (1992) local linear regression of the emigration rate net of other controls (see table 5 and text) on the McKenzie (2005) version of the asset index (see table 4). The dotted lines represent the 90 per cent confidence interval obtained from bootstrapping the procedure 1000 times by randomly sampling with replacement half of the observations. The vertical solid lines represent the position of wealth quintiles in urban and rural Mexico. Following Deaton (1997), the Epanechnikov kernel is used. A bandwidth of 0.2 times the asset index range is chosen. Although it is used for the calculations, the representation drops 2.5 per cent of the highest and lowest asset values.

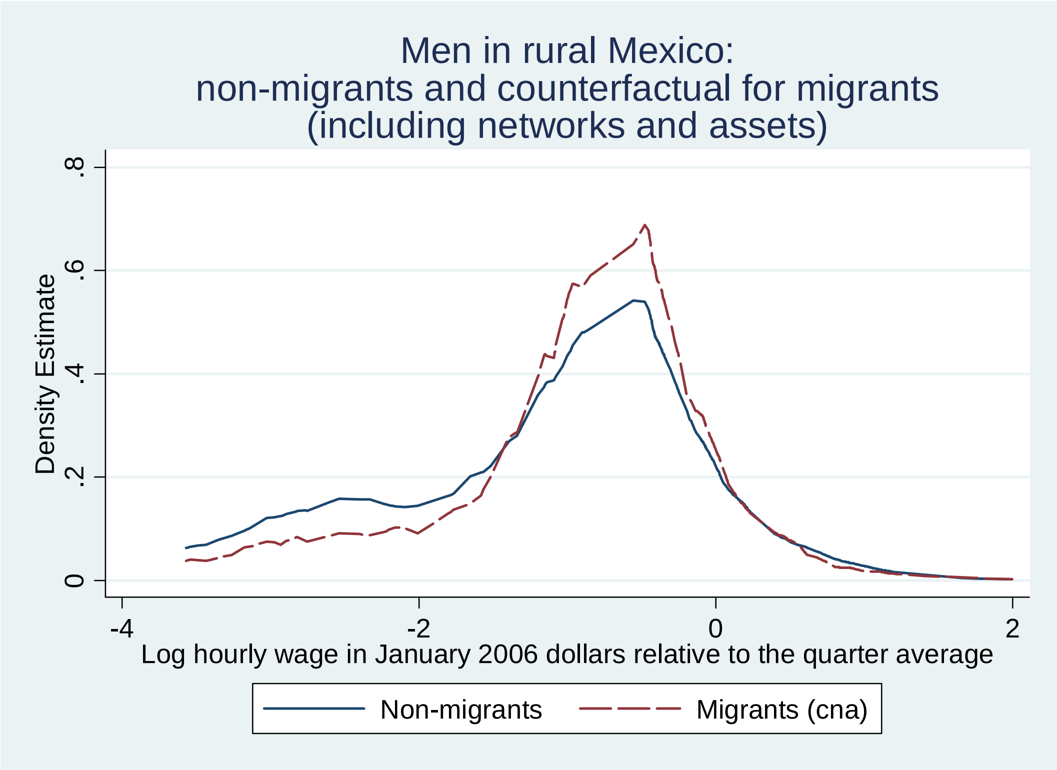
Figure 12:



Source: See figure 11. No asset values are dropped in this representation. The solid vertical lines represent the situation of the wealth quintiles for Mexico as a whole.

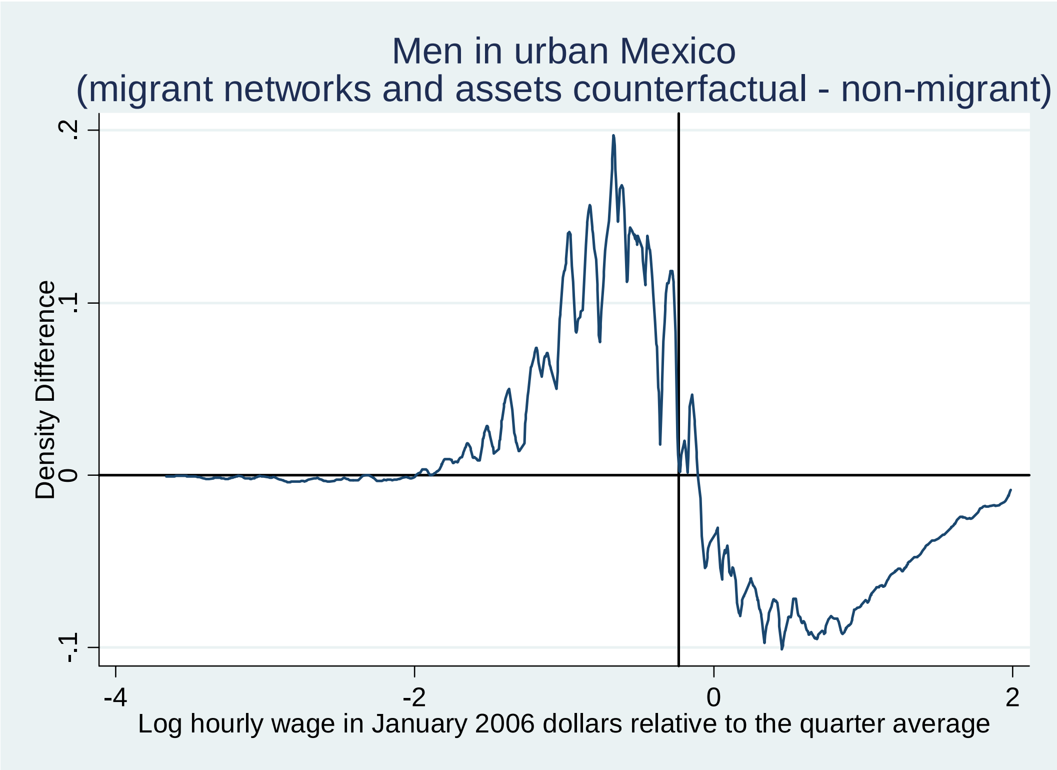
Figure 13:

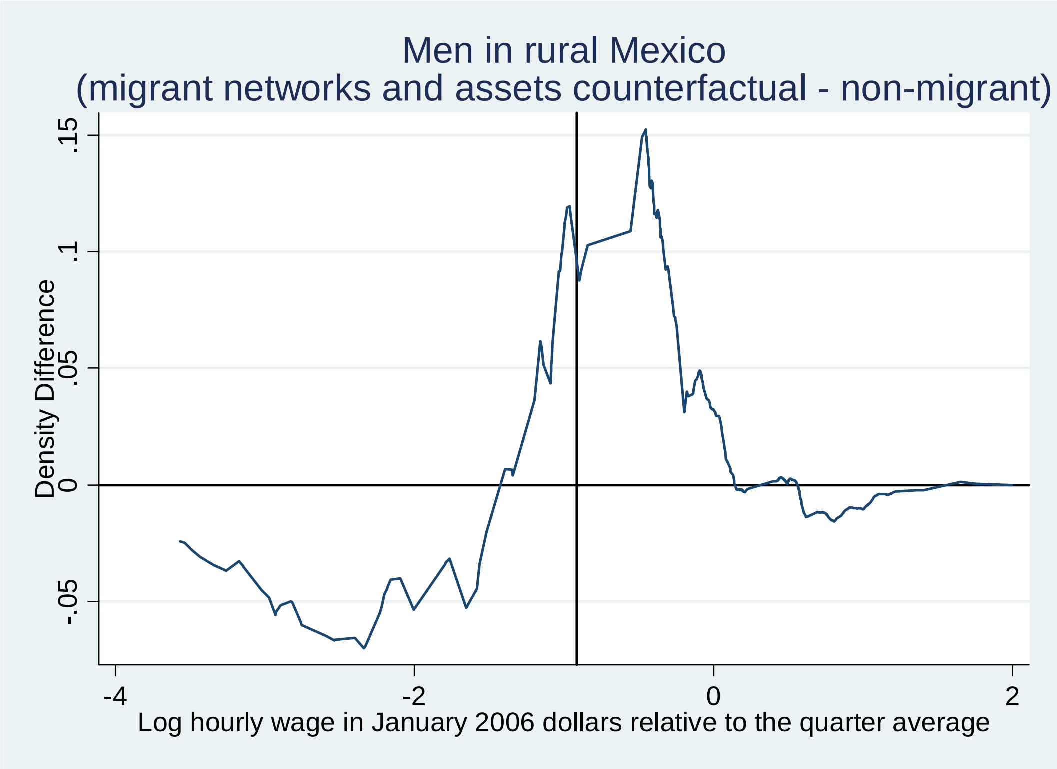




Source: ENET (2005). See figure 6 for an explanation. The calculation of the counterfactual includes the network variable, the McKenzie (2005) asset index, their interaction and their interactions with schooling groups.

Figure 14:





Source: ENET (2005). Counterfactual migrant wage density minus actual non-migrant wage density computed in figure 13. See figure 13 for an explanation. The solid black vertical line represents the median of the log of the relative wage distribution.

E Appendix Tables

Table A1:

Year	Quarter	After one quarter	After two quarters	After three quarters	After four quarters
		Attrition (non matched individuals from quarter to quarter)			
2000	2	12%	18%	26%	27%
	3	10%	18%	20%	27%
	4	11%	14%	16%	19%
2001	1	7%	12%	16%	19%
	2	7%	12%	16%	19%
	3	8%	12%	18%	20%
	4	8%	13%	23%	29%
2002	1	9%	20%	25%	21%
	2	15%	19%	18%	32%
	3	7%	10%	24%	32%
	4	6%	21%	31%	33%
2003	1	19%	29%	32%	39%
	2	23%	26%	30%	29%
	3	14%	19%	17%	30%
	4	12%	13%	27%	17%
2004	1	7%	24%	15%	
	2	21%	13%		
	3	9%			
Average		11%	17%	22%	26%

Source: ENET (2005)

Table A2:

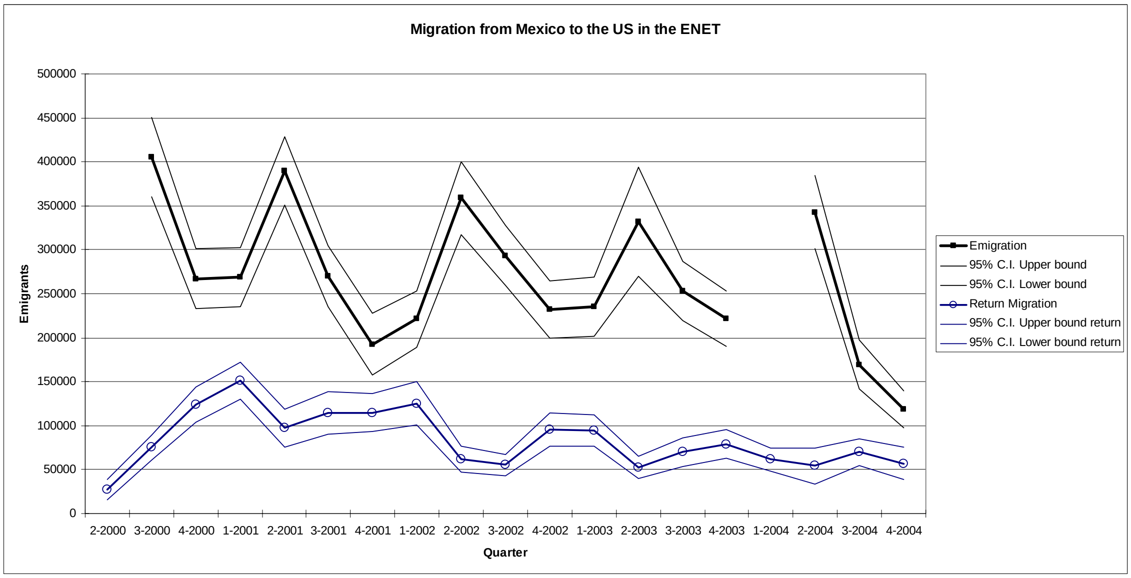
Summary Statistics (US sources on recent Mexican immigrants)

Individuals aged 16 to 65		US Census 2000 *Arrived a year earlier*	ACS 2000 *Arrived a year earlier*	ACS 2000-2004 *Arrived a year earlier*
Percent Male		62%	66%	64%
		(0.00)	(0.03)	(0.01)
Men				
Age				
	Average	26.6	27.2	28.0
		(0.09)	(0.89)	(0.30)
	Median	24	24	25
Schooling years				
	Average	8.6	8.9	8.9
		(0.04)	(0.33)	(0.12)
	Median	9	9	9
Hourly wage in 2006 dollars				
	Average	10.16	8.10	9.75
		(0.12)	(0.44)	(0.28)
	Median	7.94	7.14	7.75
Observations		21,930	244	2,658

Source: Ruggles et al. (2004)

F Appendix Figures

Figure A1:



Source: ENET (2005)