Research Article
Beyond Networks: Health, Crime, and Migration in Mexico

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Two rounds of a longitudinal survey from Mexico, representative at the national, urban, rural, and regional level, are used to examine the determinants of local, domestic, and international migration. Aside from the typical covariates in the migration decision, this study considers health conditions, crime, and individual's perspectives on life as explanatory variables. Coefficient estimates for most health variables do not offer significant support to the healthy migrant hypothesis. In terms of crime, the results suggest that females respond to worsening safety conditions in Mexico by migrating domestically, but not abroad. The decision to migrate domestically or abroad for males is not statistically correlated with increases in crime. Overall, having access to international migration networks continues to play a significant role in the decision to migrate to the US.

1. Introduction

Migration within the country and abroad has been a persistently important phenomenon in Mexico. According to Mexico's National Institute of Statistics, Geography, and Information (INEGI), census data from 2010 show that around 20% of residents lived outside their state of origin, and this rate was significantly higher than that in 2000. In terms of international migration, INEGI statistics since 2005 show that more than 1 in 10 individuals born in Mexico was residing in another country and this rate was considerably higher than in 1990 (around 1 in 20).

Until the middle of the 1960s, migration within Mexico was characterized by a flow of migrants mainly from poor rural areas of the center and south regions towards Mexico City and to other large urban areas across the country. These flows were motivated mainly by higher employment opportunities and better wages. Driven by trade liberalization reforms in the 1960s, migration flows within Mexico switched direction toward northern cities along the US-Mexico border, areas receiving significant foreign investment flows mainly in the form of assembly maquiladora factories, which attracted mainly young single females [1, 2]. In the 1990s and driven in part by Mexico's drastic shift toward globalization due to the implementation of NAFTA, migration flows towards large

cities along the US border intensified along with migration to the US. This was particularly prevalent for rural communities that relied heavily on basic crops production and were unable to compete with international markets [3].

In terms of international migration, INEGI census data from 2000 show that more than 95% of international migrants from Mexico were migrants to the US. In addition, Mexico's international migration flows since the 1940s, during the second wave of the Bracero program, have been dominated by a handful of states (There are 31 states and 1 federal district in Mexico. The Bracero program was an agreement between the US and Mexico that gave temporary work visas to Mexican workers to address US labor shortages in railroads and farms mainly in the south and west.). At this time, most migrant workers to the US came from bordering states like Coahuila, Chihuahua, and Nuevo Leon, but mostly from the central states of Aguascalientes, Guanajuato, Jalisco, Michoacán, San Luis Potosi, and Zacatecas [4] (The author estimates this using the number of money orders remitted from the US to each individual state in Mexico.). Not surprisingly, more recent data show that the latter states currently account for more than two thirds of all migrants to the US [5]. However, census data from 2000 to 2010 shows that states like Puebla, Veracruz, Guerrero, and Oaxaca, with historically

low international migration rates, are now sending significant numbers of migrants to the US.

Due to the magnitude of this phenomenon, Mexican migration within the country and abroad has been studied extensively. For the most part, empirical studies on migration can be divided into two categories: those that consider the determinants of migration and those that consider the impact of migration on the receiving communities, the sending families, and their communities of origin. The literature on the determinants of migration tends to analyze the migration decision as an individual's rational decision motivated primarily by expected net income gains [6–9]. In this neoclassical model of migration, the migration decision model is one in which the potential migrant considers the earnings differential, net of migration costs, from migration. Correspondingly, the individual decides to migrate if the net wage differential is positive. Some researchers depart from this individualistic approach and model the migration decision as a collective household risk-minimization strategy [10–12]. However, this approach remains focused on labor market outcomes and wage gains as the main determinants of migration.

The neoclassical approach suggests that individual and family socioeconomic and demographic characteristics, being related to earnings potential, determine in part the benefits and costs of the migration decision. However, having access to migration networks, the individual's health status and people's attitude toward crime and insecurity have also the potential to alter these benefits and costs and ultimately the outcome from the migration decision.

This study considers the individual local, domestic, and international migration decision using two rounds of a nationally representative survey in Mexico. This survey is longitudinal and multithematic and follows individuals across round including those who migrate within Mexico or emigrate to the US. Consistent with the majority of the migration literature, the migration decision in this study considers individual and family socioeconomic and demographic characteristics as well as variables related to access to migration networks. In addition, the health status of individuals, crime measures, and residents' perspectives on life are also considered as part of the decision to migrate within Mexico or abroad. To control for the potential endogeneity of migration networks, the distance from the municipality of residence to the nearest railroad station along the Mexico-US route is used as an instrument.

The main statistically significant results indicate that females diagnosed with heart conditions are more likely to migrate, while males diagnosed with hypertension are more likely to migrate to the US, giving no support to the healthy migrant hypothesis. In terms of crime and violence, females that live in a household where at least one member has been a victim of robbery or other more serious crimes are more likely to migrate to another municipality or state, but not to the US. Individual past and future perspectives on life are not statistically correlated with domestic or international migration for both males and females. Finally, the extent of international migration networks in the municipality continues to be highly correlated with the decision to migrate to the US.

2. Networks, Health, Crime, and Migration

Data collected in Mexican communities with historically high international migration rates suggests that different fundamental forces are at work in promoting Mexican migration abroad [13]. Macroeconomic variables, like the real interest rate in Mexico and whether or not the individual lives in an agrarian community, are strong predictors for first trip migration to the US for undocumented workers. There is also empirical evidence that single men with low levels of education are more likely to migrate to the US, while married, higher education individuals are more likely to migrate within Mexico [14].

At the community level, it has been found that cities with the highest employment rates in Mexico tend to have less outmigration and more domestic inmigration [15]. Aguayo-Tellez [5] found that the percentage of communal land and maquiladora employment also drive internal migration in Mexico. On the other hand, communities that rely heavily on basic crops production tend to have significantly higher rates of migration to the US [3]. At the macro level, Hanson et al. [16] find strong negative relation between Mexican wages, border enforcement, and US migration. The migration literature has also found strong positive correlations between migration and macroeconomic variables such as GDP growth in Mexico and Peso devaluations [17].

At the same time, a large majority of the literature on the determinants of migration agrees on the relatively high importance of having access to migration networks on the decision to migrate, especially to another country [3, 18]. Furthermore, several studies have found that having access to migration networks is the most important predictor of international migration, particularly for undocumented migrants [19–21]. Access to migration networks is typically defined as being related to or knowing a migrant or living in a community where migration is significantly prevalent. Networks are important because they might provide direct assistance in the form of food, housing, and transportation and they might also provide valuable information about job opportunities and safety information when crossing the border [22]. Consequently, international migration networks might lower the costs and increase the probability of success for all migrants, especially for people in the lower portions of the income distribution. McKenzie and Rapoport [23] show that the probability of migration is increasing with educational attainment in communities with low migration networks, but decreasing with education in communities with high migration networks. This might explain in part why some authors find positive selection of migrants based on education while others have found evidence of negative selection.

However, there is a concern that the extent of migration networks in a community might be endogenous and therefore create an econometric problem if used as a covariate to predict migration. For example, harsh economic conditions might promote migration and the creation of networks, but

these conditions might continue to induce outmigration. If ignored, empirical studies on the determinants of migration might lead to spurious findings on the effects of networks on migration according to McKenzie and Rapoport [23].

Another standard proposition in the migration literature is that migrants tend to be favorably self-selected for labor market success. They tend to be on average more able, ambitious, entrepreneurial, and aggressive than individuals who choose to remain in their communities of origin [24]. Migration, as a rational decision made by migrants or their families, is likely to be favored by individuals with relatively low costs and high benefits from migration. Aside from the typical factors in the neoclassical model of migration, health conditions and people's perspectives on life have the potential to alter the costs and benefits in the migration decision.

The healthy migrant hypothesis suggests that healthy individuals are more likely to migrate because good health can increase the migrant's earnings potential, increase the probability of success, and lower the costs of migration [25]. Plenty of empirical studies provide support regarding a health advantage for Mexican migrants in the US [26–32]. Empirical studies on the potential health selectivity of migrants before or at time of migration also tend to provide support for the healthy migrant hypothesis. For example, some empirical studies report that male migrants are relatively less likely to be overweight than nonmigrants [33]. The authors report also that female migrants are taller and more likely to have good levels of hemoglobin than nonmigrants. Riosmena et al. 2013 [34] found strong immigrant advantage relative to non-Hispanic Whites in hypertension and they also found evidence of migrant positive selection in height and self-rated health.

With respect to crime, several empirical studies have analyzed the relationship between crime and migration [35]. According to the literature, moving away from high crime areas has the potential to significantly increase the benefits from migration, making it certainly a more attractive option [36]. Empirical studies have shown that country-wide conflicts like the Cuban revolution and military takeovers in South America typically result in migration abroad, while localized areas of crime and violence lead to internal migration [37–39]. Ibáñez and Vélez [38] find evidence that crime and violence forced Colombians to migrate within the country, while Rodriguez and Villa [40] find evidence that the risk of kidnappings motivates households to send some of their members abroad. Recently in the US, the news media has reported extensively on the relatively recent outmigration of upper-middle and high income migrants from Mexico, the so-called "narco-refugees." Members of these groups are allegedly driven out by drug violence and lack of security in Mexico [41, 42].

3. Materials and Methods

This paper models migration as an individual's decision dependent on several individual, family, and community level characteristics. The dependent variable is a dichotomous measure related to the respondents' migration status relative to their place of residence three years priorly. As part of the emphasis of this paper, the list of covariates includes several individual health indicator variables, family crime victimization measures, individual's perspectives on life, and the extent of international networks in the municipality. The data used in this study comes from two rounds of the Mexican Family Life Survey, a nationally representative survey at the rural, urban, and regional level [43, 44]. This survey is longitudinal and multithematic. In addition, the baseline sample is probabilistic, stratified, multistaged, and independent at every phase of the study. The two rounds of this study (2002 and 2005) contain detailed data on individual, family, and community level characteristics, including gender, age, education, marital status, work, home ownership, health, crime, rural condition, and migration. The panel nature of the dataset allows for the identification of migrants between rounds (The recontact rate for the second round is of around 90 percent, including international migrants. Households that migrated as a whole are typically not captured in 2005 and are not part of the data.). In addition, the survey allows identification of undocumented international migrants. However, a separate analysis by document status is not permitted due to a significant sample size reduction and a large portion of no responses. One potential limitation of this study is that the dependent variable is measured in relationship to their place of residence only three years prior to the survey. It seems plausible that worsening conditions in terms of health, crime, and perspectives on life might take longer to exert their full influence on people's decisions to migrate to another municipality, another state, or abroad.

The dependent variable and most of the control variables are derived from data collected in 2005, except for health outcomes variables measured in 2002. The main concern here is that there is the possibility that including concurrent health values as covariates in the migration regressions might affect the reliability of these covariates' estimates of their impact on migration. In other words, health status can have an effect on migration, but concurrent health status might be also affected by the migration decision. There is empirical evidence that migration, though it can improve the socioeconomic well-being of migrants, their families, and their communities of origin, can also be detrimental to the health status and emotional well-being of migrants and their families [45]. In this case, the effects of health status on migration might be underestimated. Similarly, individuals might decide to migrate in order to improve their health status. In this case, the effects of health status on migration will be overestimated [46]. To lessen these potential biases, all the health outcome variables are measured as of 2002.

The empirical model to be estimated takes the following form:

$$\Pr\left(\text{Mig}_{ij} = 1 \mid X\right) = \Phi\left(X'\beta\right),$$

$$X'\beta = X_{ij}\beta + Z_j\delta + \text{Health\_Status}(2002)_{ij}\phi \qquad (1)$$

$$+ \text{Crime}_{\text{Security}_{ij}\gamma} + \mu_{ij}.$$

The binary dependent variable takes a value of 1 if the individual changed place of residence by 2005 relative to 2002

and 0 otherwise and Φ represents the cumulative distribution function of the standard normal distribution. Three different specifications of (1) are estimated using different definitions of migration (Based on goodness of fit and Chao tests criteria, the migration decision is also considered separately for domestic and international migration, as well as gender.). The most comprehensive definition considers all types of migration, even within the same locality or municipality. The second definition considers only migration to another municipality or to another state within Mexico and the third one considers migration to the US. One thing to note here is that if migration is driven in part by increases in crime, migrating to another state or abroad might be a more probable response than migrating within the same locality or municipality.

Individual characteristics include, among others, age, gender, educational attainment, and marital status. Family characteristics include family size, home and real estate ownership, health insurance coverage, and reception of government programs aid. Community level variables include rural condition and the percentage of households that reported having migrants to the US in 2000. The latter is intended to capture the extent of international migration networks present in each municipality.

Table 1 presents summary statistics for all surveyed individuals from age 18 to 64 according to their migration status in 2005. The first column presents statistics for individuals who have not changed their place of residence relative to three years previously. The second column represents individuals who changed their place of residence using the most comprehensive definition of migration. The third column represents individuals who changed their place of residence to another municipality or to another state within Mexico. The last and fourth column represents individuals who migrated to the US. The majority of migrants moved within the same locality or municipality. Around 8% of individuals changed their place of residence between 2002 and 2005, close to 2% of individuals migrated to another municipality or state within Mexico, and more than 2% migrated to the US.

Summary statistics in Table 1 show that migrants overall have significantly different characteristics than nonmigrants. Domestic migrants in turn have also some differing characteristics than international migrants. In terms of hypertension, diabetes, and obesity, migrants tend to have lower incidence than nonmigrants, which could be interpreted as support for the healthy migrant hypothesis (BMI is defined as $(weight)/(height)^2$ and individuals with a BMI higher than 30 are classified as obese.). The general health status variable captures respondents' general self-perception of their health status, while the relative health status variable is related to the respondents' health perception relative to individuals in their same age and gender group. Individual responses range from very good or good to bad or very bad. Both variables take a value of 1 if the respondents feel that they are in good or very good health and 0 otherwise. Considering columns 2 and 4, the estimates suggest that only local migrants tend to feel generally in better health than nonmigrants. On the other hand, migrants in general tend to feel less favorably

about their relative health than nonmigrants and this is true especially for migrants to the US.

The next section presents statistics related to crime and life perspectives. Robbery is a dichotomous variable with a value of 1 if at least one family member has been robbed at any time in the 3 years prior to the survey and 0 otherwise. The variable crime is similar to robbery, but it also considers other more serious types of crimes like kidnappings and sexual assaults (Around 92 percent of all crimes reported were robberies; the rest were kidnappings, sexual assaults, and other serious crimes.). Statistics suggest that people in households with victims of robberies or other more serious crimes are more likely to migrate to another municipality or state within Mexico, but not to the US. These statistics are consistent with the literature about the impact of localized areas of crime on migration. The variables Past Perspective and Future Perspective are derived from respondents' perceptions about what has happened or will happen to the general quality of their lives. Individual responses go from worsened somewhat or really worsened to improved somewhat or really improved. These variables take a value of 1 if the respondent feels that life has or will deteriorate significantly in the previous or next 12 months and 0 otherwise. In a sense, these two variables can serve as a proxy for the respondent's degree of pessimism. Overall, individuals who feel more pessimistic are less likely to migrate, which suggests that an overall negative perspective on the quality of life is not necessarily positively related to domestic or international migration.

The last sections of Table 1 present individual, household, and community level characteristics for the different groups. The variable Education Years measures the individual's years of schooling, while the variable Family Highest Education represents the highest educational attainment among household heads (Family Education Years is measured in categories. (1) 0–8 years, (2) 9–11 years, (3) 12 years, (4) 13-14 years, (5) 15–16 years, and (6) 17 years and more.). The variable Activity captures whether or not the individual performs physical activity regularly. Income decile is a measure used to capture differences in relative income. The indigenous variable captures whether or not at least one head of household speaks an indigenous language. Progresa/Procampo is a variable for whether or not any family member receives either of those government subsistence aid programs. Finally and to be consistent with the international migration literature, a measure of the percentage of municipality households with international migrants in the 2000 population census is included. This measure tries to capture the extent of each municipality's international migration networks. To address the potential endogeneity of migration networks, the municipality's distance to the nearest railroad stop along the Mexico-US border route is used as an instrument in all regressions (The intuition is that Mexican migrants' main mode of transportation to the US in the 1910s–1940s was the railroad. Consequently, participation in the first waves of the Bracero program is negatively correlated with the distance to the railroad connecting the central and east regions of Mexico to the US border. At the same time, more recent population census data shows a high positive correlation between the international migration rates and the extent

Table 1: MxFLS 2005 summary statistics.

Category	Variable	Nonmigrant (1)		Migrant (2)		Domestic migrant (3)		International migrant (4)
Health	Heart condition	0.02 (0.14)		0.02 (0.13)		0.02 (0.14)		0.02 (0.14)
	Hypertension	0.10 (0.30)	* * *	0.05 (0.22)	* * *	0.05 (0.21)	* * *	0.05 (0.22)
	Diabetes	0.05 (0.23)	* * *	0.01 (0.11)	* * *	0.00 (0.07)	* * *	0.01 (0.11)
	Overweight	0.66 (0.47)	* * *	0.44 (0.50)	* * *	0.44 (0.50)	* * *	0.44 (0.50)
	Obesity	0.28 (0.45)	* * *	0.12 (0.32)	* * *	0.10 (0.31)	* * *	0.13 (0.33)
	Ulcers	0.07 (0.26)	* *	0.06 (0.23)		0.06 (0.23)		0.06 (0.25)
	General health status	0.44 (0.50)	* *	0.47 (0.50)		0.48 (0.50)		0.42 (0.49)
	Relative health status	0.29 (0.46)	* *	0.26 (0.44)		0.27 (0.44)	*	0.25 (0.43)
Victimization/security	Robbery	0.23 (0.42)	* * *	0.27 (0.45)	* *	0.29 (0.46)		0.20 (0.40)
	Crime	0.24 (0.42)	* * *	0.28 (0.45)	* * *	0.30 (0.46)		0.21 (0.41)
	Past perception	0.03 (0.18)	* * *	0.01 (0.12)	* *	0.01 (0.10)	* *	0.01 (0.10)
	Future perception	0.06 (0.25)	* *	0.05 (0.21)	*	0.04 (0.20)		0.05 (0.22)
Observations		14,877		1,361		292		364
Individual	Age	39.78 (11.88)	* * *	29.41 (8.55)	* * *	29.70 (8.84)	* * *	29.82 (9.28)
	Male	0.46 (0.50)	* * *	0.53 (0.50)		0.49 (0.50)	* * *	0.67 (0.47)
	Married	0.70 (0.46)	* * *	0.66 (0.47)	* * *	0.61 (0.49)	* * *	0.54 (0.50)
	Education years	5.68 (4.07)	* * *	6.77 (4.00)	* * *	6.49 (4.31)	* * *	6.95 (3.39)
	Activity	0.19 (0.39)	* * *	0.23 (0.42)	* *	0.25 (0.43)	* * *	0.25 (0.43)
	Head of household	0.70 (0.46)	* * *	0.17 (0.37)	* * *	0.13 (0.34)	* * *	0.28 (0.45)
Family	Family size	5.43 (2.44)	* * *	6.53 (2.66)	* * *	6.03 (2.30)	* * *	6.65 (2.72)
	Family kids	1.83 (1.62)		1.86 (1.75)	* * *	1.46 (1.59)	* * *	2.28 (1.87)
	Family elders	0.20 (0.48)	* * *	0.29 (0.56)	* * *	0.37 (0.67)		0.22 (0.48)
	Phone	0.50 (0.50)	* * *	0.55 (0.50)	*	0.45 (0.50)	* * *	0.60 (0.49)
	Own house	0.81 (0.39)		0.81 (0.39)		0.78 (0.42)		0.81 (0.40)
	Own real estate	0.19 (0.39)	* *	0.22 (0.41)		0.20 (0.40)	* * *	0.30 (0.46)
	Family education years	2.12 (0.97)	*	2.17 (0.88)		2.20 (0.91)	* *	2.00 (0.83)
	Income decile	5.63 (2.99)	* * *	5.34 (3.11)	* *	5.27 (2.99)	* * *	4.78 (3.04)
	Indigenous	0.12 (0.33)		0.12 (0.32)		0.13 (0.34)	* *	0.17 (0.37)
	Health coverage	0.44 (0.50)	* * *	0.38 (0.49)		0.40 (0.49)	* * *	0.18 (0.38)
	Progresa/Procampo	0.16 (0.37)		0.16 (0.37)		0.18 (0.38)	* * *	0.22 (0.41)

TABLE 1: Continued.

Category	Variable	Nonmigrant (1)		Migrant (2)		Domestic migrant (3)		International migrant (4)
Community	Rural	0.40 (0.49)		0.42 (0.49)	**	0.47 (0.50)	* * *	0.60 (0.49)
	US migrant households	5.67 (6.20)	* * *	6.75 (6.96)	**	4.79 (5.58)	* * *	11.63 (8.20)

Notes: mean group differences relative to nonmigrants (1): $^{***}P < 0.01$, $^{**}P < 0.05$, and $^{*}P < 0.10$.
Health indicators are measured in 2002.

of participation in the Bracero program. However, railroad transportation currently is no longer used for the most part, so it is uncorrelated with current migration decisions, making it a valid instrument for the extent of international migration networks.).

Overall, migrants tend to be younger, are more likely to be male, are less likely to be married or head of household, tend to have relatively lower family income, and are less likely to have health insurance. At the same time, migrants tend to have higher educational attainment, are more likely to exercise regularly, tend to live in larger families, are more likely to own real estate, and tend to live in rural communities with higher migration networks. Some significant differences between domestic and international migrants occur. International migrants tend to live in households with more kids and are more likely to own a phone. As expected, living in a community with significant international networks is positively and significantly correlated only with migration to the US.

4. Results and Discussion

This section presents estimation results for the migration equation (1). The dependent variable captures whether or not individuals changed their place of residence domestically or abroad relative to the first round, the most comprehensive definition of migration. Table 2 presents the results from the migration equation considering health outcome variables. Given the high correlation between some health outcomes, each column represents a different specification using one of the health outcome variables separately. The results in column (4) show that obese individuals are statistically less likely to migrate. For all other health outcomes measures, their correlations with migration are not statistically significant. In other words, health conditions in 2002 for the most part are not significantly correlated with changes of residence in 2005. However, these results might be in part due to the use of the most comprehensive definition of migration.

In terms of the other control variables, being younger, male, married, and having higher education are positively correlated with migration. Heads of households and members of families with kids or elders are significantly less likely to migrate, as well as higher income individuals and those living in families with high educational attainment among household heads. Finally, individuals owning a house have lower probability of migrating, while individuals living in a municipality with access to international migration networks have higher probability of migration.

The results in Table 3 consider indicators of crime and people's perspectives on life as additional explanatory variables for migration. Each different specification considers each of these covariates separately. The coefficients for robbery and other more serious forms of crime are both positive, suggesting that people might respond to increases in crime by changing their place of residence. However, all estimates are all statistically insignificant. Similarly, the positive coefficients for life perspectives suggest that people who feel that life has or will deteriorate significantly are more likely to migrate, but they are both statistically insignificant. Overall, the results so far suggest that safety conditions are not statistically correlated with the decision to migrate. As expected, the coefficients for all other covariates remain practically unchanged from those in Table 2.

The results so far have not shown much support to the proposal that health conditions, crime, and life perspective might play a significant role in the individual's decision to migrate domestically or abroad. As mentioned before, the lack of support might be due to the use of the broadest definition of migration as the dependent variable. It is feasible that migration decisions might be determined differently by health outcomes, crimes, life perspectives, and other covariates depending on the type of migration. For example, people's health conditions might have differential effects on migration depending on whether migration is local, domestic, or abroad. Similarly, people might not respond to increases in robberies and other more serious crimes by migrating to another municipality, state, or abroad, instead of migrating to another place in the same locality. In addition, given that the coefficients on gender are statistically significant, it would be important to investigate the ways in which males and females respond to changes in all observable characteristics, especially for those related to crime, health, and perspective on life. For example, if females are more vulnerable to robberies or other more serious crimes, their families might opt for their migration over the migration of males. Similarly, if males are more likely to migrate to the US illegally, their health status might play a more significant role than for females. Finally, coefficient estimates for health conditions and crime might be expected to differ by gender given the evidence that females tend to migrate more as part of a family than males [47].

As a technical note, presenting all the covariates estimates for the different specifications of the migration decision by gender would result in a large number of tables. Instead, the following tables present only the coefficient estimates for health, crime, and life perspectives variables. All different

Table 2: Probit results: health and migration.

Dependent variable: migrated (+)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Heart Condition	0.280						
	(0.174)						
Hypertension		0.063					
		(0.085)					
Diabetes			−0.153				
			(0.183)				
Obesity				−0.100*			
				(0.054)			
Ulcers					0.010		
					(0.082)		
General health status						−0.029	
						(0.043)	
Relative health status							−0.020
							(0.041)
Age	−0.018***	−0.018***	−0.018***	−0.020***	−0.018***	−0.018***	−0.017***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Male	0.198***	0.199***	0.194***	0.183***	0.195***	0.173***	0.172***
	(0.045)	(0.046)	(0.045)	(0.043)	(0.045)	(0.042)	(0.042)
Married	0.671***	0.671***	0.671***	0.676***	0.671***	0.649***	0.648***
	(0.057)	(0.057)	(0.057)	(0.060)	(0.057)	(0.057)	(0.057)
Education years	0.016***	0.016***	0.016***	0.018***	0.016***	0.017***	0.017***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Activity	−0.020	−0.022	−0.020	−0.014	−0.021	0.006	0.006
	(0.055)	(0.056)	(0.055)	(0.058)	(0.055)	(0.052)	(0.052)
Head of household	−1.358***	−1.358***	−1.356***	−1.371***	−1.356***	−1.331***	−1.330***
	(0.084)	(0.084)	(0.084)	(0.083)	(0.084)	(0.078)	(0.079)
Family size	0.056***	0.056***	0.056***	0.058***	0.056***	0.062***	0.062***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.014)	(0.014)
Family kids	−0.088***	−0.088***	−0.088***	−0.080***	−0.088***	−0.094***	−0.094***
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.021)	(0.021)
Family elders	−0.129***	−0.130***	−0.132***	−0.134***	−0.130***	−0.144***	−0.144***
	(0.048)	(0.048)	(0.048)	(0.046)	(0.048)	(0.046)	(0.046)
Phone	0.071	0.072	0.072	0.070	0.072	0.075	0.073
	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.048)	(0.048)
Own house	−0.126**	−0.127**	−0.127**	−0.129*	−0.127**	−0.139**	−0.139**
	(0.064)	(0.064)	(0.064)	(0.067)	(0.064)	(0.061)	(0.061)
Own real estate	0.052	0.051	0.052	0.048	0.051	0.062	0.062
	(0.053)	(0.053)	(0.053)	(0.061)	(0.053)	(0.052)	(0.052)
Family highest education	−0.062**	−0.063***	−0.064***	−0.078***	−0.063***	−0.071***	−0.072***
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Income decile	−0.029***	−0.029***	−0.029***	−0.036***	−0.028***	−0.030***	−0.030***
	(0.008)	(0.008)	(0.009)	(0.010)	(0.008)	(0.008)	(0.008)
Indigenous	−0.010	−0.009	−0.011	0.010	−0.010	−0.004	−0.002
	(0.077)	(0.077)	(0.077)	(0.073)	(0.077)	(0.076)	(0.076)
Health coverage	−0.034	−0.035	−0.033	−0.076	−0.034	−0.037	−0.038
	(0.052)	(0.052)	(0.052)	(0.051)	(0.052)	(0.047)	(0.046)
Progresa/Procampo	−0.082	−0.083	−0.084	−0.071	−0.083	−0.075	−0.075
	(0.075)	(0.075)	(0.075)	(0.075)	(0.075)	(0.074)	(0.074)
Rural	−0.064	−0.064	−0.063	−0.077	−0.063	−0.068	−0.067
	(0.065)	(0.065)	(0.065)	(0.068)	(0.065)	(0.063)	(0.064)

TABLE 2: Continued.

Dependent variable: migrated (+)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
US migrant households	0.020***	0.020***	0.020***	0.014***	0.020***	0.016***	0.017***
	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)
Constant	−0.692***	−0.689***	−0.703***	−0.545***	−0.692***	−0.665***	−0.684***
	(0.144)	(0.144)	(0.147)	(0.160)	(0.144)	(0.148)	(0.149)
Observations	11,665	11,665	11,665	11,291	11,665	12,961	12,961

Notes: robust standard errors in parentheses. ***$P < 0.01$, **$P < 0.05$, and *$P < 0.1$.
US migrant households is instrumented using distance to nearest railroad stop.
(+) Migrated refers to local, domestic, or international migration.

specifications consider the same set of other covariates as in Tables 2 and 3.

Table 4 presents the coefficient estimates by gender for the health outcomes variables using the different definitions of migration: all migration, domestic migration, and migration to the US. The results show that females with heart conditions are statistically more likely to move in general, but not necessarily to another municipality, another state, or abroad. On the other hand, males diagnosed with hypertension are more likely to migrate, but only to the US. For all other health conditions, the coefficient estimates are not statistically significant for both males and females. In terms of overall health status, migrant males tend to feel in worse health than other comparable males. On the other hand, females who feel in better health than other comparable females are more likely to migrate to the US. This discrepancy between male and female results in terms of international migration is remarkable, but it seems hard to explain. Overall, these results do not provide much support to the health migrant hypothesis, which suggests that Mexican migrants to the US tend to originate from the upper sections of the health distribution.

Table 5 presents now the coefficient estimates by gender for the crime and life perspectives variables for the three different specifications of migration. In terms of robberies and other more serious types of crimes, females seem to respond to worsening safety conditions by migrating to another municipality or to another state, but not to the US. Males, on the other hand, seem to be generally less responsive to worsening safety conditions.âĂň In terms of variables related to individual's perspectives on life, all are statistically insignificant for all different specifications of migration and for both males and females. This suggests that, holding everything else constant, having low expectations about the future conditions does not necessarily lead to more migration within the country or to the US.

One potential explanation for these results might be that crime and feelings of insecurity are widely generalized in Mexican communities, so their residents might feel there is no point in migrating, especially within the same locality, municipality, or state. Another explanation might be that the amount of time between survey rounds is not enough to fully capture the full effect of crime and life perspectives on migration. One last potential explanation, particularly for the international migration decision results, is that there are other covariates playing a stronger role in the migration

decision. Among these, the extent of migration networks seems to be the strongest, and its relative high significance is consistent for both males and females.

5. Conclusions

Using two rounds of a nationally representative survey in Mexico, this study considers different specifications of the individual migration decision using individual, family, and community level characteristics. Aside from the typical covariates discussed in the literature, each specification considers characteristics related to health conditions, crime, and perspectives on life. In terms of health outcomes, the coefficient estimates obtained for the most part do not offer much support to the healthy migrant hypothesis, which suggest that migrants perform relatively well compared to natives because they are positively selected in terms of their health outcomes. In terms of crime, our estimates suggest that females respond to robberies or to other more serious types of crimes by migrating to another municipality or state within Mexico, but not to the US. In terms of US migration, none of the crime variables are statistically significant, suggesting that other factors like the extent of migration networks continue playing a highly significant role in the decision to migrate abroad. Similarly, the estimates for all variables related to people's perspectives on life are statistically insignificant for both males and females and for the different migration specifications. This suggests that individuals' perspectives in life do not play a significant role in the domestic or international migration decision. One potential explanation for these results might be that crime and feelings of insecurity are widely generalized in Mexican communities, so their residents might feel there is no point migrating, especially within the same locality, municipality, or state. Finally and in terms of international migration, having access to significant migration networks continues to play a significant role in the migration decision.

As mentioned before, one potential limitation of this study relates to the period of analysis, which is dictated by the survey years. Since then, Mexico has experienced several events that might have a significant effect on the migration decisions of its citizens. One of them is the worsening conditions in terms of crime and violence in general. In addition, the recent world financial crisis led to almost 5 percent contraction in real GDP and current growth rates

TABLE 3: Probit results: crime and migration.

Dependent variable: migrated (+)	(1)	(2)	(3)	(4)
Robbery	0.072			
	(0.053)			
Crime		0.083		
		(0.052)		
Past perspective			0.028	
			(0.123)	
Future perspective				0.136
				(0.086)
Age	−0.017***	−0.017***	−0.017***	−0.018***
	(0.003)	(0.003)	(0.003)	(0.003)
Male	0.169***	0.169***	0.172***	0.173***
	(0.042)	(0.042)	(0.042)	(0.042)
Married	0.647***	0.647***	0.648***	0.649***
	(0.057)	(0.057)	(0.057)	(0.057)
Education years	0.017***	0.017***	0.017***	0.017***
	(0.006)	(0.006)	(0.006)	(0.006)
Activity	0.003	0.003	0.005	0.005
	(0.052)	(0.052)	(0.052)	(0.052)
Head of household	−1.329***	−1.329***	−1.330***	−1.330***
	(0.079)	(0.079)	(0.079)	(0.079)
Family size	0.060***	0.059***	0.062***	0.063***
	(0.014)	(0.014)	(0.014)	(0.014)
Family kids	−0.091***	−0.090***	−0.093***	−0.094***
	(0.021)	(0.021)	(0.021)	(0.021)
Family elders	−0.145***	−0.145***	−0.144***	−0.144***
	(0.046)	(0.046)	(0.046)	(0.046)
Phone	0.070	0.070	0.073	0.074
	(0.048)	(0.048)	(0.048)	(0.048)
Own house	−0.137**	−0.137**	−0.139**	−0.140**
	(0.061)	(0.061)	(0.061)	(0.060)
Own real estate	0.065	0.065	0.062	0.060
	(0.052)	(0.052)	(0.052)	(0.052)
Family highest education	−0.074***	−0.074***	−0.072***	−0.072***
	(0.024)	(0.024)	(0.024)	(0.024)
Income decile	−0.031***	−0.031***	−0.030***	−0.030***
	(0.008)	(0.008)	(0.008)	(0.008)
Indigenous	−0.004	−0.004	−0.003	−0.000
	(0.075)	(0.075)	(0.076)	(0.076)
Health coverage	−0.040	−0.040	−0.038	−0.035
	(0.047)	(0.047)	(0.046)	(0.047)
Progresa/Procampo	−0.069	−0.068	−0.074	−0.073
	(0.074)	(0.074)	(0.074)	(0.074)
Rural	−0.058	−0.056	−0.066	−0.064
	(0.064)	(0.064)	(0.064)	(0.064)
US migrant households	0.017***	0.017***	0.017***	0.016***
	(0.004)	(0.004)	(0.004)	(0.004)
Constant	−0.697***	−0.699***	−0.688***	−0.690***
	(0.151)	(0.151)	(0.151)	(0.151)
Observations	12,961	12,961	12,961	12,961

Robust standard errors in parentheses. ***$P < 0.01$, **$P < 0.05$.
US migrant households is instrumented using distance to nearest railroad stop.
(+) Migrated refers to local, domestic, and international migration.

TABLE 4: Probit results: health and migration by gender.

Dependent variable: migrated	All	Males domestic	International	All	Females domestic	International
Heart condition	−0.030	0.470	0.114	0.467**	0.176	0.398
	(0.284)	(0.474)	(0.302)	(0.205)	(0.320)	(0.264)
Hypertension	0.184	0.185	0.399*	0.035	0.213	0.112
	(0.142)	(0.318)	(0.208)	(0.097)	(0.137)	(0.183)
Diabetes	−0.168	−0.186	−0.500	−0.102	0.112	0.871
	(0.233)	(−0.403)	(0.308)	(0.261)	(0.376)	(−0.201)
Obesity	−0.020	−0.024	−0.027	−0.141	−0.061	−0.147
	(0.082)	(0.141)	(0.115)	(0.086)	(0.142)	(0.144)
Ulcers	0.026	−0.045	0.006	0.010	0.128	0.178
	(0.130)	(0.269)	(0.197)	(0.108)	(0.180)	(0.194)
General health status	−0.004	0.011	−0.081	−0.064	−0.059	−0.027
	(0.059)	(0.103)	(0.080)	(0.064)	(0.099)	(0.087)
Relative health status	−0.125**	−0.009	−0.169*	0.081	−0.008	0.218**
	(0.063)	(0.088)	(0.097)	(0.061)	(0.082)	(0.098)

Notes: robust standard errors in parentheses. **$P < 0.05$, *$P < 0.1$.
US migrant households is instrumented using distance to nearest railroad stop.

TABLE 5: Probit results: crime and migration by gender.

Dependent variable: migrated	All	Males domestic	International	All	Females domestic	International
Robbery	0.081	0.122	−0.018	0.072	0.284***	−0.099
	(0.059)	(0.102)	(0.087)	(0.071)	(0.109)	(0.137)
Crime	0.098*	0.105	−0.018	0.075	0.273**	−0.113
	(0.059)	(0.103)	(0.085)	(0.071)	(0.109)	(0.139)
Past perspective	0.029	−0.034	−0.330	0.040	0.025	−0.295
	(0.156)	(0.302)	(0.280)	(0.196)	(0.392)	(0.402)
Future perspective	0.128	0.203	0.059	0.145	−0.030	−0.054
	(0.125)	(0.199)	(0.162)	(0.119)	(0.192)	(0.213)

Notes: robust standard errors in parentheses. ***$P < 0.01$, **$P < 0.05$, and *$P < 0.1$.
US migrant households is instrumented using distance to nearest railroad stop.

barely surpass 1 percent. Not surprisingly, income inequality has grown significantly in Mexico in recent years.

One of the policy implications of the main results in this study is that the continuing deterioration of security in Mexico is expected to lead to more migration within the country, especially among women. Migration abroad, on the other hand, will continue to be driven mainly by age, marital status, family income, and, more importantly, by the presence of international migration networks. An extension of this work will consider not only the correlation between crime and the migration decision, but also the migration destination. For example, if crime is leading to more migration within the country, to what extent are migrants choosing destinations with significantly lower crime incidence.

Conflict of Interests

The author declares that there is no conflict of interests regarding the publication of this paper.

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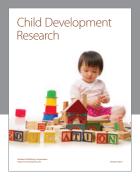[44] L. Rubalcava and G. Teruel, *User's Guide for the Mexican Family Life Survey Second Wave*, 2008.

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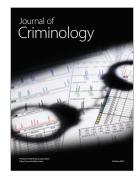[47] J. Martinez, "Mexican migrants to the U.S.: an alternative methodology," *Ensayos Revista de Economía*, vol. 32, no. 1, 2013.