

Wage Gaps, Migration, and Development:

A View from Both Sides of the Border

*(preliminary version)**

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Abstract

High demand for entry into relatively wealthy countries from relatively poor countries is at least partly motivated by the potentially enormous wage gains available to those deciding to undertake international migration, an activity which is limited to some extent by governments across the entire world. Much research has examined motives for migration, the effects of immigration on receiving countries, and the effects of migration on sending countries, among other issues related to international migration. Additional research has measured the gains in efficiency accruing from an ever increasingly freer movement of goods and capital. However, freer human mobility and the effects of migration on the migrants themselves have not garnered nearly as much attention. In examining these issues, I present novel data collected through household interviews in communities both in Mexico and the United States, comparing the absolute and relative wage gains for interviewees with data from existing Mexican surveys. Upon crossing the border, even given the cost of migration, migrants indeed stand to collect large net gains, average incomes increasing more than fivefold immediately and moving from the lower deciles of origin wage distributions to the top deciles, these results surpassing those of some of the most successful current programs of economic development.

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I. Introduction

If a Mexican-born U.S. resident filed a visa application for a sibling living in Mexico 16 years, 5 months ago, that resident and sibling would just now be receiving a verdict. If the U.S. resident happened to be born in the Philippines, having filed an application for a sibling still living in the Philippines, they would be waiting even longer - currently up to 23 years and 9 months.¹ While these astonishingly long lines at the United States border are clearly partly driven by U.S. immigration policy restrictions, specifically yearly quotas limiting the supply of immigrant visas depending on visa class and country of origin, the lines also exhibit the demand for entry into the United States. In the above cases, demand is most likely enhanced by the existence of family connections, however the difference in wages and standards of living across countries is arguably the most important factor attracting immigrants from all over the world. This demand is reflected by the fact that 272 potential migrants applied for each visa awarded by the 2010 U.S. Diversity Visa Lottery for entry at-large, the lottery open to those meeting minimum qualifications and not applying through family connections to U.S. residents. This number rose to 393 per available visa in 2012.²

International migration demands attention from economists on a number of issues, many of which have already been examined extensively by the literature. Among a wide variety of topics, researchers focus on effects of immigration on the destination country (Amuedo-Dorantes and de la Rica, 2007); effects of migration on the origin country (Taylor and Dyer, 2009); remittances (Stark, 2009); migrant selection (McKenzie et al., 2010); and most recently, factors underlying individual attitudes toward immigration (Card et al., 2012). The recognition of the extreme amount of demand for entry in excess of permitted supply raises the issue of efficiency gains from the relaxation of existing restrictions on immigration, in addition to the separate need for increased attention to the

¹These scenarios are based on online priority date information from the U.S. Bureau of Consular Affairs. As of December 12, 2012, the website lists a priority date for processing of July 22, 1996 for Mexican siblings, while that of March 22, 1989 for Filipino siblings.

²The U.S. Bureau of Consular Affairs' website lists detailed statistics for the Diversity Visa Lottery from 2007-2012.

effects of migration on the migrants themselves. Only a handful of researchers have started to tackle these themes, especially crucial to potential migrants outside the OECD countries, given that studies generally find huge economic gains accruing to those who actually cross the border into the wealthier countries. For example, Clemens et al. (2008), hereafter CMP, calculates wage ratios for 42 developing countries of observably equivalent workers residing in the US compared to residing in the respective country of origin, adjusting for selection, estimating a median of over 4 for all countries examined. Furthermore, of the three areas of globalization (goods, capital, and labor), efficiency arguments clearly point to restrictions on labor mobility as the single largest remaining cause of market distortions and efficiency losses in the world economy, with goods and capital already enjoying much higher levels of relatively unrestrained mobility. Pritchett (2006) succinctly signals the huge disparity in possible worldwide efficiency gains from the three areas of globalization, comparing a gain of \$65 billion from complete capital liberalization (Caselli and Feyrer, 2007), a gain of \$107 billion from complete trade liberalization (World Bank, 2005), and the massive gain of \$65 trillion from complete labor mobility (Hamilton and Whalley, 1984; Klein and Ventura, 2004). Even a slight relaxation of labor mobility restrictions would result in huge efficiency gains, estimated at \$170 billion given a 3% increase in migrants in the labor forces of OECD countries (Walmsley and Winters, 2005).

Accepting the potential gains as a given, the issue turns to one of ethics, as limiting labor mobility is the only remaining widely accepted discrimination based on a characteristic determined by birth, that of national origin. By sustaining strong restrictions on labor mobility, wealthy countries are implicitly valuing potentially miniscule losses to small groups of existing residents more than the huge potential gains to new residents simply based on country of birth, difficult to justify on any ethical grounds.³ Both economic efficiency and ethical arguments lead to unequivocal support in

³The total welfare gain or loss related to immigration remains relatively controversial, with recent research from di Giovanni et al. (2013) finding that natives in migrant-receiving countries actually experience long-run gains from increased migration. Good (2012) among others, points to additional benefits of immigration to destination countries less frequently considered in the welfare analysis of immigration, such as the pro-trade effect that immigrants provide. With estimates of approximately \$2500 annual extra exports associated with each extra immigrant between the respective US state of residence and Mexican state of origin, this oft-ignored benefit of immigration clearly carries

favor of more labor mobility, arguments that become even stronger if viewing human mobility in the light of its current and potential contributions to economic development. As stated by Clemens and Pritchett (2008), "...crossing international borders is not an alternative to economic development, it is economic development." Indeed, 23 of every 100 Mexicans earning more than \$10/day live abroad; 87 of every 100 Haitians earning more than \$10/day live abroad. Simply put, while migration is much more a complement to rather than a substitute for more traditionally accepted development strategies, migration indeed makes a large contribution to the economic development of migrants themselves.

My analysis examines the connection between existing wage gaps, migration, and migration's power for development, coinciding with CMP in its attempt to bring these issues to the forefront of the international migration and economic development research agendas. My empirical analysis relies heavily on two datasets - first, a novel dataset compiled from personal interviews with migrants in the U.S. as well as households in high-migration communities in Mexico, and second, *La Encuesta sobre Migración en la Frontera Norte de México* (EMIF) dataset captures human flows between the United States and Mexico. By way of the detailed survey information from both EMIF and my original data, as well as Mexican census data, I allow for a comparison across the differing samples in attempting to answer the following questions: (1) What are the wage gains for migrants arriving to and working in the United States? (2) Where in the origin wage distribution do migrants come from? (3) Where in the origin wage distribution do migrants end up?

In examining the first question, I contribute to the limited number of existing estimates detailing international wage gaps. Mexican household survey information, along with the data mentioned above, allows for the calculation of exact wage gains for the subsample of migrants reporting before- and after-migration wages in both EMIF and the new data. In answering the second, I focus on the issue of selection, clearly relevant in thinking about possible future gains from further migration. I again combine the existing household survey data with the EMIF and new data in both qualitative and quantitative importance.

pinpointing migrants' starting positions within the origin wage distributions. Finally, in examining the third, I contribute evidence to migration's power of development. Specifically, I take the gains to migrants from question one and place these post-migration wages in the origin wage distribution, allowing for a dynamic comparison of migrants' before- and after-migration wages relative to the relevant origin community. Opting to adopt the approach of Clemens and Pritchett (2008) and focus on people rather than places in terms of development, addressing these three questions systematically allows me to obtain succinct measures of migrants' economic development, in addition to the development relative to those remaining in origin communities. In particular, the figures for migrants' wage gains from the subsamples make a much needed contribution; estimates for gains based on comparing outcomes for observably similar workers are somewhat more common, however gains calculated based on comparing outcomes for observably and unobservably identical workers - *the same individuals* - are few and far between.

I find that the migrant groups under examination enjoy immediate average wage gains from migration of over \$5 (at Purchasing Power Parity) per hour worked, resulting in average income increases of over fivefold. These absolute wage gains translate into average relative movements within origin wage distributions of upwards of 50 and 60 percentiles, respectively, for the main two groups studied. Additionally, all but two of the approximately 40% of migrants in poverty before migration are able to rise above the poverty line by moving across borders. In continuation, section II highlights issues related to the data, section III discusses the results, while section IV concludes.

II. Data and Background

My analysis draws on three datasets: the 2010 Mexican Census, EMIF covering the years 1999-2009, and the original data collected through household interviews in communities both in Mexico (HIMEX) and the United States (HIUS). The EMIF data provides a first look into the actual wage gains accruing to Mexican migrants choosing to cross the border, as the population working in

the U.S. and reentering Mexico in order to visit can be correctly identified through the survey results. The population that provides an answer as to wages in the U.S. and the wages earned in Mexico immediately before migration form my EMIF sample under examination. It is important to point out that this sample does not address the wage gains question as exactly as we would like, as migrants report current wages in the U.S. as opposed to the wages received immediately after migration to the U.S. during the interview upon reentry into Mexico. Assuming that with time comes added experience, skills, and possible adaptation to a new labor market that contributes to higher productivity and results in higher wages, this clearly has the potential of biasing the apparent wage gains upward, entirely dependent on how much time has passed between time of migration and the time of the EMIF interview.⁴

The novel HIMEX and HIUS data address this shortcoming directly, detailing migrants' wages both immediately before and after migration. Although in some cases the physical process of migration can be a long one, possibly even several months, it is difficult to argue that during that time any new experience, skills, or any other factor that would potentially affect the wage-earning ability of an individual are acquired; this time is spent just migrating. Therefore, the only change affecting wages is physical geographic location; a migrant simply leaves one labor market in order to enter another, allowing for complete identification of the wage gains stemming from migration.

HIMEX and HIUS data are the result of household interviews, conducted both in Mexico and the U.S., following a format similar to that of the Mexican Migration Project (MMP). HIMEX comprises 264 interviews in the state of Veracruz, Mexico, a state for which U.S.-destined migration has increased in recent years, while HIUS is formed by 187 interviews in South Florida. While the HIMEX and HIUS samples do not necessarily provide data representative of the entire Mexico-U.S. migrant population, they do contribute two snapshots that are representative at the respective

⁴Length of time between migration and the EMIF interview varies across the waves of the EMIF, clearly increasing in recent years, with the averages as follows: 33 months in 2009, 25 months in 2008, 24 months in 2007, 19 months in 2006, 18 months in 2005, 17 months in 2004, 16 months in 2003, 13 months in 2002, 13 months in 2001, 11 months in 2000, and 11 months in 1999.

community level, as households are randomly selected within communities for participation. Random selection is based on a process of dividing communities into equally-sized blocks based on satellite map imagery, and the subsequent verification of mapping of all community blocks in person upon arrival at each specific location.⁵ The random selection on both sides of the border provides a key difference between my data and that of the MMP. The MMP uses the “snowball method” relying on personal references in U.S. migrant communities; since random selection is used in both Veracruz and South Florida in my survey, both samples indeed are representative of the communities surveyed.

In addition to absolute wage gains, relative income gains are often argued to be a potential benefit of importance to migrants. If an individual’s income is not only increasing in absolute terms, but is also growing relative to that of the appropriate reference population, migration may be even more attractive.⁶ The Census data allows for the construction of the origin wage distributions from which the migrant sample migrates.⁷ In turn, inserting the HIMEX and HIUS pre- and post-migration wages into the respective origin wage distributions permits a clear comparison of the relative position of migrants in the associated income distributions pre- and post-migration.

For purposes of comparison, all wages are converted to 2011 US dollars at Purchasing Power Parity (P\$) by using World Bank (2012) GDP conversion factors, as well as the US CPI-U series. Observations containing apparent reporting errors as to wages are dropped from the EMIF and Census data.⁸ I use eleven waves of EMIF data, the average sample size being 6,480. Those migrants reporting wages earned in the U.S. and wages earned in Mexico immediately before migration average 480 per wave. I extract the Census data for the nine states and fifteen different Mexi-

⁵HIMEX and HIUS refusal to participate rates reach 12% and 25%, respectively. The number of observations containing both pre- and post-migration wages included in the calculation of the results presented in the remainder of the paper are 128 and 69, respectively, due to incomplete answering of the survey.

⁶See Stark and Taylor (1991) for an exposition on the potential importance of these relative differences, coined relative deprivation.

⁷The 2010 Census includes data on wages and various units of time of the wages reported, allowing for a simple calculation of the hourly wage.

⁸This includes hourly wages less than \$0.20 (2011 P\$) and clear reporting errors, such as an hourly wage for manual labor of \$450 or \$1050.

can *municipios* (municipalities) represented in the HIMEX and HIUS populations, then examining the relative gains at the municipality level. Approximately one-third of Census observations contain wage information, examined municipalities ranging from 1,323 to 17,721 in the number of reported wages.⁹

Table 1 outlines summary statistics from the gathered data on migrants, including mean, median, standard deviation, and range for each of the two main samples. In comparing the two samples, on average HIMEX migrants have higher pre- and post-migration wages; furthermore, they are slightly younger at the time of the interview, more likely to be male, more educated, and less settled in destination communities (by number of years since migration), relative to HIUS migrants. Additionally, 66% and 80% of HIMEX and HIUS migrants are married, respectively. HIMEX migrants are more likely to send remittances than HIUS migrants (21% and 25%, respectively, report sending no remittances); those HIMEX migrants who do send remittances send more on average than HIUS migrants, the respective averages representing 18% and 12% of post-migration wages.¹⁰

⁹Due to lack of available data, Mexico City, which encompasses various municipalities, is not examined at the municipality level.

¹⁰This percentage calculation assumes a 40-hour workweek and four weeks of monthly work, as remittances are reported by migrants on a monthly basis.

Table 1. Summary statistics of migrant samples

Sample	Mean	Median	Std. dev.	Min./max.
HIMEX ($n = 128$)				
Pre-migration wage (P\$/hr.)	1.87	1.79	0.69	0.84/5.77
Post-migration wage (P\$/hr.)	8.93	7.83	3.12	5.92/24.23
Age at interview	38.02	37	21	75
Gender (male= 1, female= 2)	1.28	1	0.45	1/2
Years of schooling	8.80	8	2.75	3/16
Years since migration	11.89	12	6.61	1/44
Remittances (monthly P\$)	181.25	200	0	1000
HIUS ($n = 69$)				
Pre-migration wage (P\$/hr.)	1.75	1.49	1.25	0.25/8.57
Post-migration wage (P\$/hr.)	6.96	6.73	1.37	4.14/14.04
Age at interview	40.44	39	13.55	18/76
Gender (male= 1, female= 2)	1.48	1	0.50	1/2
Years of schooling	6.65	6	3.67	0/14
Years since migration	16.77	14	9.31	1/45
Remittances (monthly P\$)	102.20	100	0	300

III. Results and Discussion

1. Absolute wage gains

In discussing the results, I use the following straightforward definitions for wage differences (D_{Wi}) and wage ratios (R_{Wi}):

$$D_{Wi} = W_{i,post} - W_{i,pre} , \quad (1)$$

where $W_{i,post}$ and $W_{i,pre}$ are hourly wages for individual i adjusted to 2011 P\$ immediately post- and pre-migration, respectively, and

$$R_{Wi} = \frac{W_{i,post}}{W_{i,pre}} . \quad (2)$$

I. HIMEX

Figure 1 summarizes the pre- and post-migration wages for HIMEX emigrants. On average, a HIMEX emigrant gains P\$7.06 in hourly wages by leaving Mexico and entering the U.S. This gain in wages is immediate, representing the wage gains due purely to geographic relocation. Table 2 and Figure 2 signal that this average disguises considerable variation in gains across the population, with $D_{W_i} \in [3.44, 20.53]$, however all emigrants certainly enjoy positive wage gains from crossing the border. Considering an alternative measure of wage gains, that of wage ratio R_{W_i} , the average ratio of HIMEX emigrants is 5.24, meaning that emigrants face earning more than five times in post-migration wages than those earned immediately before migration. Figure 3 highlights the variation across individuals in R_{W_i} , this measure ranging from 1.91 to 13.65. Without a benchmark for comparison, it is difficult to judge whether these gains are “small” or “large,” although at first glance the gains to migrants seem quite substantial. However, simple observation using measures of poverty helps to start put in perspective the magnitude of gains accruing to migrants willing and wanting to cross the border in the HIMEX sample. A considerable amount of the HIMEX population is moving out of poverty, whether using the Mexican or U.S. definition of the poverty line. Immediately before undertaking migration, 30% of HIMEX migrants are below the Mexican poverty line of \$1904 (unadjusted) pesos per month established by the *Consejo Nacional de Evaluación de la Política de Desarrollo Social* (CONEVAL).¹¹ Immediately after migration, with an average wage of P\$8.92 per hour, *zero* HIMEX migrants are in poverty measured by the 2012 U.S. standard of \$11,170 (unadjusted) annual dollars; the entire portion of impoverished individuals not only springboards out of poverty by the Mexican measure, poverty is no longer found in this population even when measured by the more stringent U.S. poverty line.

Figure 1

¹¹For ease of exposition, I use the most recent poverty line *pobreza patrimonial* from 2008, although the CONEVAL has also adopted a multidimensional strategy for measuring poverty in Mexico based on factors other than just income.

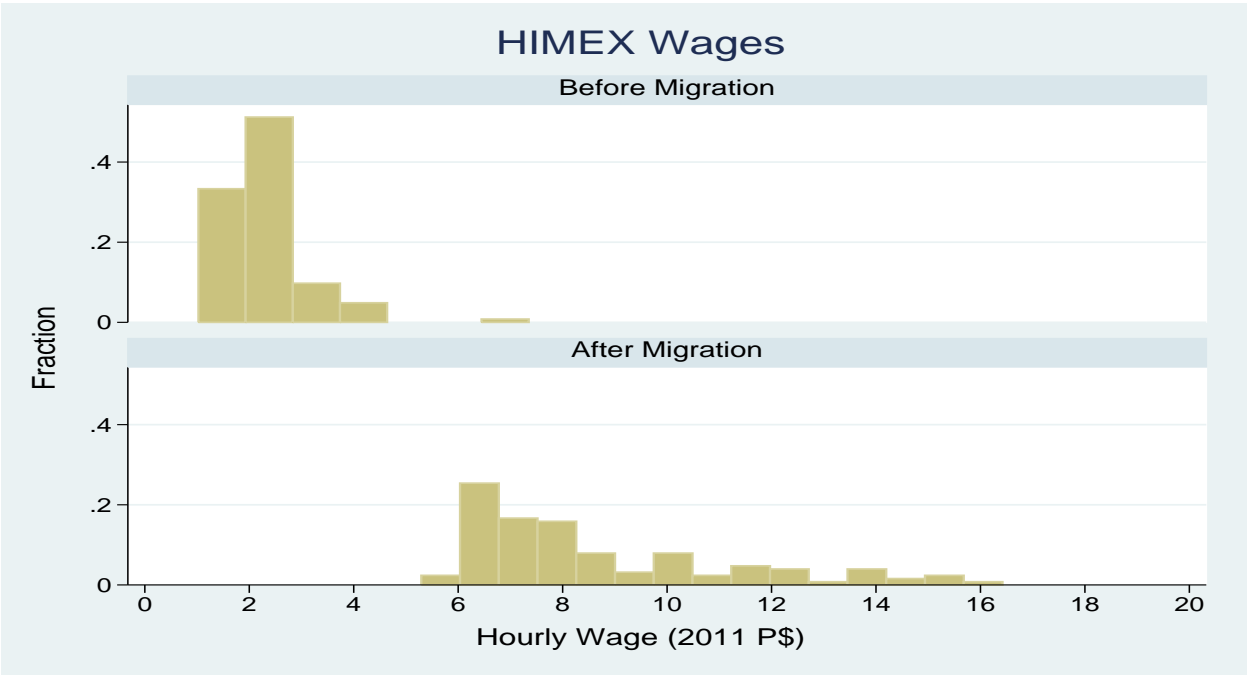


Figure 2

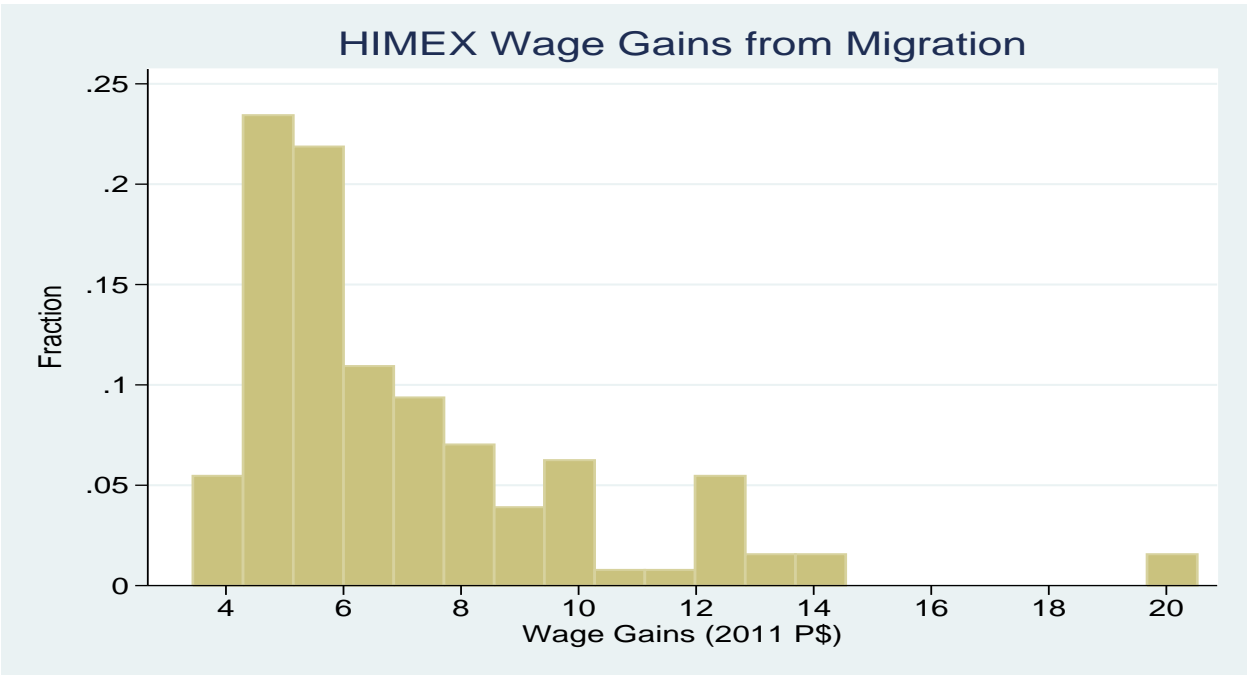


Figure 3

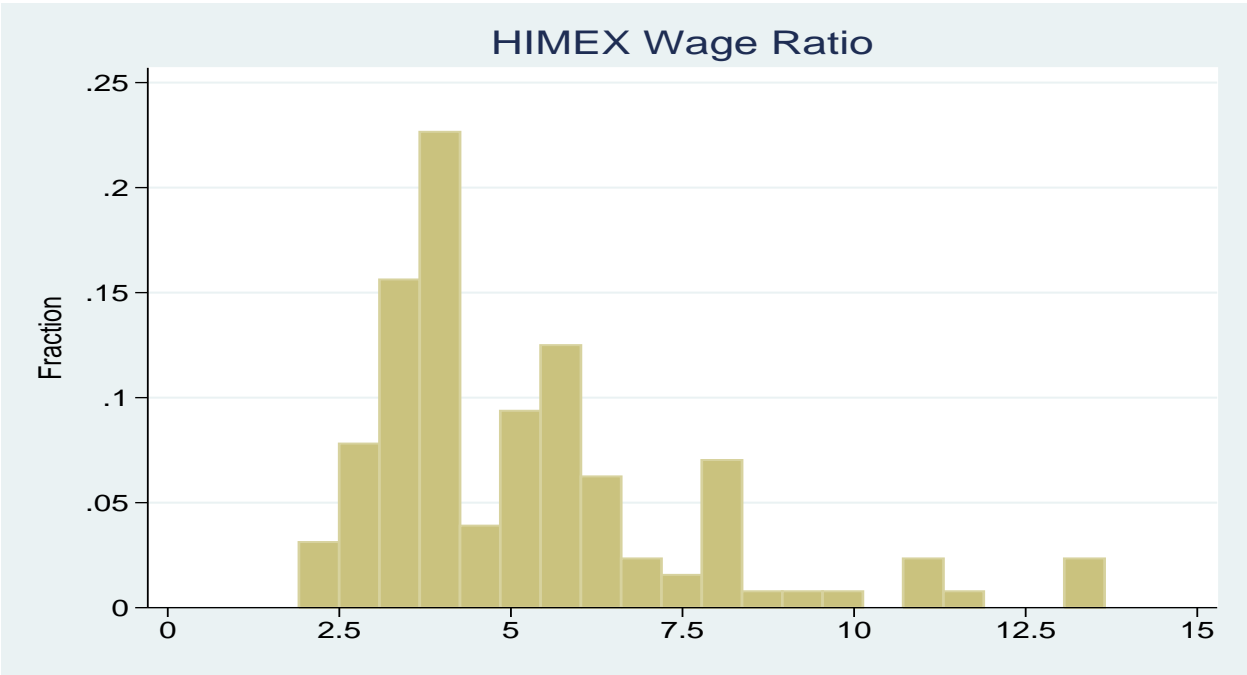


Table 2. Migrant wage gains

		Pre-migration wage		Post-migration wage		Wage difference			Wage ratio		
		Average	Median	Average	Median	Average	Median	Std. dev.	Average	Median	Std. dev.
HIMEX		1.87	1.79	8.93	7.83	7.06	5.87	1.21	5.24	4.50	4.01
HIUS		1.75	1.49	6.96	6.95	5.22	5.15	3.03	5.56	4.29	2.36
EMIF											
2009	full	2.44	2.12	10.12	9.36	7.68	7.12	4.08	5.29	4.68	3.13
	<12 months	2.55	2.11	9.69	8.67	7.14	6.73	4.16	4.69	4.10	2.68
2008	full	2.99	2.32	10.62	9.36	7.62	6.92	5.40	4.73	3.99	3.12
	<12 months	3.63	2.61	10.05	9.1	6.42	6.58	3.94	3.92	3.59	2.12
2007	full	2.91	2.20	10.34	9.00	7.43	6.56	5.26	4.87	4.13	3.47
	<12 months	3.55	2.44	10.36	8.64	6.82	6.25	4.78	4.21	3.69	2.55
2006	full	3.09	2.23	10.06	8.96	6.97	6.45	5.22	4.75	4.03	3.70
	<12 months	3.30	2.27	10.06	8.96	6.76	5.95	6.26	4.56	3.74	3.91
2005	full	2.92	2.35	10.03	9.2	7.10	6.44	5.07	4.84	3.85	3.57
	<12 months	3.06	2.39	10.08	8.63	7.01	6.33	5.29	4.55	3.74	3.52
2004	full	2.76	2.07	9.68	8.93	6.92	6.26	4.55	4.83	4.05	3.15
	<12 months	2.78	2.07	9.39	8.33	6.61	6.08	4.82	4.54	3.74	2.94
2003	full	2.90	2.24	9.10	8.54	6.20	6.00	4.38	4.65	3.92	3.42
	<12 months	3.04	2.32	8.91	8.24	5.87	5.69	4.12	4.22	3.64	3.23
2002	full	2.81	2.12	9.16	8.75	6.35	6.17	4.28	4.85	3.93	3.57
	<12 months	2.98	2.12	8.86	8.52	5.89	5.91	4.11	4.56	3.93	3.34
2001	full	2.67	1.98	9.18	7.94	6.51	6.18	4.77	5.14	4.54	3.67
	<12 months	2.66	2.01	9.01	7.83	6.36	5.94	4.81	4.73	4.21	3.11
2000	full	2.42	1.79	8.81	7.86	6.39	6.17	3.71	5.27	4.65	3.30
	<12 months	2.48	1.79	8.66	7.86	6.19	6.12	3.50	5.00	4.50	3.05
1999	full	2.56	1.80	9.13	8.10	6.57	6.07	5.06	5.29	4.50	3.52
	<12 months	2.50	1.80	8.97	8.1	6.47	6.00	4.83	5.22	4.43	3.53

II. HIUS

Figure 4 shows hourly wages for the HIUS migrants pre- and post-migration. By visual inspection, the distributions are quite similar to those of the HIMEX sample; Table 2 highlights that HIUS migrants have a slightly lower pre- and post-migration hourly wage than their HIMEX counterparts, averaging P\$1.75 and P\$6.96, respectively. Average absolute wage gains of P\$5.22 accrue to HIUS migrants, coming up short of those of HIMEX migrants. However, the distribution of those gains exhibits more homogeneity for HIUS migrants than for HIMEX migrants, with $D_{Wi} \in [1.77, 8.80]$, as evidenced in Figure 5.

As displayed in Figure 6, HIUS migrants enjoy an average wage ratio of 5.56, nearly mirroring the HIMEX average wage ratio; even the migrant gaining the least in magnitude still enjoys considerable wage gains, enjoying a wage ratio of 1.41. Again framing the evidence in terms of the Mexican and U.S. poverty lines, 63% of HIUS migrants live in poverty pre-migration, earning less than \$1904 pesos per month. Astoundingly, the act of migrating moves all but two migrants above the U.S. poverty line of \$11,170 annual dollars in post-migration wages, while zero are left in poverty by the Mexican measure.

Figure 4

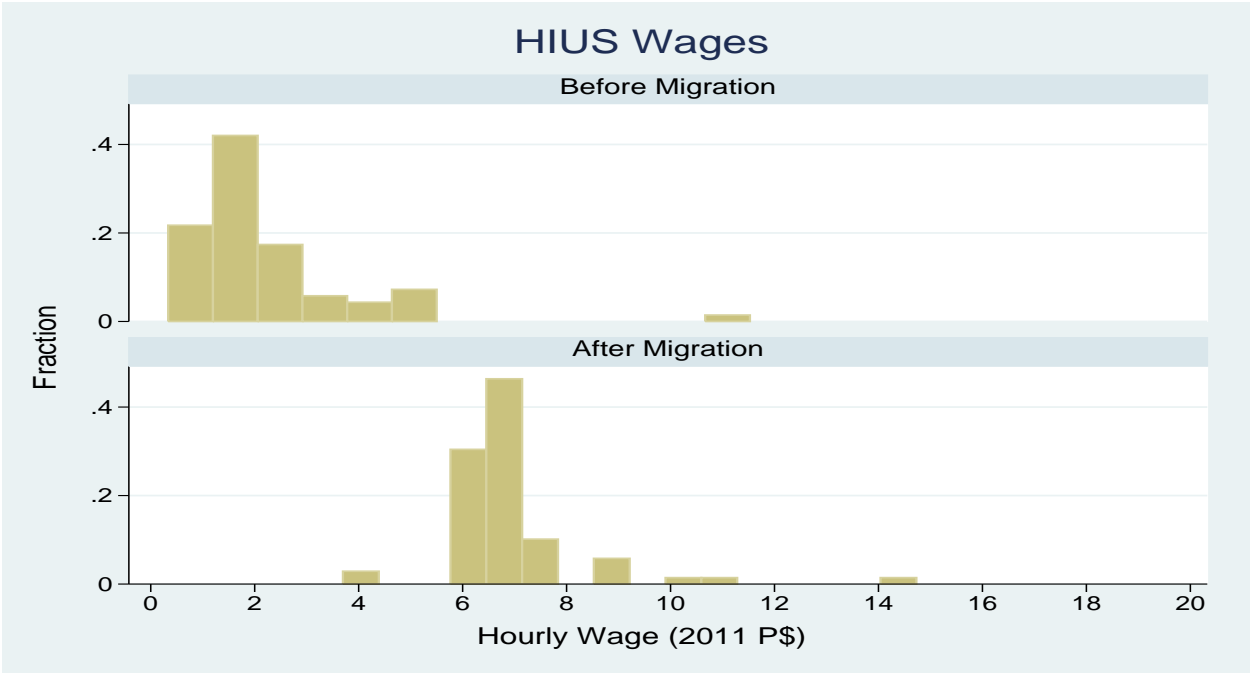


Figure 5

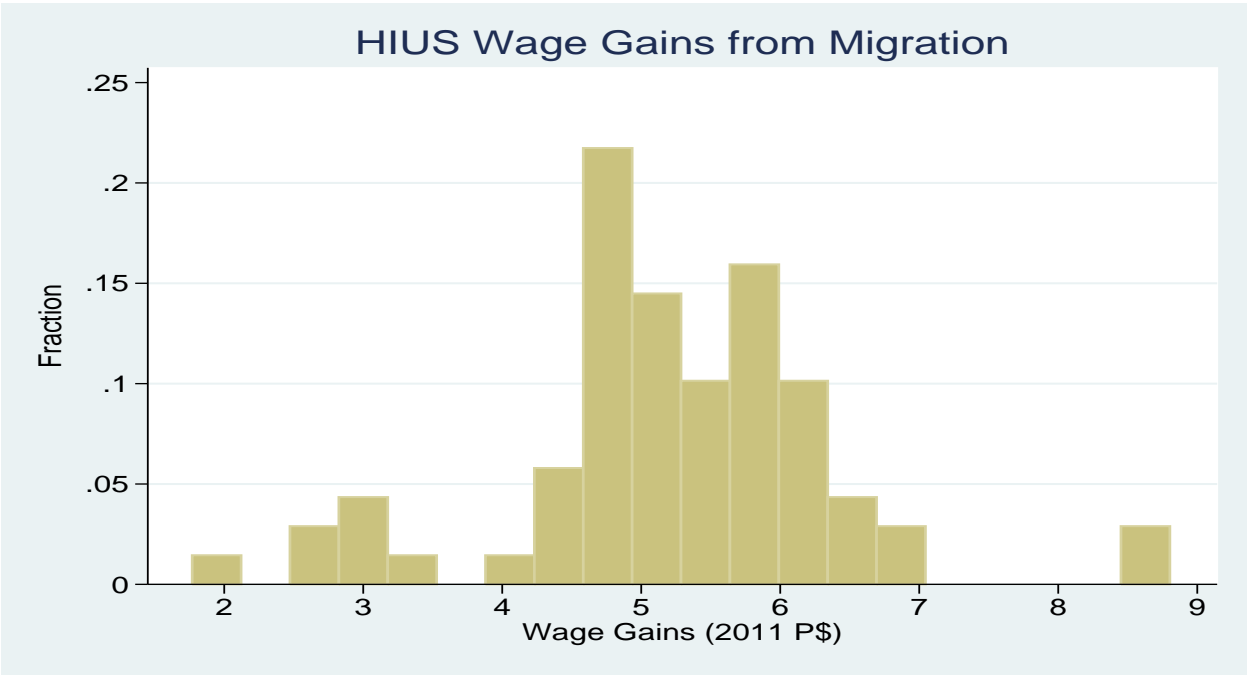
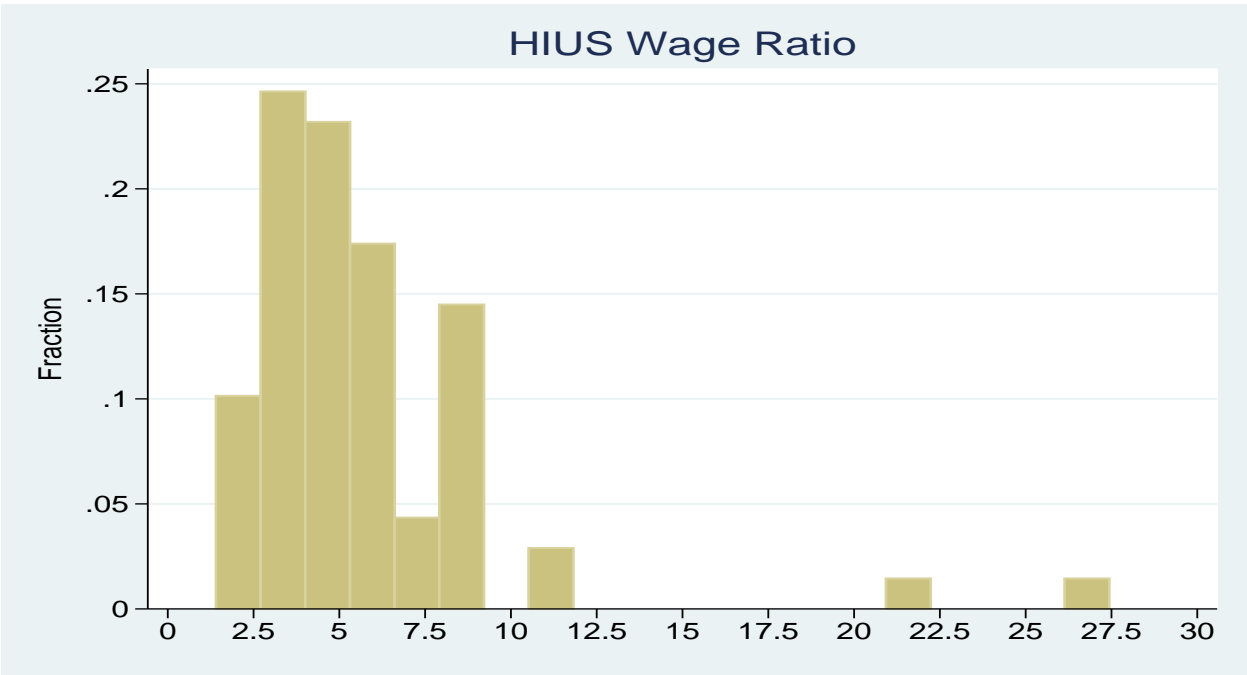


Figure 6



III. EMIF

Although the variation in time elapsed between each individual's migration and the corresponding EMIF survey is problematic for identifying the wage gains due solely to geographic mobility, the data provides a benchmark for comparing the gains found in the HIMEX and HIUS samples, especially useful since the EMIF provides a representative sample of Mexican border crossers.¹² Figure 7 depicts the absolute wage gains accruing to EMIF-surveyed migrants, showing the distribution of pre-migration versus post-migration hourly wages. For both wage distributions and the resulting wage ratios displayed in Figure 8, results are extremely consistent across the eleven EMIF waves examined, with only the slight amount of variation noted by comparing averages (medians) from Table 2. The full EMIF samples exhibit a wage difference range (in averages) from a minimum of P\$6.20 (2003) to a maximum of P\$7.68 (2009); wage ratio averages lie between 4.65 (2003) and 5.29 (1999 and 2009). While HIUS average wage differences fall short of those of the EMIF samples due to overall lower wages (both before and after migration), both HIMEX and HIUS wage ratios reside near the upper limit of the EMIF samples, HIUS average wage ratios eclipsing all EMIF averages at 5.56.

In the interest of further detailing the true amount of wage gains attributable solely to migration, I trim the EMIF samples by analyzing wage changes for only those migrants who report fewer than twelve months elapsed between migration and the EMIF interview. With this limited window of time, it is reasonable to assume that the U.S. wages reported in the EMIF interview are equal to the wages received immediately after migration. Given the expectation that both wage ratios and wage differences are biased upward as longer time periods elapse between migration and the EMIF survey, the revised samples should return both attenuated wage differences and wage ratios compared to those of the full EMIF samples. Table 2 confirms the hypothesized effect, as both wage differences and wage ratios drop across all EMIF waves for the subsample reporting less than twelve months elapsed. However, perhaps somewhat surprisingly the decreases are not large in magnitude, leaving two possible explanations. First, migrant workers may not be enjoying as much wage growth as expected after arrival in the U.S., most wage gains actually accruing immediately

¹²See *Secretaría del Trabajo y Previsión Social* (2012) for details on methodology of the EMIF.

upon arrival due exclusively to migration. Second, differences in time elapsed between the trimmed sample of less than twelve months and the rest of the sample may not be large enough to permit wage growth over time to take on any magnitude of significance in the present analysis. Average wage differences ranging from P\$5.87 (2003) to P\$7.14 (2009) approach those of HIMEX and HIUS migrants, while HIMEX and HIUS average wage ratios lie just above the trimmed samples' range of 3.92 (2008) to 5.22 (1999).

Figure 7

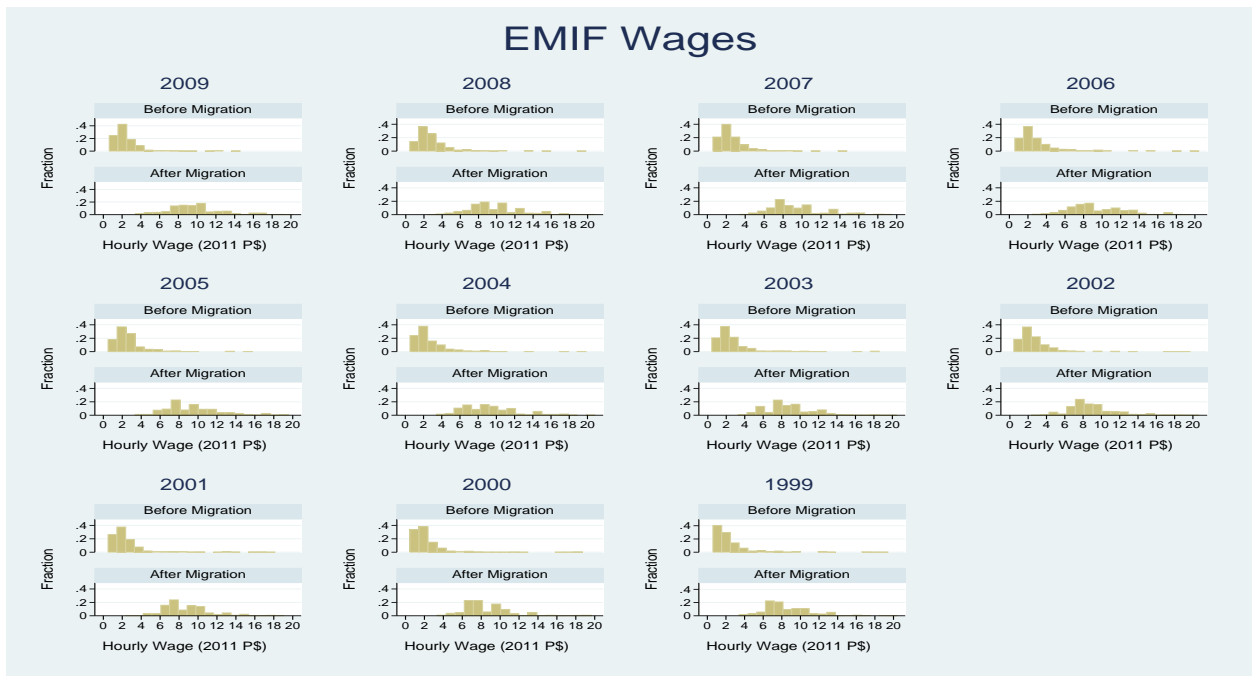
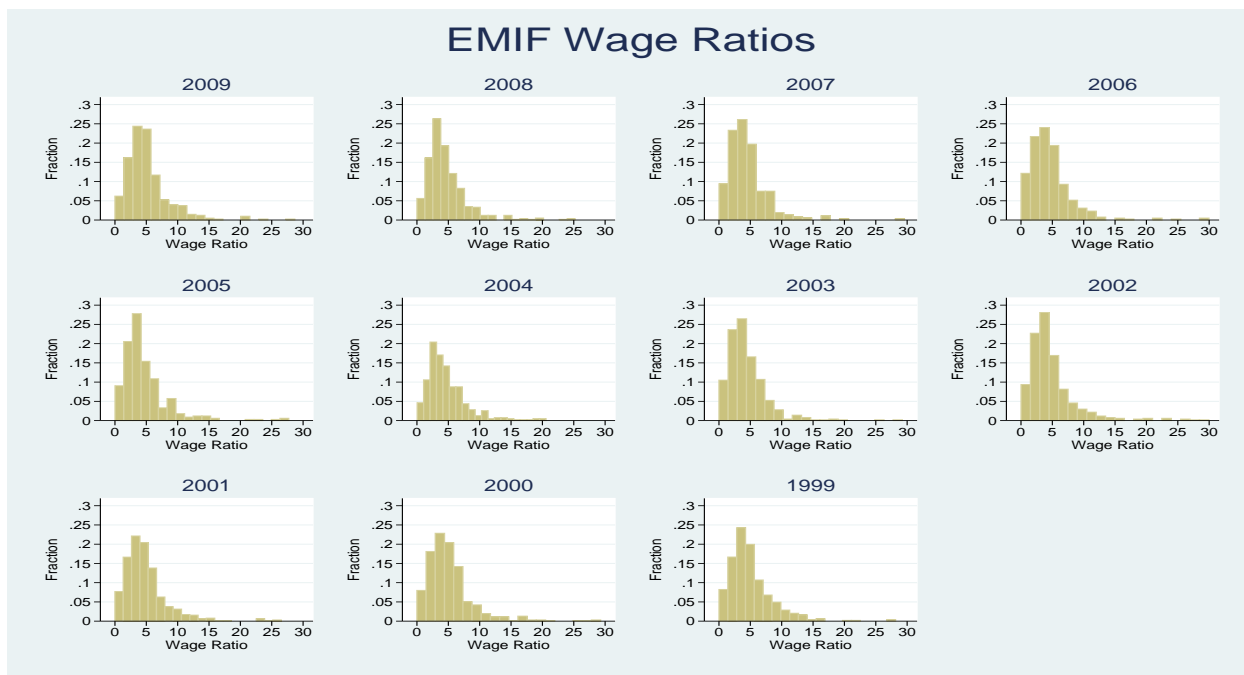


Figure 8



In further examining these results, I again rely on CMP and Pritchett (2006) in making comparisons with various wage ratios discussed in the literature. CMP provides a convenient benchmark estimate for comparison with R_{Wi} , however it is important to note that this estimate is generated from much different data and *observably equivalent* workers, adjusted for selection, while my figures are calculated comparing *observably and unobservably equivalent* workers; the CMP measure of R_e (comparable to R_{Wi}) for Mexico is estimated as 2.46, after adjustment for selection. Pritchett (2006) highlights other types of wage discrimination dependent on aspects such as race or gender; for example, the 1995 male-female wage ratio in the US is estimated as 1.3 and in the median country as 1.4, while the 1939 US white-black wage ratio has been estimated at 1.6. While these wage ratios pale in comparison to both the R_e of CMP and even the lowest of my calculated wage ratios, ironically they receive much more attention than the wage ratios mentioned in this paper. With no formal restrictions on worker mobility, one might imagine a R_{Wi} approaching the geographic ratios also mentioned in Pritchett (2006) of the 1999 urban-rural wage ratio of 1.4 averaged over 43 countries, or the 1999 US-Puerto Rico wage ratio of 1.5.¹³

¹³Even with no restrictions on worker mobility, it is reasonable to expect the sustainability of wage ratios greater than 1, as the costs of moving, including potential differences in language, customs, culture, etc. make relocating less

2. *Relative wage gains*

Examining relative wage gains provides a second perspective on the economic benefits migrants enjoy by moving across the border. The widely-studied idea of relative deprivation highlighted in Stark and Taylor (1991) forms the theoretical foundation for my strategy of placing the migrant pre- and post-migration wages into the wage distribution of the origin communities, specifically at the municipality level. This allows for a straightforward inspection of where in the distribution migrants come from, and where in the distribution migrants end up. The selection of the origin community as the relevant reference group is simple to justify as the majority of migrants in the HIMEX and HIUS samples maintain strong connections with family members in Mexico, migrants often crossing the border without their immediate families. Anecdotal evidence confirms this idea as well, as several interviewees in Mexico explained, “If you want to talk to the migrant families, just look for the nicer houses.” Some of these houses are the result of individual male migrants sending money to their respective wives who have stayed behind in Mexico, while some are the result of accumulated savings for a migrant who decided to make the move back to Mexico after some time in the U.S. - in either case, the evidence indeed points to the origin community as the appropriate group of reference. While reference groups may be subject to partial or complete revision if a migrant becomes more (less) connected to the destination (origin) community, I assume this possibility away, especially given that the measured wage gains accrue immediately upon migration, when migrants are arguably just as connected to origin communities as before undertaking migration.¹⁴

I. HIMEX

Figure 9 clearly shows the movement in the origin wage distribution that HIMEX migrants make. Pre-migration wages are concentrated in the lower half of the Census wage distribution, with the dashed-line bars representing these wages before relocation. Post-migration wages move to the

attractive relative to the origin.

¹⁴I relax this assumption in subsection 3, examining the possibility of revised groups of reference.

right tail of the distribution, dotted bars representing these relatively high wages after relocation. Figure 10 paints an even clearer picture of the relative movement, as it displays the percentiles of the origin wage distribution from which migrants come and the percentiles in which they end up immediately after migrating. HIMEX migrants are fairly evenly spread out among the Census distribution before migration, although the majority clearly come from below the median wage. However, the dotted bars represent the dramatic post-migration change; all migrants move to the upper two deciles of the origin wage distribution simply by migrating. Migrant pre-migration wages are spread between the 3rd and 92nd percentiles of the Census wage distribution, the average coming from the 38th and the median from the 40th; post-migration wages all fall in the upper section of Census wages between the 84th and 99th percentiles, the average falling in the 90th and the median in the 91st. As a result, the average HIMEX migrant leapfrogs over 52 percent of the reference population by undertaking migration.

Figure 9

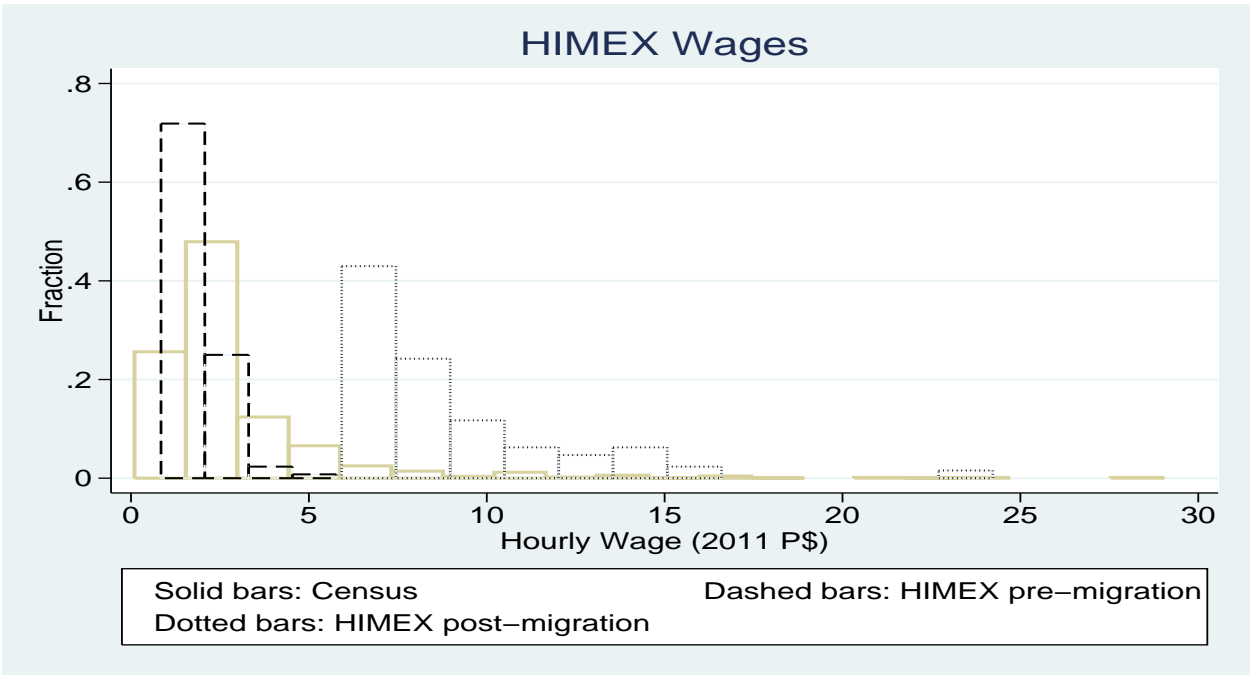
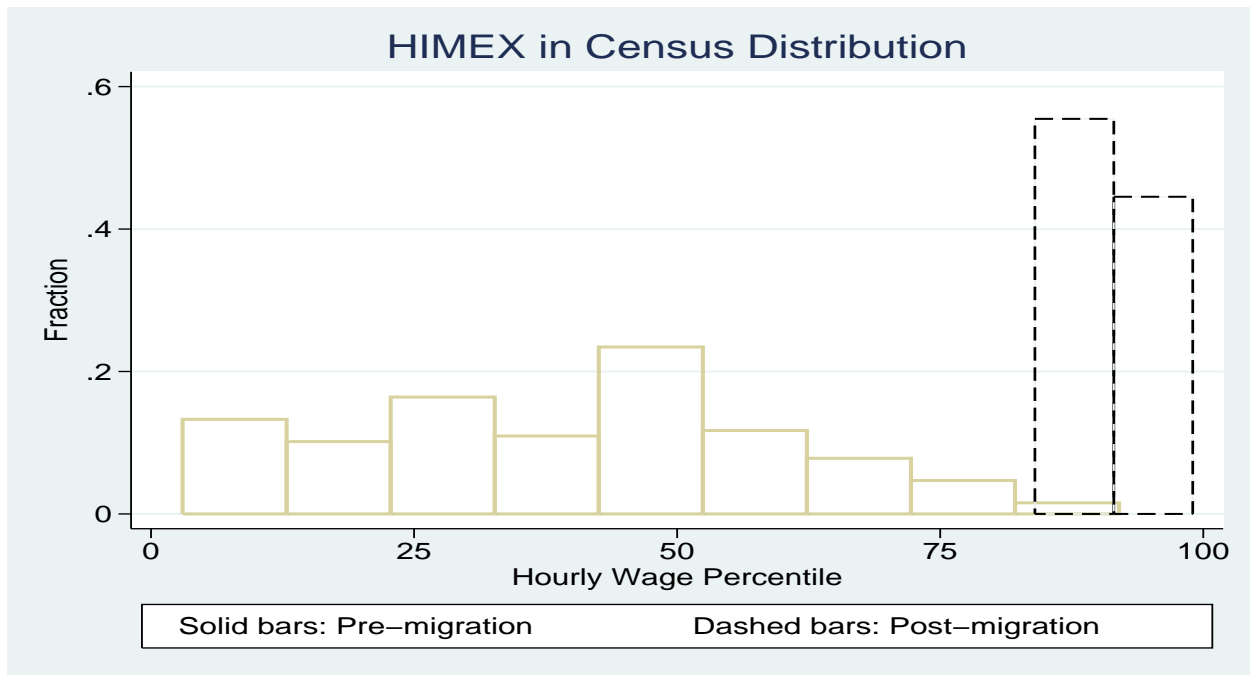


Figure 10

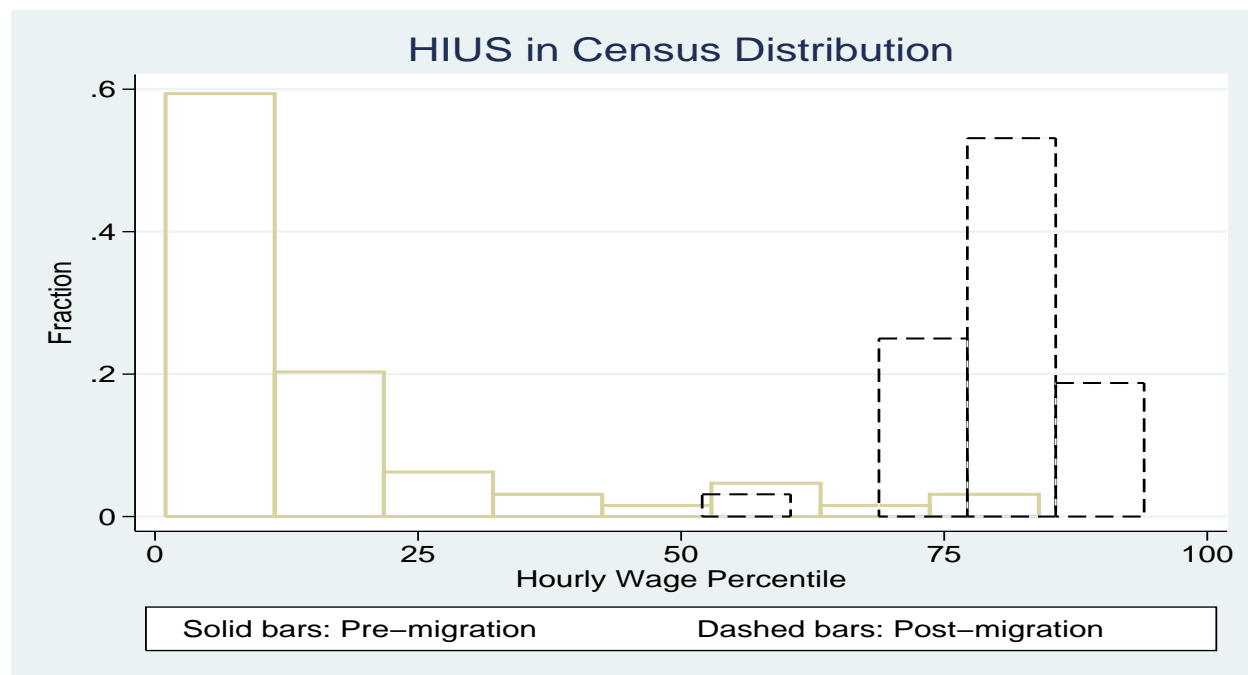


II. HIUS

HIUS migrants come from an assortment of origin wage distributions, spread across 14 municipalities in 8 different Mexican states. Figure 11 summarizes the relative gains for all HIUS migrants across all represented municipalities, although migrants are placed in the respective origin wage distributions separately in order to arrive at the displayed percentiles. HIUS migrants come disproportionately from the lower deciles of the various Census wage distributions, starting from relatively disadvantaged income positions even more than HIMEX migrants. However, movements within the origin wage distributions are quite similar to those of the HIMEX counterparts; HIUS migrants move to the upper deciles of the Census wage distributions, with slightly greater variation in percentile outcomes than HIMEX migrants. HIUS migrant pre-migration wages are spread between the 1st and 84th percentiles of the respective Census wage distributions, the average coming from the 15th and the median from the 9th; post-migration wages fall between the 52nd and 94th percentiles of Census wages, the average falling in the 79th and the median in the 80th. These dramatic changes result in the average HIUS migrant jumping over 64 percent of the population

within the origin wage distribution upon migrating.

Figure 11



3. Are migrants better off after migration?

Clearly migrants are benefitting from large wage gains; however, income gains do not necessarily translate into a higher level of overall well-being. Costs of migration, both financial and any costs related to a preference for places of origin, cut into the income gains that migrants enjoy, but migrants may also change the relevant group of reference upon migrating or over time as adaptation to the place of destination occurs, this possibility examined recently in Stillman et al. (2012). If the reference group changes, even a higher level of objective well-being (income gains net of any migration costs) could result in a lower level of subjective well-being if migrants now compare their respective situations to the incomes of the destination community that are generally higher than those of the community of origin. While revealed preference suggests that migrants are better off after migration, Bartram (2011) argues that migration results in seemingly paradoxical lower

levels of well-being. However, Stillman et al. (2012) challenges this conclusion, emphasizing clear higher levels of objective well-being yet complex and conflicting results within subjective well-being.

Unfortunately, given the nature of the potential costs of migration, measuring the wage gains to migration is an easier task than measuring the costs. It is nearly impossible to quantify any cost related to differences in language and culture or a preference for place of origin; however, my survey data provides a glimpse as to the large portion of the migration cost related to the actual trip. The actual cost of the migration trip itself averages P\$2249 for HIMEX migrants and P\$2570 for HIUS migrants.¹⁵ This cost includes and is often dominated by the frequent cost of the hired *coyote*, responsible for facilitating the border crossing of undocumented migrants.¹⁶ This up-front cost to migration is certainly large, often requiring borrowing to finance the expense, especially given the origin income levels of the migrants entering the samples. The substantial average costs are equivalent to between 9 and 11 months income for an individual hovering at the Mexican poverty line of \$1904 pesos per month. However, Table 3 provides a contrasting perspective, arguably signaling that this cost is not as large as first appears. Given cost of migration c_i and wage difference D_{Wi} , I calculate the number of hours of work required for each individual migrant to “break even,”

$$E_i = \frac{c_i}{D_{Wi}}. \tag{3}$$

Table 3. Break-even hours

	Mean	Std. dev.	Median	Min./max.
HIMEX				
Break-even hours $\left(\frac{c_i}{D_{Wi}}\right)$	362.40	194.43	341.11	36.50/1104.62
HIUS				
Break-even hours $\left(\frac{c_i}{D_{Wi}}\right)$	531.68	325.58	455.44	39.50/2017.49

¹⁵In all reported statistics related to cost and the subsequent break-even hours, I do not include observations for migrants reporting a total cost of \$0.

¹⁶While interviewees are not explicitly asked about legal status or the use of *coyotes*, many volunteer information, detailing both the cost of the *coyote* as well as the total cost of migration.

Assuming a 40-hour workweek, the average HIMEX migrant breaks even near the beginning of the ninth week of work, while the average HIUS migrant must wait until the thirteenth week. In turn, objective well-being is clearly increased through migration, unless those uncaptured recurring costs of migration related to preference for place of origin surpass the remaining wage gains during the first year of migration and also year after year if the migrant prolongs residence in the destination community. While impossible to rule out given lack of data on the other costs of migration, the possibility of a net loss does not appear to be a likely occurrence, as this would require those other costs of migration to average a minimum of P\$8737 and P\$5576 for HIMEX and HIUS migrants per year, respectively, given the average break-even hours and wage gains for each group.¹⁷

With apparent gains in objective well-being in hand, the last question of my household survey allows for the examination of the subjective well-being of migrants, as well as insight on the relative importance of absolute versus relative gains. “Knowing what you do today, would you choose to migrate if you had the decision to make again?” was asked of every survey participant as a wrap-up question to the interview.¹⁸ In turn, examining the various possible outcomes related to this question, partially dependent on whether migrants update the reference group to the destination community or hold on to the community of origin, allows for inference on the subjective well-being of migrants and further exploration of absolute versus relative gains from migration.¹⁹

Given that all migrants in the HIMEX and HIUS samples experience both absolute and relative gains (relative to the origin community), if “no” is the chosen answer, only two options exist: (1) the costs of migration are so great that they outweigh the absolute and relative wage gains, or (2) the migrant is indeed updating the reference group and suffering a worse relative standing within

¹⁷This requirement is conservatively calculated with the first year of migration in mind, when costs are highest due to the cost of the actual trip, c_i ; I assume a 40-hour workweek and 40 weeks of work per year, allowing for periods of unemployment. Given the averages of break-even hours, this means that HIMEX and HIUS migrants have 1237.6 and 1068.32 hours, respectively, left over to cover any uncaptured costs of migration before experiencing zero net gains.

¹⁸While reporting responses beyond the yes/no answers is outside the scope of this paper, this question resulted in much of the most interesting information that the interviewees shared with me, as many migrants expressed strong mixed feelings on migration related to (dis)advantages of the communities of origin and destination.

¹⁹It is clearly possible that migrants may have hybrid reference groups, some mixture of both destination and origin communities, however I assume away this possibility in the following discussion for ease of exposition.

the relevant community overshadows the large absolute gains from migration. If the answer is “yes,” one of three explanations must hold for each migrant: (1) updating of the reference group occurs and relative position worsens, however the absolute gains are large enough to outweigh the relative losses, (2) updating of the reference group occurs and relative position improves, adding extra benefit to the absolute gains, or (3) no updating of the reference group occurs, leaving the absolute gains and improved position relative to the origin community.

Exploring the evidence further, even though every single migrant sampled experiences post-migration absolute wage gains and improved position relative to the origin community, migrants are generally worse off post-migration relative to the US destination community than in the Mexican origin community pre-migration. Using the corresponding Public Use Microdata Areas (PUMA) from 2011 American Community Survey data as the relevant US destination community, the average HIUS migrant falls 8 percentiles in the wage distribution to the 7th percentile. This average disguises a considerable range of outcomes, spread from gains of 11 percentiles to losses of 72 percentiles, associated with relative positions ranging from the 1st percentile to the 39th in the US PUMA wage distribution. With 86% of HIUS answers and 91% of HIMEX answers “yes,” option (2) can be eliminated as a general explanation; either absolute gains outweigh the relative losses (if reference groups are updated) or migrants overwhelmingly are not updating reference groups. However, it should be pointed out that even though worse relative position in the destination community does not appear to be a deciding factor, a larger fall in relative position may contribute to “no” answers, as a t-test for differences in changes in relative positioning is statistically significant at the 5% level when comparing the “yes” and “no” responders. Although both groups lose in relative position on average, the “no” responders fall an average of nearly 17 percentiles more than “yes” responders.²⁰

Further insight is provided by examining how the answers relate to the size of wage gains and length of time since the migration occurred. Intuitively, one clearly expects subjective well-being

²⁰These ideas provide clear avenues for future research, however further data is clearly required in order to reach definitive conclusions.

(the probability of a “yes” answer) to be increasing in the size of absolute and/or relative wage gains. As far as the length of time, it is not clear whether a longer time at destination would translate into a higher or lower probability of higher subjective well-being; as migrants spend more time in the destination community, it is more likely that they update the reference group to the destination, giving a higher group of incomes with which to compare relative position, however the very fact that more time has been spent since migration could be a kind of selection in the sense that only the most satisfied migrants remain in the destination community for longer periods of time.

Looking to the data, Table 4 summarizes a comparison of the three main measures of wage gains (without costs) between the migrants answering “yes” and those answering “no” in each sample. I report the difference in means (the means of “no” responders subtracted from the means of “yes” responders) and the standard deviation of wage differences, wage ratios, and percentile changes within the origin wage distributions, as well as the t-statistics, checking to verify if the two groups exhibit statistically significant differences in wage gains. While HIUS migrants certainly provide evidence in favor of the hypothesized positive association between wage gains and subjective well-being, with statistically significant positive differences in means at the 5% level for both wage differences and percentile changes, HIMEX does not signal the same. Differences in means, while not statistically significant, are actually negative for all three measures, with the unexpected result that migrants answering “no” experience more wage gains on average than the rest of the sample. On the other hand, the very reason for separating the HIMEX and HIUS samples in reporting results, the difference in geographic location of the interviews, may suggest a reason for the HIMEX negative differences in means. The HIMEX sample includes return migrants, who may have achieved relative success through migration and already reached a target goal allowing them to return to the place of origin. If this is indeed the case, some may be unduly influenced by this fact in answering the question as to subjective well-being, given that the return decision was previously made, thereby leading to “no” responders being among the most successful as far as gains from migration.

Table 4. Wage gains and subjective well-being

	Mean	Std. dev.	T-stat
HIMEX			
Wage difference	-0.71	1.01	-0.71
Wage ratio	-1.37	0.77	-1.77
Percentile change (origin)	-10.11	6.76	-1.49
Break-even hours	81.89	64.99	1.26
HIUS			
Wage difference	1.09	0.42	2.60
Wage ratio	1.92	1.44	1.34
Percentile change (origin)	17.82	6.32	2.82
Break-even hours	-354.40	125.66	-2.82

Mean reports the difference in means between the respective values of “yes” responders minus those of “no” responders, while std. dev. is the associated standard deviation. T-stat signals the statistical significance of the differences across the two groups, an absolute value greater than 1.96 being statistically significant at the 5% level.

Switching to net gains, the last row of each section in Table 4 reports the same statistics as those above, however using break-even hours $\left(\frac{c_i}{D_{wi}}\right)$ as the relevant measure of gains from migration. Similar to the wage gains (without costs) story, the HIUS sample supports the hypothesized relationship, showing that “yes” responders have a highly statistically significant lower amount of break-even hours, however the HIMEX sample shows no statistically significant differences, the difference in means being positive (“no” responders have fewer break-even hours than “yes” responders). Table 5 displays a similar comparison between the two groups for the length of time in the destination community (length of time since migration). As expected, these results are even more inconclusive, with neither sample providing statistically significant differences between “yes” and “no” responders.

Table 5. Length of time since migration and subjective well-being

	Mean	Std. dev.	T-stat
HIMEX			
Length of time since migration	-0.74	2.17	-0.34
HIUS			
Length of time since migration	0.98	3.37	0.29

Mean reports the difference in means between the respective values of “yes” responders minus those of “no” responders, while std. dev. is the associated standard deviation. T-stat signals the statistical significance of the differences across the two groups, an absolute value greater than 1.96 being statistically significant at the 5% level.

4. Comparing with an established program of successful development

If we indeed accept migration as not an alternative to economic development, but rather a crucial component of development, it is inevitable to ask how the net gains from migration compare with those of other programs of economic development. In the context of Mexico, one of the programs that has perhaps been deemed as most successful is that of PROGRESA/Oportunidades. With no fewer than 30 countries now adopting and including conditional cash transfer programs such as PROGRESA/Oportunidades as part of social policy, it is no surprise to find a return of over 50 papers from a simple title search on “Progresa” at the online economics database at ideas.repec.org. Behrman et al. (2011) provides a follow-up to previous work analyzing the success of the program in Mexico, estimating the “long-run” costs and benefits to the program based on the return in terms of increased schooling due to program participation, as well as various assumed rates of return to schooling and discount rates. Given the lowest assumed discount rate of 3%, along with the highest assumed return to schooling at 10%, a 9-10 year-old boy starting six years of PROGRESA/Oportunidades participation can expect \$3557 in extra lifetime earnings due to the improved human capital.

While this amount certainly reflects successful outcomes for participants in PROGRESA/Oportunidades, how does it compare to the gains from migration? Even by stacking the deck against migration and employing the highest average break-even hours, 531.68 of the HIUS sample, an astounding result obtains. Converting to P\$, \$3557 becomes P\$5487, meaning that a Mexican migrant would

have to work just over 1000 hours in the United States to match a lifetime of extra earnings from six years of participation in PROGRESA/Oportunidades. Adding this to the work required to recuperate the explicit cost of migration, and assuming a 40-hour workweek, 39 weeks of work in the US surpasses the lifetime net benefits of one of the most successful development programs on record.²¹ While I do not want to suggest a lack of importance of PROGRESA/Oportunidades or any other development program already in place, this stark comparison clearly emphasizes just how powerful a development tool migration has been and could potentially be in the future.

5. *Observable characteristics and (net) gains*

As a final examination of the survey data, I characterize the relationship between relevant observable traits of the migrant samples and the associated (net) gains of migration. In doing this, I focus on education, gender, time since migration, age at migration, and legal migration status, respectively, and the connection with my various measures of (net) gains, i.e. D_{Wi} , R_{Wi} , and $\left(\frac{c_i}{D_{Wi}}\right)$. Further understanding of these relationships is important in attempting to identify if certain types of migrants are relatively more or less likely to enjoy larger gains from migration. While the literature tends to signal potential gains increasing in education, hypothesizing a relationship between education and gains is not straightforward across the varied measures. While it may be reasonable to expect this positive relationship to hold when using D_{Wi} as the measure of gains, it is also easy to imagine the opposite result if using R_{Wi} , given the fact that individuals with lower education levels tend to have a lower initial wage before migration. Concerning the other observable traits of focus, I refrain from hypothesizing the correlations given similar confounding issues, however emphasize time since migration given a potential concern. In reporting the results of both HIMEX and HIUS samples, I group together individual migrants who have migrated over a considerable span of years. Even though all gains are reported using only wage immediately pre- and post-migration, if gains to migration are consistently increasing (decreasing) over time, it may be more reasonable for purposes of comparison to separate the samples further into subdivisions according to year of migration.

²¹I assume that PROGRESA/Oportunidades entails no cost to the individual participant, intentionally ignoring societal costs in making this comparison. While PROGRESA/Oportunidades clearly has a cost of implementation, it is not clear whether further labor mobility would result in increased or decreased costs to society, due to the many effects on both origin and destination countries of migration. A full analysis of this question is beyond the scope of this paper, however provides a clear avenue for further research.

Table 6. Simple correlations: observable characteristics and gains from migration

	Years of education	Years since migration	Age at migration	c_i
D_{Wi}	-0.16	0.47	-0.02	0.18
R_{Wi}	-0.39	0.07	0.22	0.12
$\left(\frac{c_i}{D_{Wi}}\right)$	0.06	-0.24	-0.01	-

Table 6 details the simple correlations between the selected observable characteristics and the three varied measures of (net) gains for the HIUS sample. Without controlling for other potential determinants of gains, gains from migration are negatively associated with years of education, positively associated with years since migration, and positively associated with cost of migration, the proxy for legal status given the assumption that migration without legal documents results in an increased c_i .²² The relationship with age at migration is unclear, older age negatively associated with the wage difference, while pointing to larger gains using the wage ratio and break-even hours. A t-test separating men and women results in no statistically significant differences across all three measures of gains, men generally enjoying marginally larger gains relative to women. In addition to c_i , I employ voluntarily-reported results on the payment to a *coyote* as an alternative proxy for legal status. This is not an exact measure of legal status because no explicit question as to legal status was included in the household survey, however many interviewees voluntarily offered information on the use of a *coyote* in answering the question on cost of migration. Furthermore, it is also possible that some migrants who cross the border illegally do not employ a *coyote*. Dividing the sample into those reporting the use of a *coyote* (irrespective of reported cost) and those who do not, a maximum t-statistic of 0.94 for t-test on the three measures of gains signals a lack of statistically significant differences between the two groups.

Table 7. OLS regression results

Dependent variable: Covariates	D_{Wi}		R_{Wi}		$\left(\frac{c_i}{D_{Wi}}\right)$	
	Coefficient	Std. error	Coefficient	Std. error	Coefficient	Std. error
Education	-0.03	0.05	-0.47**	0.20	-0.37	16.76
Gender	-0.21	0.28	0.32	1.12	12.50	94.75
Years since migration	0.05***	0.02	-0.00	0.06	-8.88	5.31
Age at migration	-0.00	0.02	0.01	0.07	-0.96	5.97
Cost	0.00	0.00	0.00	0.00	-	-
Constant	4.78***	0.90	6.93*	3.66	631.95**	296.35
R^2	0.27	-	0.17	-	0.06	-

*, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

²²The positive association with cost of migration is expected, as this association does not include net gains. This can be translated as higher wage gains needed to compensate the migrant for a higher migration cost.

The OLS regression results detailed in Table 7 provide an alternative perspective as to the relationship between the selected observable characteristics of migrants and their gains from migration. General positive (negative) associations reflect the correlations detailed in Table 6, however the estimates are plagued by a lack of statistical significance, only years since migration and education being statistically significant at the 10% level for D_{Wi} and R_{Wi} , respectively. In summary, while being less educated, being male, and having migrated a longer time ago appear to be associated with larger gains from migration, the evidence on specific determinants of these gains is rather inconclusive for the HIUS sample; nearly all estimates reflect statistical insignificance.

IV. Conclusion

In answering the three central questions stated in the opening section of this paper, the results tell an overwhelmingly straightforward story. With minimum average wage ratios of 3.92 across all examined samples, migrants are experiencing large wage gains by crossing the Mexico-U.S. border. HIMEX and HIUS migrants gain an average of P\$7.06 and P\$5.22 per hour worked, and enjoy average wage ratios of 5.24 and 5.56, respectively. Even given the explicit cost of migration that cuts into these wage gains, HIMEX and HIUS migrants need only an average of 362 and 521 hours of work in the U.S., respectively, before experiencing outright positive gains. 100% of the approximately 30% of HIMEX migrants starting below the Mexican poverty line make the jump out of poverty by relocating, even when measured by the more stringent U.S. measure of the poverty line; only 2 of the 60% of HIUS migrants moving away from poverty in Mexico remain impoverished by U.S. standards. It is indeed difficult or nearly impossible to find evidence of (or even imagine) a specific program of economic development with a success rate similar to that of migration found in this paper; what program can claim such success stories as pulling all impoverished individuals out of poverty (HIMEX) or increasing participants' incomes more than fivefold on average (HIMEX and HIUS)?

In addition to the absolute wage gains, migration also translates into large movements in migrants' relative positions within the origin wage distributions. Before migrating, the average HIMEX migrant resides at the 38th percentile of the origin wage distribution, moving to the 84th percentile immediately after migration; the average HIUS migrant moves from the 15th to the 79th percentile. Upon migration, HIMEX migrants on average pass 52% of the population in the respective origin wage distribution, while HIUS migrants advance past an astounding average of 64% of the relevant reference population. Furthermore, while 70% of HIMEX migrants and 91% of HIUS migrants have pre-migration wages below the corresponding median income, 100% and 34% rise to the very top of the origin wage distributions, jumping to the highest two deciles immediately after migration.

With these impressively large documented gains available to migrants willing and wanting to move across the border, especially as governments either seek to further limit international migration or discuss options for alternative immigration schemes around the world, further examination of the effects of these policies and complete understanding of the motivation for and determinants of migration is essential.²³ In focusing on the economic development consequences of migration, the effect of migration on migrants themselves - perhaps the most important effect of all - must not be forgotten and pushed behind other themes such as effects on sending or receiving countries in the international migration and economic development research. Letouzé et al. (2009) states "...that migration is not an important contributor nor hindrance to development...best seen in terms of the expanded opportunities it offers individuals to carry out their life plans." However, viewed through the lens of this paper's shifted focus of development on people rather than places, migration not only expands opportunities, those very expanded opportunities contribute greatly to what the definition of economic development should be all about.

²³See Good (2013) for an example of immigration policy affecting migrant decisions, specifically an analysis of how recent state-level immigration legislation in the US has affected internal migration responses.

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