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Regional Economic Analysis of Internal Migration in Mexico

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Abstract

This paper studies how internal migration responds to trade openness. We seek to answer the following questions: Has trade liberalization changed the internal-migration pattern? And second, what characteristics facilitate or hinder that internal migration? Using a gravity model of migration, we find that while economic growth from trade openness did draw workers to urban regions in the northern Border States of Mexico after NAFTA, much of the trade-driven migration occurred earlier after Mexico joined the GATT. We also find evidence that migration to the United States increased after NAFTA, but that income disparity in recipient regions deters migration.

Keywords: Migration, Trade, Policy and Practice, Mexico.
JEL Classification: F16, N76, N96, O15, R23.

Resumen

Este trabajo estudia cómo la migración interna responde a la apertura comercial. Tratamos de contestar las siguientes preguntas: ¿Ha cambiado la liberalización del comercio el patrón de migración interna? Y en segundo lugar, ¿cuáles son las características que facilitan o dificultan la migración interna? Usando un modelo gravitacional de la migración, encontramos que el crecimiento económico de la apertura comercial jaló a los trabajadores a las zonas urbanas en los estados fronterizos del norte de México después del TLCAN; que la mayor parte de la migración impulsada por el comercio se produjo antes del TLCAN. También encontramos evidencia de que la migración a los Estados Unidos se incrementó después del TLCAN, pero que la disparidad de ingresos en las regiones receptoras desalienta la migración.

Palabras clave: migración, comercio, política y práctica, México.
Clasificación JEL: F16, N76, N96, O15, R23.

Regional Economic Analysis of Internal Migration in Mexico

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Abstract

This paper studies how internal migration responds to trade openness. We seek to answer the following questions: Has trade liberalization changed the internal-migration pattern? And second, what characteristics facilitate or hinder that internal migration? Using a gravity model of migration, we find that while economic growth from trade openness did draw workers to urban regions in the northern Border States of Mexico after NAFTA, much of the trade-driven migration occurred earlier after Mexico joined the GATT. We also find evidence that migration to the United States increased after NAFTA, but that income disparity in recipient regions deters migration.

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1. Introduction

Trade causes growth in some industries and regions and contraction in others. For people to be able to benefit from trade, they need to be able to migrate to those areas where new jobs are being created. However, much of the internal migration literature has failed to find a significant impact of international trade on internal migration. Only a limited number of papers study how internal migration responds to international trade (Aroca, et al., 2005; Aguayo Tellez, 2005). In previous work, we show that the North American Free Trade Agreement (NAFTA) has increased regional disparities in Mexico, which might be mitigated through internal migration. In this chapter, we ask whether migration has increased in response to increased U.S.-Mexico trade, and explore those factors that facilitate and hinder labor mobility.

Employment associated with the U.S. market has long been a draw for Mexican workers. In 1965, the United States unilaterally ended the *Bracero* program, which had allowed Mexican workers into the United States for short periods as temporary farm labor.[2] To create jobs for former *Bracero* workers and their families who had moved to the border area the Mexican government established the *maquiladora* program to attract foreign direct investment. This *maquiladora* (or foreign-owned assembly plant) industry is the largest industry on the Mexican side of the Mexico-US border (Canas, et al., 2011; Martin, 2002). *Maquiladoras* are normally owned by foreigners that import raw material and components duty-free to Mexico, assemble them into finished goods and send them back to the United States (Martin, 2002). *Maquiladoras* attract people, especially women[3], from the interior of

[2] Under the Bracero program, Mexicans were given renewable six-month visas to work for approved agricultural growers, located mostly in the southwestern United States (Durand, et al., 2001 p. 110).

[3] In 2000, 60 to 70% of the assembly-line workers in the maquiladoras were women (Martin, 2002)

Mexico to the border to work (Cravey, 1998). The *maquiladora* effect in terms of employment and exports is shown in Table 1.

Table 1 Maquiladora Employment and Exports: 1965-2000

Year	Maquiladoras	Employment	Exports ($mil)	Exports (%)	Wage and Benefits Paid
1965	12	3,000			
1970	120	20,327	83	6	
1975	454	67,213	332	11	194
1980	578	119,546	772	5	456
1985	789	211,968	1,268	6	540
1990	1,924	472,000	3,635	14	
1995	2,206	674,692			
2000	3,900	1,400,000			

Source: (Martin, 2002 p. 124)

As with the maquiladoras before, NAFTA was expected to generate employment in Mexico by attracting investment to produce exports for the United States (Martin, 1993). However, migration specialists predicted that labor movement from Mexico to the United States would not decrease with NAFTA. In fact, in the first decade of the agreement, experts predicted that it would actually *increase*, as the large number of Mexicans displaced by economic restructuring would lead temporarily to more migration to the United States, creating a "hump" of migration (Audley, et al., 2004). There is also literature on credit constraints and migration, where it is shown that the poorest people have low migration propensity because they cannot finance a migration (Phan, et al., 2010).

Looking at raw migration data, from 1990 to 2000 internal migration increased slightly after NAFTA. Although the percentage of migrants decreased from 4.9% to 4.2%, due to the fact that total population increased more than total migration, the number of internal migrants increased from 3,477,237 to 3,584,957. The more substantial shift was in the locations to which people were migrating. The northern Border States had 710,249 in-migrants in 1990, 20% of the total migration, but in 2000, these states had 811,815 in-migrants, or 23%. Of the total migration, the central states (D.F. & Mexico) saw an opposite effect: a small decrease in in-migrants that went from 1,086,305 (31% of the total migration) in 1990, to 1,064,694 (30%) of the total migration. This evidence conforms with Krugman & Livas-Elizondo (1996) that increased trade can lead to dispersion of economic activity and migrants out of Mexico City and into the northern Border States.

Figures 1 and 2 show the net migration in 1990 and 2000, respectively. The black color shows states that are net receivers of migrants, whereas the white color is net senders. The darker colors denote the states with higher percentages of migrants that arrived, whereas the lighter colors denote the states with higher percentages of migrants that left. The percentage is based on the total number of internal migrants that changed residence 5 years before that year.

As observed, the D.F., Veracruz and the southern states (Guerrero, Oaxaca and Chiapas) are the main source of migrant workers. Veracruz increased its out-migration from 4% in 1990 to 6% in 2000. The main receivers are the states surrounding the D.F. (Mexico and Morelos), all the northern Border States, except for Coahuila, and the touristic state of Quintana Roo. Since NAFTA, many industries decided to relocate in the state of Mexico and the northern Border States. Hanson (1998a) argues there has been a cluster of economic activity created along the U.S. border, especially in the manufacturing sector, which has led to the decline of Mexico City's manufacturing belt since the mid-1980s. Firms facing overcrowding and congestion in Mexico City relocated to nearby states (Rodríguez-Pose, et al., 2005). As a result, many people are leaving Mexico City and relocating to states that have increased significantly their economic growth during this decade. Thus, trade leads to more migration because the U.S. market appears to be increasing in importance, whereas the domestic market represented by Mexico City is perhaps less important after NAFTA.

Another reason for this increase of migration to regions with high economic growth is the concept of churning (i.e., young and fast-growing firms get involved in a process of hiring and laying off workers, through new plants created, closed, and employment change). Normally this process begins with the labor market inside the region, but eventually these same firms start attracting migrants from other regions. Regions involved in a high level of churning are mainly the ones receiving most of the internal migration (Hamalainen, et al., 2004; Harris, et al., 2005).

We also observe regional churning of migrants in some of these states. These are regions showing large numbers of in and out-migration, which is the main channel of adjustment of labor markets (Duranton, 2007; Blanchard, et al., 1992). These states show low levels of net migration, or close to zero, but inside the state there is high migration churning. In 1990, some of these states are Puebla, Jalisco, Guanajuato, Michoacán, Oaxaca and Veracruz, and in 2000, Puebla, Jalisco, Michoacán, and Sinaloa (see Table 3 and 4 in the appendix). Aguayo(2005) explains that these regions experience more churning because individuals in rural communities were more exposed to land reform allowing them to migrate internally.

Figure 1: Net Migration 1990

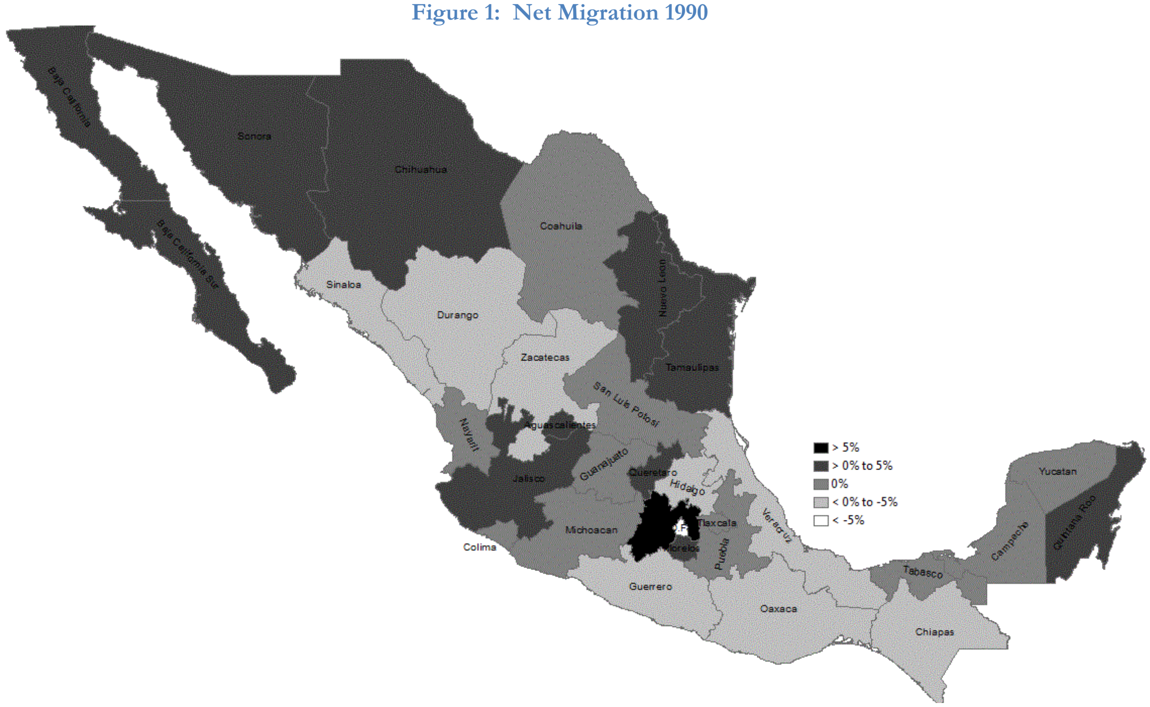
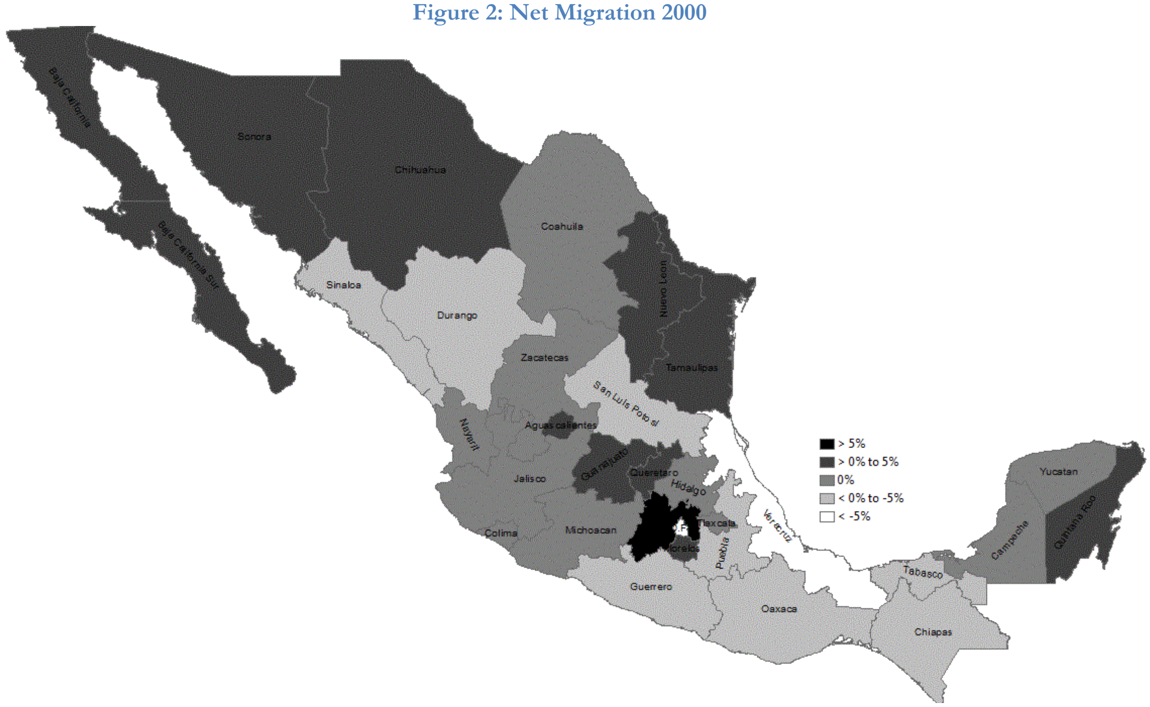


Figure 2: Net Migration 2000



Source: INEGI (2005) and author's calculation. Light colors represent low net immigration and dark colors high.

Despite the importance of flexible labor markets for distributing gains from trade, the migration literature has not given much attention to the relationship between trade and internal migration (Borjas, 1999). Therefore, the main question this essay addresses is whether or not trade liberalization changed the internal-migration pattern, and second, whether migration characteristics such as ethnicity, education, population, land, etc. facilitate or hinder that migration. Research aiming at providing relevant social policy recommendations should take these characteristics into consideration when identifying the best strategies to open their markets to international trade in their different sectors. Some of these strategies are as follows: improve infrastructure, increase the average wage and attract more manufacturing firms. These strategies will improve welfare and reduce poverty, decrease income inequality and lower regional disparities. As a result it will bring growth to a region and reduce outmigration. Therefore, this essay will shed light on the movements of labor supply caused by international trade and its effect on regional inequalities.

2. A Migration Model

All sectors and regions of a country do not grow at the same time; sectors in some of the regions expand first, acquiring more productive economic processes in order to reach higher efficiency levels (van den Berg, et al., 2008). These leading regions require more labor to continue their development. Once the available labor supply is employed, these regions require migrant workers to meet their demand for labor, creating an internal migration from regions less developed to those leading productive regions. International trade generates unequal growth by increasing the market for exporting sectors, and contracting those of import-competing industries. These industries are often located in different regions of the country.

Before proceeding to the migration model, it is necessary to conceptualize the decision process an individual takes before considering to migrate. An individual weighs both the economic and non-economic factors before making his decision. In time *t-1* the worker will weigh the expected utility of staying against the expected utility from migrating.

Staying	Vs.	Migrating
$EU(w_{it} + a_{it})$	Vs.	$EU(w_{jt} + a_{jt} - TC_{ij})$

In every time period considers the wage he will get in time *t* if stays in his own region i (w_{it}) against the wage he might receive in time *t* if he migrates to region *j* (w_{jt}). The expected utility also includes the amenities he can get by staying (a_{it}) compared to the ones he can get by migrating (a_{jt}). Another factor to consider is the transportation cost he will incur if he migrates from region i to j (TC_{ij}). The transportation cost is a function of variables such as distance between regions i and j, and a border crossing variable that captures whether he needs to cross the international border to arrive to region j:

$$TC_{ij} = f\,(\text{distance}_{ij}, \text{border crossing})$$

However in time *t-1*, the wages for time *t* are unknown and he faces a distribution of jobs, each with a given wage and given probability, in the next period. To estimate the future wages, he calculates the expected value of both wages in time t:

$$E(w_{kt}) = \int_{t=0}^{n} (w_{kt-1} + \Delta w_k)\, P(job_{kt}) dt \qquad \text{where k= i and j}$$

The expected value of the wage in region k in time t is a function of the current wage in time *t-1* plus the expected increase of wages (Δw_k) in region k from time t-1 to time t. This equation is multiplied by the probability of being employed in region k in time t [$P(job_{kt})$]. The probability of getting a job in region k, $P(job_{kt})$, is a function of variables like unemployment, and population density.

The expected value of the change in wage from time *t* to *t-1*, is assumed to be a function of changes in regional Gross Value Added (GVA), (ΔG_k), which at the same time is function of characteristics of the region, variables such as distance to the market,[4] trade openness, and industrial structure in region *k (Zk)*:

$$E(\Delta w_k) = f\,(\Delta G_k(\,\Delta Z_k))$$

[4] The closer to the market, the higher the wage.

To identify the specific effect of trade through its effect on GVA, we use a two-stage-least-squares (2SLS) method. In the first stage, equationEquation 1, we estimate the change in regional GVA since 1985 caused by trade openness. We run this estimation at the district level (destination region) to predict the change in GVA caused by trade with the United States $(\widehat{\Delta GVA})$, and then we aggregate the results to get the state level effect. To capture trade openness, we include the measures of the GVA for three different sectors (commerce, manufacturing and mining) in period *t-1* (GVA_{sit-1}) multiplied by the change on tariffs in the respective sector ($\Delta\tau_{st}$). This interaction term captures the potential growth or contraction in regional GVA associated with a reduction in tariffs ($\Delta\tau_{st} * GVA_{sit-1}$). we include the annual average number of maquiladora establishments by municipality ($maquila_{it}$), since the maquiladora program was aimed to attract foreign direct investment in the production of exportable goods (Fernández-Kelly, 2007). A continuous variable that reflects the road distance (in thousands of kilometers) from the capital of region *i* to the closest U.S. border crossing point is included (*dist*F) given the influence that the proximity to the United States market. The model also includes the interaction variables of $\Delta\, \tau_{st} * GVA_{sit-1}$ for every sector with $distF_i$.

Equation 1

$$\Delta GVA_{it} = \beta_1 \Delta\tau_{st} * GVA_{sit-1} + \beta_2 maquila_{it} + \beta_3 distF_i + u_{jt}$$

In the second stage, Equation 2, migration from state i to district j is estimated using a Gravity Model. The number of migrants that migrate from *i* to *j* within the last 5 years is given as M_{ijt}. The origin-specific factors, pushing migrants to the corresponding areas in period *t-1*, are given as O_{it-1}. The destination-specific factors pulling migrants from the corresponding areas in period *t-1* are given as D_{jt-1}. The distance between *i* and *j* which affects migration according to some monotonic inverse function *f*( ) is given as $OD\_Distance_{ij}$ and $OD\_Distance^2{}_{ij}$. The distance from the destination place to the nearest border crossing point of the US-Mexico border is given as $distF_i$. Finally, the estimated differences in GVA with respect to 1985 caused by trade openness $(\widehat{\Delta GVA})$ for the origin (*i*) and the destination (*j*) are included.

Equation 2

$$ln(M_{ijt}) = \gamma_1 O_{it-1} + \gamma_2 D_{jt-1} + \gamma_3 OD\_Distance_{ij} + \gamma_4 OD\_Distance^2{}_{ij} + \gamma_5 distF_j + \gamma_6 \widehat{\Delta GV}A_i + \gamma_7 \widehat{\Delta GV}A_j + u_{jt}$$

3. Data

The migration flows are at state-district levels: The origin is at the state level, with 32 states, whereas the destination is at the district level, with 170 districts. The National Institute of Statistic and Geography (INEGI) presents this information at the state and municipal level, for the origin and destination, receptively. But this level of information produced a large number of zero flows which skew the data, and can bias the estimated coefficients (LeSage, et al., 2008). The percentage of zero observations at the state-muni levels was 54%, whereas at state-district level it reduces to 5%. To collapse the destination data from muni to electoral district level, we use the information provided by the Secretariat of Governance (SEGOB, 2005) where it describes what municipalities belong to which electoral districts. This new level provides a standard destination level across the country.

We collected the data on internal migration flows, demographics, infrastructure, distances (proxy for migration cost), GVA, labor markets and on tariffs. These data were collected from the economic and population censuses from the INEGI. These variables are defined in Table 2. Summary statistics are provided in Table 5 in the appendix.

Table 2 Variables Used in the Model

Variable Name	Description
M_{ij}	Log(Migration flow from *i* to *j* 5 years before)
GVA in 1985	GVA from 1985 in real 2003 pesos for all the sectors
GVA_hat	The difference in GVA with respect to 1985's GVA that is explained by trade
GVA Commerce	GVA in Commerce sector in real 2003 Mexican pesos
GVA Manufacturing	GVA in Manufacturing sector in real 2003 Mexican pesos
GVA Mining	GVA in Mining sector in real 2003 Mexican pesos
Tariff Commerce	% Tariff in Commerce Sector
Tariff Manufacturing	% Tariff in Manufacturing Sector
Tariff Mining	% Tariff in Mining Sector
Border Distance	Log (Road Distance from the District head to the nearest border crossing point)
O-D Distance	Log(Distance between receiving and sending states in Kms)
O-D Distance squared	Log(Distance between receiving and sending states in Kms) squared
Population Density	Population per squared kilometer
Maquila	Number of maquiladora establishments in the region
D-O Difference on Remuneration per Worker	Difference between Destination and Origin lagged Remuneration per worker (in thousands of real 2003 pesos)
<2 minimum salaries	Lagged % labor force with 0 - 2 Minimum Salaries
2-10 minimum salaries	Lagged % labor force with 2 -10 Minimum Salaries
>10 minimum salaries	Lagged % labor force with more than 10 Minimum Salaries
Infrastructure	Lagged principal component variable of % of households with electricity, water and sewage
Own House	Lagged % households that owned their homes
Fertility Rate	Lagged Fertility Rate
% Women	Lagged % of Women population
District City	Dummy variable for Destination Districts>500,000 inhabitants
Total Population	Lagged Ln Total Population

Migration Flow (M_{ij}): Migration data come from the 1990, 2000 Population Censuses and the 2005 Population Count from a question that asks residents of a district in what states or country the interviewee resided five years earlier. Though this approach might be standard, these data have the drawback of failing to count migrants who might have left and returned over the five-year period. Flows to the United States derived from a question asking whether a member of the household has gone to the United States during the last 5 years and has not returned and are obtained from the National Population Council (CONAPO).

GVA: To control for regions that had a high level of economic activity before NAFTA, we include their GVA for 1985. We also include the estimated difference in GVA with respect to 1985's GVA explained by trade in order to observe the effect that NAFTA had on internal migration in the sending and receiving regions. These data ware also obtained from the INEGI's economic censuses

GVA sectors: We also include the measurements of the GVA for three different sectors (commerce, manufacturing and mining) in period *t-1* for the origin and destination areas. These data were obtained from the INEGI's economic censuses.

Tariffs: Trade openness was not the same across all sectors. Some sectors reduced tariffs faster than others, making these sectors grow faster than the others (Aguayo-Tellez, et al., 2010). Therefore, to identify the effect that NAFTA had on internal migration, through trade openness, we use the different tariffs available for the different sectors. These data were obtained from the United States International Trade Commission (USITC). We use the data available, with an annual frequency, of the U.S. tariffs on Mexican exports at the 1-digit Standard Industrial Classification (SIC) level for the light/heavy manufactured, mining and intermediate goods, which we matched to the manufacturing, mining and commerce sectors, respectively. These tariffs were aggregated across different goods on each sector and weighted by their respective trade volumes.

Transportation cost (*distF*): Road distance (in thousands of kilometers) from district '*i*' to the closest U.S. border crossing point, same as in stage 1. We consider that economic growth, and as a result internal migration, will be correlated with transportation cost to the U.S. border, which we proxy with the road distance. This proxy reflects the road distance (in thousands of kilometers) from district '*i*' to the closest border crossing point. To create the border distance variable, d*istF*, we first obtain the name of the district or state capitals (INEGI, 2008). Second, we calculate the road distance from each of the district or states capitals to the different U.S. border crossing points, by entering the destination and origin points in the webpage "Traza tu Ruta" provided by the Secretaría de Comunicaciones y Transportes (2008). Finally, we chose the shortest distance for each district or state capital from the different distances provided by each border crossing point. For district capitals that do not appear as origin points, we calculate the distance of the nearest available city or town and add the road distance from that point to the district capital of interest, which we calculate manually by using a map of Mexico.

Moving Cost ($OD\_Distance_{ij}$ and $OD\_Distance^2{}_{ij}$): Based on the literature, transportation costs are best approximated by using a quadratic function of the distance between the origin and destination (Greenwood, 1997; Aroca, et al., 2005).This proxy includes the moving cost, which increases as the length of the distance increases, and the communication costs with their family in the place of origin, including the cost to visit them. Previous literature assumes a negative effect of distance. That said, the more the distance, the less the migration.

Population density: Greenwood (1997) mentions that migration is directly related to the population size of the origin and destination places, since the larger the origin and destination, the higher the number of people migrating from that origin to that destination. Thus, we control for the population size because regions with larger concentrations of people will tend to have more in- and out-migration. In this case, we use the population density (population per squared kilometer) that districts and states report, including children and elderly, in every population census.

Maquiladoras: Since maquiladoras tend to attract people (Cravey, 1998), we include a control variable which is the number of maquiladora establishments in the region. The maquila variable is created by calculating the annual average from the monthly number of establishments in the relevant region provided by the Estadística de la Industria Maquiladora de Exportación, (INEGI, 2007). Although this approach is standard, it has the drawback of failing to count the size of the maquiladoras. Including the number of workers employed in maquiladoras might give a better proxy of the weight of the maquiladora sector in the region than only using the number of maquiladora establishments.

Labor markets: The remuneration per worker is generated as total remuneration paid[5] in a district/state divided by the number of workers registered in that year for that region. The percentage of labor force earning X number of minimum salaries is generated by taking the number of participating workers earning an X number of minimum salaries and dividing it by the total labor force. This information was collected in the 1989, 1999 and 2004 economic censuses by the National Institute of Statistic and Geography (INEGI). It is important to note that the remuneration per worker is calculated taking the total number of people working whereas the percentage of labor force earning X number of minimum salaries is calculated taking the total labor force, which includes the unemployed.

Infrastructure: Investment in infrastructure provided by the local governments plays an important role in the migration decision since people tend to migrate from places with low levels of infrastructure and to places with high levels of infrastructure. This infrastructure reflects the amenities available in the destination area, implying a positive relation with migration decisions (Aroca, et al., 2005). Thus, better infrastructure will shape the decision to migrate (Lucas, 1997). Therefore, we include the percentage of households with water, electricity and sewage. This information was obtained from the INEGI's population censuses.

Own a house: Percentage of population that owns a house may reflect the probability that people will have to rent a place in the destination region. However, it might also reflect a cost of

[5] Remunerations are presented in real thousand pesos from 2003

moving because people who own their houses will be less likely to migrate, and give up the local capital when they move (Greenwood, 1997).

Fertility and Women: Little has been done to study the correlation of migration with fertility and women. However, the literature mentions that destination regions tend to have lower fertility rates than the origin (LaLonde, et al., 1997) and also that migrants will go to places with high female labor force participation (Mincer, 1978). Thus, we use the fertility rate and the percentage of women as proxies in the origin and destination to control for these effects. This information has been obtained from the INEGI's population census.

Urban areas (District City): Because the INEGI does not provide the GVA in the agricultural sector for the same periods included in this analysis, we cannot observe rural migration before and after NAFTA. Therefore, we create a dummy variable for those destination places with more than 500,000 inhabitants (Anzaldo Gómez, et al., 2008), which will allow me to distinguish urban from rural migration.

4. Hypothesis

Combining the different migration and the standard trade theories, we generate the following testable hypotheses:

H1: Internal migrants were attracted to regions with growth spurred by trade. This will be observed by having a positive relationship between destination states that were more positively impacted by trade and higher economic growth.

A supplementary hypothesis is that traded sectors, like manufacturing, were more influenced by NAFTA because they presented more economic growth than non-traded sectors. This would be observed by having a positive relationship between destination regions with higher traded sectors and higher openness to trade.

H2: Labor movement from Mexico to the United States dropped after NAFTA, because there was more labor demand in Mexico with trade openness, which reduced the incentive to migrate to the United States. Alternatively, as Audley et al. (2004) mention, the agreement created a "hump" of migration, which would actually *increase* migration after NAFTA due to a large number of Mexican labor displaced by the economic restructuring.

H3: Finally, income distribution created a potential barrier to internal migration. Regions with high income disparities tended to have more out-migration whereas places with less income disparities received more migration (Connell, 1983).

5. Results

1st Stage

Table 6 reports the regression results from the first stage for the origin and destination places, state and district levels, respectively. We regress the difference in GVA with respect to 1985 caused by trade openness. Column 1 shows the regression at the district level, where most variables are significant at the 1% level. The interaction variable of the sectoral GVA with the change in tariff in that sector $(\Delta\tau_{sector,t} * GVA_{sector,t-1})$ is significant for all the sectors. The marginal effect of tariffs decreases of one percent decreases the difference in GVA in commerce by 0.87% whereas it increases the difference on GVA in manufacturing and mining by 0.18% and 1.47%, respectively.

The variable distance to the border $(distF)$ is not significant, but its interaction variables with the sectoral GVA and the change in tariff in that sector $(\Delta\tau_{sector,t} * GVA_{sector,t-1})$ are significant for all the sectors. As expected, the distance interaction $(distF * \Delta\tau_{sector,t} * GVA_{sector,t-1})$ coefficients are negative for the manufacturing and mining sectors and positive for the commerce sector, which agree with the previous literature (Baylis, et al., 2010). This means that the closer they are to the border, the higher the change in GVA from 1985, for the mining and manufacturing sectors. Whereas for the commerce sector, the farther away from the border the higher the change in GVA. However, once we calculate the marginal effect of distance and its interactions with GVA and change in tariffs, the effect is the opposite. Table 8 reports the marginal effects of a change in distance $(distF)$ and tariffs $(\Delta\tau)$ after NAFTA. The marginal effect of distance (in one kilometer) decreases the difference in GVA in commerce by 0.067% and increases the difference in GVA in manufacturing and mining by 0.005% and 0.015%, respectively. Thus, a region will have a higher difference in GVA for manufacturing and mining the farther away it is from the border.

Finally, the maquiladora variable is positive and significant, well within the range in previous literature (Baylis, et al., 2010; Fernández-Kelly, 2007; Rodríguez-Pose, et al., 2005) where maquiladora establishments attracted investment and increased the production of exportable goods and, as a result, the region's GVA will be higher.

2nd Stage

Table 7 reports the regression results using spatial cross sectional data for 5,440 observations related to 170 destination districts, 32 origin Mexican states and the United States over 3 years (1990, 2000 and 2005)[6]. We regress the number of migrants who moved from state i to district j against various characteristics to see whether the influence of these characteristics changed after NAFTA. We find substantial spatial correlation in the error terms for both the spatial-error and spatial-lag cross-section regression, with the degree of spatial correlation in the errors (λ) ranging from 0.29 to 0.77. The Robust Lagrange Multiplier test shows that the spatial-lag model is the most appropriate model to use. As a result, we based my results on the spatial-lag model (Table 7).

Starting with model 1, columns 1 to 3, we can observe that the change in GVA from 1985 explained by trade (*GVA_hat*) is positive and significant for the destination regions for all the years (1990, 2000 and 2005). This result fails to reject the first hypothesis because trade openness attracts migrants, proving that the maquiladora project, the GATT and the NAFTA agreement attracted labor. However, it's interesting to note that the effect decreases substantially over time, showing that most of the trade-driven effect on internal migration happened before NAFTA, after Mexico joined

[6] We are not using data from 1995 because INEGI did not gather information about migration in the *Conteo de Poblacion y Vivienda* 1995.

the GATT. The supplementary hypothesis deals with destination regions with higher traded sectors. From stage 1, we observe that in fact, regions with more traded sectors such as manufacturing and mining benefited more from trade openness. As a result these regions with a higher traded sector attracted more internal migration.

In model 2, columns 4-6, we include the Mexico-U.S. migration, treating the United States as the 33rd Mexican state and create a dummy variable which identifies this migration to the United States. These coefficients are positive and significant in years 2000 and 2005 indicating that migration to the United States actually increased after NAFTA. Thus, we can reject our second hypothesis that migration from Mexico to the United States dropped after NAFTA. This result is consistent with the idea that the agreement will create a "hump" of migration which will actually *increase* migration after NAFTA due to a large number of Mexican labor displaced by the economic restructuring (Audley, et al., 2004). This evidence supports the alternative hypothesis because migration to the United States has increased substantially after NAFTA, even after the IIRIRA[7] Act in 1996 which significantly tightened border enforcement along the U.S.-Mexico border and was expected to reduce considerably the flow of unauthorized migrants (Hanson, 2007).

Turning to the third hypothesis (model 4, columns 10-12), we include the variables percentage of labor force earning less than twice the minimum wage (*D_<2 minimum salaries*) and the percentage of labor force receiving more than ten minimum salaries on the destination location (*D_>10 minimum salaries*) and omitted the percentage of labor force receiving between 2 to 10 minimum salaries (*D_2-10 minimum salaries*). The percentages of the labor force earning less than twice or more than ten the minimum wage are significant, and their signs are negative in all the specifications involving the

[7] The Illegal Immigration Reform and Immigrant Responsibility Act of 1996

destination location. This means that places with higher percentages of the working-age population receiving less than twice or more than ten minimum salaries are not drawing people. The effect of the labor force receiving more than ten minimum salaries decreases almost in half over time, whereas the effect of the labor force with less than two minimum salaries increased. These two variables for the origin places are also significant with a negative sign in all the specifications. The negative sign is consistent with the hypothesis that a base level of wages is required to be able to leave, and that only workers with more than 2 or less than 10 minimum salaries will migrate to places with a higher percentage of labor force receiving between 2 to 10 minimum salaries. These results confirm that workers will not leave or go to places with high levels of income disparity, which differs from Conell's (1983) that migration will happen due to income disparity.

The difference in remuneration per worker between the destination and origin regions shows an interesting effect. Before NAFTA, destination regions with a higher remuneration were attracting more migrants whereas, after NAFTA, the remuneration effect is not a pull force anymore. The coefficient on the variable changes sign in 2000. We attribute this change due to sharp peso crisis Mexico had after signing NAFTA, which increased unemployment[8] as well as caused a 25 percent drop in wages (Aroca, et al., 2005). Thus, finding a job was as important as finding a good paying job.

The cost of movement variable –road distance from the destination place to the nearest border crossing point (*U.S. Border Distance*)— is significant and negatively associated with internal migration, well within usual range on previous literature (Baylis, et al., 2010; Rodríguez-Pose, et al., 2005). This

[8] As mentioned before, the remuneration per worker is calculated taking the total number of people working whereas the percentage of labor force earning X number of minimum salaries is calculated taking the total labor force, which includes the unemployed.

evidence confirms that trade openness can lead to an increase of internal migration into the northern border states due to the concentration of economic activity in this region.

The cost of movement variable –distance from origin to destination (*O-D Distance* and *O-D Distance squared*)—is significant in all the specifications but the coefficients have an opposite sign than those found in previous literature (Borjas, 2000; LeSage, et al., 2007; Massey, 1990; LeSage, 2010). However we get a tipping point of about 100kms. This is because, in the case of Mexico, there is a large labor migration from the south to the north of Mexico, especially from rural to urban region (Aguayo Tellez, 2005).

Finally, infrastructure is, as expected in an amenity, significant in all the specifications and with a positive coefficient on the destination and negative coefficient on the origin. This evidence supports the literature where the level of infrastructure has a pull effect, which attracts migrants to regions with higher levels of infrastructure, and it is also a reason to abandon a region with low level of infrastructure. One important finding is that the effect of infrastructure as a draw decreases significantly after NAFTA while it increases as a push. These results reinforce the importance of infrastructure on the migration decision, which gains strength as a push factor after NAFTA.

Demographic Variables

The total population of the destination location (*Total Population*) is significant and with a positive sign in all the specifications, a result consistent with the market size. The coefficient on the origin population (*O_Total Population*) is stable with a positive sign across all the specifications.

The dummy variable for destination districts with more than 500,000 inhabitants (*District City*) is only significant for the year 2005. This agrees with the urban-centric literature that mentions that people tend to migrate from the country side to cities (Kearney, 1986). But the most interesting finding is that this effect gains importance only after NAFTA, which shows the growth that urban areas gained after NAFTA (Baylis, et al., 2010; Aroca, et al., 2005). This means that NAFTA increased the levels of output per worker in large cities, augmenting the economic concentration, and causing cities to grow faster than other regions and attract more immigration.

The percentage of households that owned their homes is both significant and negative on the destination as well as the origin locations. This is consistent with the idea that migration flows will tend to go to places where there are more chances to rent a house and will tend to happen when the person does not own a house. The coefficient on the origin location is not significant for the specifications run without the US observations.

The fertility rate and the percentage of women are negative and significant across all the specifications and in both type of locations, origin and destination. It does appear that migration flows are done from and to places with lower percentages of women and lower fertility. Note that also, the majority of internal migrants are men (Lucas, 1997). One interesting thing is to observe how the effects of these factors decrease their magnitude over time. Only the fertility rate in the destination does not follow this trend.

We test for robustness of these results to different specifications. First, we run Model 4 without the U.S. observations, and the results were essentially unchanged. Second, we run the regression as spatial-error model, and the results were also similar. Last, we run the regression as a non-spatial data and obtain related results.

6. Conclusions

This essay contributes to the understanding of the mechanisms of labor adjustment, an important aspect of economic development. It also demonstrates how trade openness has influenced this labor adjustment; specifically, whether or not migration within Mexico, particularly to urban areas and to the United States, increased after NAFTA.

At the beginning of this essay, we asked whether NAFTA increased internal migration but reduced migration to the United States. My results show that trade openness has increased internal migration, but this effect diminishes over time, confirming that much of the trade-generated migration happened after Mexico joined the GATT. In the same form, the flow of migrants to the United States has increased due to the pull caused by the U.S. economy over the transportation cost to get to the United States, especially in the years following the NAFTA agreement. Thus, there is evidence of a "hump" of migration to the United States as Audley, et al. (2004) mention, as the large number of Mexicans displaced by economic restructuring would lead temporarily to more migration.

The results indicate that trade liberalization has not reduced internal migration, but instead led to a greater labor adjustment within Mexico. Urban-rural migration has also increased because most of the low skill workers are leaving the rural and arriving to the urban regions. Places with higher levels of infrastructure will attract workers since this will provide a better standard of living. Also, those Mexican regions with high percentage of labor force earning between 2 to 10 minimum salaries have lost from trade liberalization by having an increasing amount of labor leaving these regions.

The analysis in this essay confirms that trade has indeed increased internal migration and the flow of migrants to the United States. But it also shows what other factors have contributed to increased internal migration. The management of these factors by local governments will allow the creation of regional development policies to reduce out migration (from a region concerned with losing their manpower) or to increase immigration (in a region interested in attracting more labor supply). In this essay we observed that regions with significant income disparities are not able to attract migration flows but that local governments that invest in basic infrastructure are able to attract migration flows and, more importantly, will not have a net out migration. Further research is necessary to determine what other factors influence internal migration and are likely to shape the next phase of Mexico's regional development.

7. Annex

Table 3: Regional churning of migrants by state in 1990

State	Total	Not Migrant	Receiving #	Receiving As % of Migration	Sending #	Sending As % of Migration	Net-Migration #	Net-Migration As % of Migration
México	8,563,538	7,715,847	787,020	23%	271,421	8%	515,599	15%
Baja California	1,425,801	1,178,743	220,848	6%	40,309	1%	180,539	5%
Chihuahua	2,118,557	1,978,526	118,343	3%	40,146	1%	78,197	2%
Quintana Roo	412,868	314,471	92,895	3%	18,969	1%	73,926	2%
Morelos	1,048,065	950,127	91,322	3%	39,613	1%	51,709	1%
Nuevo León	2,750,624	2,616,715	114,049	3%	66,247	2%	47,802	1%
Jalisco	4,584,728	4,359,271	178,259	5%	138,366	4%	39,893	1%
Tamaulipas	1,974,755	1,843,870	115,424	3%	75,599	2%	39,825	1%
Querétaro	898,199	823,330	67,976	2%	29,264	1%	38,712	1%
Aguascalientes	619,401	570,895	44,012	1%	17,452	1%	26,560	1%
Sonora	1,596,063	1,508,975	72,307	2%	53,840	2%	18,467	1%
Baja California Sur	275,985	243,260	29,539	1%	11,735	0%	17,804	1%
Colima	371,876	337,232	31,123	1%	18,356	1%	12,767	0%
Tlaxcala	662,426	623,570	35,906	1%	25,028	1%	10,878	0%
Campeche	456,452	418,566	34,500	1%	24,697	1%	9,803	0%
Guanajuato	3,396,283	3,266,666	98,926	3%	94,976	3%	3,950	0%
Nayarit	711,691	669,150	35,934	1%	38,769	1%	-2,835	0%
Tabasco	1,288,222	1,230,380	47,965	1%	54,412	2%	-6,447	0%
Yucatán	1,188,433	1,143,643	38,395	1%	47,384	1%	-8,989	0%
Coahuila	1,730,829	1,650,636	69,278	2%	80,748	2%	-11,470	0%
Puebla	3,565,924	3,416,498	126,056	4%	139,132	4%	-13,076	0%
San Luis Potosí	1,723,605	1,642,499	64,531	2%	77,650	2%	-13,119	0%
Michoacán	3,037,340	2,896,080	106,146	3%	121,134	3%	-14,988	0%
Hidalgo	1,628,542	1,548,781	67,114	2%	85,909	2%	-18,795	-1%
Sinaloa	1,923,515	1,825,563	83,139	2%	105,330	3%	-22,191	-1%
Chiapas	2,710,283	2,638,242	43,947	1%	69,824	2%	-25,877	-1%
Zacatecas	1,100,898	1,051,465	36,731	1%	68,784	2%	-32,053	-1%
Durango	1,169,332	1,117,969	41,301	1%	82,359	2%	-41,058	-1%
Oaxaca	2,602,479	2,511,418	74,083	2%	138,780	4%	-64,697	-2%
Veracruz	5,424,172	5,228,654	163,924	5%	236,281	7%	-72,357	-2%
Guerrero	2,228,077	2,159,919	46,959	1%	120,236	3%	-73,277	-2%
Distrito Federal	7,373,239	7,020,558	299,285	9%	1,035,758	30%	-736,473	-21%
USA					126,486	4%		
Total	70,562,202	66,501,519	3,477,237	100%	3,477,237	100%	0	0%

The blue colors show the top 5 states receivers of migrants, whereas the red colors are the top 5 states senders.

Table 4: Regional churning of migrants by state in 2000

State	Total	Residents	Receiving #	Receiving As % of Migration	Sending #	Sending As % of Migration	Net-Migration #	Net-Migration As % of Migration
México	11,097,516	10,353,640	688,200	19%	438,970	12%	249,230	7%
Baja California	2,010,869	1,740,820	229,547	6%	64,966	2%	164,581	5%
Tamaulipas	2,427,309	2,242,226	164,697	5%	69,164	2%	95,533	3%
Chihuahua	2,621,057	2,450,504	138,616	4%	49,694	1%	88,922	2%
Quintana Roo	755,442	625,774	123,574	3%	35,872	1%	87,702	2%
Nuevo León	3,392,025	3,239,025	128,902	4%	66,925	2%	61,977	2%
Querétaro	1,224,088	1,137,537	78,652	2%	32,422	1%	46,230	1%
Morelos	1,334,892	1,239,182	83,614	2%	48,982	1%	34,632	1%
Baja California Sur	374,215	330,561	40,339	1%	15,888	0%	24,451	1%
Sonora	1,956,617	1,862,929	77,072	2%	55,486	2%	21,586	1%
Guanajuato	4,049,950	3,922,657	94,420	3%	75,176	2%	19,244	1%
Tlaxcala	846,877	803,801	39,436	1%	26,573	1%	12,863	0%
Jalisco	5,541,480	5,322,614	155,237	4%	142,660	4%	12,577	0%
Colima	457,777	421,069	30,741	1%	20,853	1%	9,888	0%
Hidalgo	1,973,968	1,876,884	86,888	2%	78,527	2%	8,361	0%
Campeche	606,699	570,757	33,873	1%	28,524	1%	5,349	0%
Coahuila	2,018,053	1,929,877	72,981	2%	68,591	2%	4,390	0%
Yucatán	1,472,683	1,422,300	44,554	1%	43,575	1%	979	0%
Total	84,794,454	80,565,026	3,584,957	100%	3,584,957	100%	0	0%
Nayarit	815,263	768,930	36,772	1%	41,057	1%	-4,285	0%
Zacatecas	1,188,724	1,139,015	33,121	1%	45,706	1%	-12,585	0%
Michoacán	3,479,357	3,341,540	94,038	3%	107,161	3%	-13,123	0%
Puebla	4,337,362	4,179,456	131,109	4%	150,373	4%	-19,264	-1%
San Luis Potosí	2,010,539	1,945,855	50,898	1%	73,711	2%	-22,813	-1%
Sinaloa	2,241,298	2,130,225	96,899	3%	122,258	3%	-25,359	-1%
Durango	1,264,011	1,212,364	38,362	1%	65,057	2%	-26,695	-1%
Tabasco	1,664,366	1,614,643	43,815	1%	73,612	2%	-29,797	-1%
Chiapas	3,288,963	3,222,193	45,240	1%	89,244	2%	-44,004	-1%
Oaxaca	3,019,103	2,923,845	76,764	2%	139,705	4%	-62,941	-2%
Guerrero	2,646,132	2,572,010	52,632	1%	139,616	4%	-86,984	-2%
Veracruz	6,118,108	5,941,172	155,031	4%	374,545	10%	-219,514	-6%
Distrito Federal	7,738,307	7,309,269	376,494	11%	780,312	22%	-403,818	-11%
USA					293,373	8%		

The blue colors show the top 5 states receivers of migrants, whereas the red colors are the top 5 states senders.

Table 5 Summary Statistics. Reported statistics are mean, (standard errors), and [minimum, maximum] values.

	Destination (district level)			*Origin (state level)*		
Year	1990	2000	2005	1990	2000	2005
Obs	170	170	170	32	32	32
Immigration	637	659	442	3,496	3,614	2,426
	(5,466)	(4,927)	(2,963)	(18,465)	(16,290)	(9,963)
	[0; 311,103]	[0; 269,565]	[0; 166,890]	[16; 548,974]	[15; 448,546]	[10; 280,644]
GVA Total in millions of 2000 MXP	589	789	877	2,710	3,750	4,210
	(6,740)	(9,310)	(10,400)	(15,400)	(21,200)	(23,700)
	[5; 88,200]	[5; 122,000]	[5; 136,000]	[4,; 88,200]	[6; 122,000]	[6; 136,000]
GVA Commerce in millions of 2000 MXP	12	14	14	421	570	602
	(17)	(18)	(18)	(2,000)	(2,810)	(2,970)
	[1; 130]	[1; 131]	[1; 133]	[8; 11,400]	[8; 16,000]	[9; 16,900]
GVA Manufacturing in millions of 2000 MXP	71	72	73	837	923	914
	(99)	(99)	(99)	(2,590)	(3,040)	(2,960)
	[5; 814]	[5; 814]	[5; 814]	[30; 14,700]	[35; 17,300]	[35; 6,900]
GVA Mining in millions of 2000 MXP	73	73	74	428	427	458
	(104)	(104)	(105)	(556)	(556)	(605)
	[5; 865]	[5; 865]	[5; 865]	[21; 2,920]	[21; 2,920]	[21; 2,920]
Tariff Commerce (%)	0.039	0.026	0.017	0.039	0.026	0.017
	(0)	(0)	(0)	(0)	(0)	(0)
	[0.039; 0.039]	[0.026; 0.026]	[0.017; 0.017]	[0.039; 0.039]	[0.026; 0.026]	[0.017; 0.017]
Tariff Manufacturing (%)	0.052	0.056	0.039	0.052	0.056	0.039
	(0)	(0)	(0)	(0)	(0)	(0)
	[0.052; 0.052]	[0.056; 0.056]	[0.039; 0.039]	[0.052; 0.052]	[0.056; 0.056]	[0.039; 0.039]
Tariff Mining (%)	0.005	0.002	0.002	0.005	0.002	0.002
	(0)	(0)	(0)	(0)	(0.00)	(0.00)
	[0.005; 0.005]	[0.002; 0.002]	[0.002; 0.002]	[0.005; 0.005]	[0.002; 0.002]	[0.002; 0.002]
Border Distance	985	985	985	968	968	968
	(472.74)	(472.74)	(472.74)	(491.96)	(491.96)	(491.96)
	[1; 2,322]	[1; 2,322]	[1; 2,322]	[1; 2,004]	[1; 2,004]	[1; 2,004]
Population Density per sq. km	200	228	230	242	267	268
	(1,095.95)	(1,102.14)	(1,065.92)	(960.98)	(1,003.89)	(988.28)
	[1; 13,919]	[1; 13,790]	[2; 13,246]	[4; 5,486]	[6; 5,732]	[7; 5,645]
Maquila	8	12	11	42	61	57
	(44.29)	(66.30)	(59.36)	(121.38)	(181)	(160)
	[0; 487]	[0; 779]	[0; 677]	[0; 609]	[0; 950]	[0; 808]
Remuneration per Worker	33	28	30	42	37	39
	(20.06)	(16.54)	(17.86)	(12.13)	(12.99)	(13.95)
	[4; 106]	[3; 95]	[5; 101]	[22; 64]	[18; 73]	[17; 71]
% Labor Force with <2 Minimum Salaries	0.666	0.588	0.565	0.630	0.517	0.483
	(0)	(0)	(0)	(0)	(0.13)	(0.15)
	[0.328; 0.901]	[0.213; 0.902]	[0.140; 0.903]	[0.400; 0.801]	[0.222; 0.759]	[0.176; 0.746]
% Labor Force with 2-10 Minimum Salaries	0.265	0.334	0.355	0.302	0.396	0.424
	(0)	(0)	(0)	(0)	(0.11)	(0.13)
	[0.044; 0.544]	[0.067; 0.646]	[0.075; 0.708]	[0.144; 0.512]	[0.178; 0.633]	[0.189; 0.667]
% of Households with Sewers	0.508	0.675	0.804	0.596	0.753	0.863
	(0)	(0)	(0)	(0)	(0.12)	(0.09)
	[0.101; 0.951]	[0.167; 0.975]	[0.295; 0.987]	[0.300; 0.940]	[0.450; 1.000]	[0.620; 1.000]
% of Households with Electricity	0.813	0.910	0.951	0.863	0.929	0.963
	(0)	(0)	(0)	(0)	(0.03)	(0.02)
	[0.264; 0.990]	[0.526; 0.985]	[0.467; 0.990]	[0.670; 1.000]	[0.850; 1.000]	[0.920; 1.000]
% of Households with Water	0.730	0.780	0.835	0.787	0.831	0.882
	(0)	(0)	(0)	(0)	(0.09)	(0.09)
	[0.294; 0.970]	[0.380; 0.971]	[0.415; 0.985]	[0.560; 0.950]	[0.590; 0.960]	[0.640; 1.000]
% Households that owned their homes	0.809	0.804		0.792	0.789	
	(0)	(0)	N/A	(0)	(0.05)	N/A
	[0.625; 0.943]	[0.580; 0.937]		[0.652; 0.883]	[0.680; 0.868]	
Fertility Rate	3	3	3	3	3	3
	(0.37)	(0.37)	(0.35)	(0.26)	(0.24)	(0.22)
	[2; 4]	[2; 4]	[2; 4]	[2; 3]	[2; 3]	[2; 3]
% of Women population	0.505	0.509	0.512	0.506	0.509	0.511
	(0)	(0)	(0)	(0)	(0.01)	(0.01)
	[0.476; 0.530]	[0.473; 0.537]	[0.476; 0.538]	[0.483; 0.522]	[0.488; 0.522]	[0.490; 0.524]

Table 6 1st Stage: OLS regression for ΔGVA

	(1)
Place	Destination
$\Delta\tau_{commerce,t} * GVA_{commerce,t-1}$	-1.30e-08***
	(-5.92)
$\Delta\tau_{manufacturing,t} * GVA_{manufacturing,t-1}$	1.53e-09***
	(4.01)
$\Delta\tau_{mining,t} * GVA_{mining,t-1}$	1.67e-08***
	(6.03)
$distF * \Delta\tau_{commerce,t} * GVA_{commerce,t-1}$	1.06e-08***
	(4.57)
$distF * \Delta\tau_{manufacturing,t} * GVA_{manufacturing,t-1}$	-1.16e-09***
	(-3.60)
$distF * \Delta\tau_{mining,t} * GVA_{mining,t-1}$	-1.26e-08***
	(-4.82)
$distF$	-0.102
	(-1.23)
$distF^2$	0.0634
	(1.69)
$maquila$	0.000998***
	(4.34)
x1995	0.0196**
	(2.78)
x2000	0.0289***
	(5.14)
x2005	0.0343***
	(8.29)
Constant	0.0341
	(0.76)
N	684

t-statistics in parentheses * $p<0.05$ ** $p<0.01$ *** $p<0.001$

Table 7 2nd Stage: Spatial Cross Section for ln(migration). Significance levels: * 0.001, ** 0.01, * 0.05**

Model	1 Base Model w/o Mexico-U.S. migration			2 Base Model w/Mexico-U.S. migration			3 Model with wage distribution but w/o Mexico-U.S. migration			4 Model with wage distribution and Mexico-U.S. migration		
Columns	1	2	3	4	5	6	7	8	9	10	11	12
Year	1990	2000	2005	1990	2000	2005	1990	2000	2005	1990	2000	2005
(Intercept)	24.865**	25.553**	18.303**	13.737**	16.588**	13.738**	22.075**	23.117**	17.57**	13.198**	13.937**	11.421**
O-D Distance	2.734**	2.684**	2.465**	2.682**	2.63**	2.413**	2.769**	2.692**	2.464**	2.727**	2.651**	2.42**
O-D Distance squared	-0.304**	-0.295**	-0.27**	-0.297**	-0.287**	-0.262**	-0.31**	-0.296**	-0.27**	-0.304**	-0.29**	-0.263**
Migrate to US				37.964	221.9**	223.96**				15.406	132.51**	136.6**
District City	-0.023	0.115	0.254**	-0.03	0.087	0.235**	-0.02	0.085	0.208**	-0.043	0.08	0.224**
D-O Diff. Remuneration per Worker	0.006**	0.003	-0.001	0.006**	0.003*	0.001	0.004	-0.001	-0.002	0.003**	-0.0003	-0.001
D_GVA_hat	6.143**	1.105*	0.822**	6.146**	1.195**	0.998**	4.696**	1.125**	1.003**	5.49**	0.967**	0.804**
D_Infrastructure	0.257**	0.131**	0.15**	0.271**	0.149**	0.169**	0.276**	-0.011	0.035	0.247**	-0.001	0.008
D_Total Population	0.889**	0.922**	0.884**	0.879**	0.918**	0.872**	0.95**	0.942**	0.853**	0.961**	0.941**	0.845**
D_<2 minimum salaries							-1.593**	-3.348**	-2.849**	-1.696**	-3.287**	-2.811**
D_>10 minimum salaries							-5.506	-8.1**	-4.862	-11.246**	-9.645**	-6.523*
D_Own House	-0.277	-2.97**	-2.936**	-0.461	-3.26**	-3.176**	-0.088	-1.553**	-1.645**	-0.019	-1.779**	-1.796**
D_Fertility Rate	-0.51**	-0.657**	-0.808**	-0.42**	-0.522**	-0.708**	-0.471*	-0.836**	-0.861**	-0.476**	-0.722**	-0.799**
D_% Women	-30.485**	-29.491**	-25.433**	-27.576**	-25.289**	-23.27**	-28.949**	-29.686**	-26.225**	-28.298**	-24.594**	-21.754**
O_GVA_hat	-0.643**	0.965	0.375	-0.741	0.761*	0.092	1.378	-0.135	-0.751**	-0.702	0.225	-0.311*
O_Infrastructure	-0.061	-0.198**	-0.273**	0.018	-0.11**	-0.229**	-0.202**	-0.37**	-0.442**	-0.035	-0.386**	-0.373**
O_Total Population	1.078**	1.112**	1.112**	1.061**	1.085**	1.098**	1.132**	1.109**	1.033**	1.16**	1.087**	1.004**
O_>2 minimum salaries							-2.339**	-3.651**	-1.287*	-2.757**	-5.523**	-2.123**
O_>10 minimum salaries							-15.822	-20.568**	-5.949	-9.103**	-27.525**	-6.112
O_Own House	-4.907**	-5.904**	-4.181**	-0.096**	-0.031**	-0.045**	-3.738**	-4.345**	-3.155**	-0.066**	0.121**	-0.021
O_Fertility Rate	-0.763**	-0.691**	-0.411**	-1.156**	-1.105**	-0.747**	-0.934**	-0.893**	-0.448*	-1.117**	-1.388**	-0.865**
O_% Women	-55.354**	-54.711**	-46.662**	-40.542**	-47.844**	-44.233**	-49.479**	-42.027**	-38.761**	-37.219**	-30.376**	-32.15**
λ	6.69E-34	-1.69E-33	-7.88E-34	9.30E-34	-1.59E-33	-2.84E-34	-2.66E-33	-1.24E-34	8.87E-34	6.36E-34	-6.75E-34	3.29E-34
N	5,440	5,440	5,440	5,643	5,643	5,643	5,440	5,440	5,440	5,643	5,643	5,643

Table 8 Marginal Effect of Change in Distance and Tariffs after NAFTA on GVA growth

Marginal Effect	Distance	Tariff
Commerce	-0.067%	0.87%
Manufacturing	0.005%	-0.18%
Mining	0.015%	-1.47%

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