U.S.-Mexico Border Production and China: Is There a Real Threat?

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Abstract: This paper investigates the impact of foreign competition from China on the supply-chain relationship between the border counties in California and Baja-California versus Arizona-Sonora, and Texas-Nuevo Leon-Tamaulipas. Using data on U.S. employment and wages in four U.S.-Mexico border counties, we study the effects of increased trade with China. Using disaggregated industry-level data we find increased trade with China is associated with significantly lower city-industry employment and wages. In contrast, and as expected, increased imports from Mexico are positively related to increased employment and wages in U.S. Mexico border counties. The results indicate that the U.S.-Mexico supply-chain relationship related to the maquiladora industry is significantly affected by Chinese competition. Implications for policy include ongoing immigration reform efforts for Mexican workers and a need to carefully weight trade policy with China in such future reforms.

Keywords: Employment; Trade Patterns; China; Export Competition.
JEL classification: F13; F43; F23.

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Abstract: This paper investigates the impact of foreign competition from China on the supply-chain relationship between the border counties in California and Baja-California versus Arizona-Sonora, and Texas-Nuevo Leon-Tamaulipas. Using data on U.S. employment and wages in four U.S.-Mexico border counties, we study the effects of increased trade with China. Using disaggregated industry-level data we find increased trade with China is associated with significantly lower city-industry employment and wages. In contrast, and as expected, increased imports from Mexico are positively related to increased employment and wages in U.S. Mexico border counties. The results indicate that the U.S.-Mexico supply-chain relationship related to the maquiladora industry is significantly affected by Chinese competition. Implications for policy include ongoing immigration reform efforts for Mexican workers and a need to carefully weight trade policy with China in such future reforms.

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I. Introduction

The current immigration reform debate related to Mexican immigrant workers increasingly recognizes the economic impact of China which has emerged as a major competitor in the types of products that the U.S. imports from Mexico (San Diego Tribune, May 6, 2007). Specifically, the maquiladora industry represents a vital part of the economic interdependence along the border between the United States and Mexico. The land ports between these two neighboring countries accounts for about 83% of their trade with one another in 2003 (Canas and Coronado, 2004). With China's accession in the WTO in 2001, Mexico faced increased foreign competition which threatens to deteriorate the well-established supply-chain relationship between U.S. border-city suppliers and the maquiladora industry (Canas and Coronado, 2004). Since mid 2000 to August of 2003, 18% of the maquiladoras have shut down (Acevedo, 2003).[1] Moreover, there were months in 2001, in which production in the maquiladoras decreased by as much as 20% (Acevedo, 2003).

It is important to note other factors that may have influenced the slowdown in the maquiladora industry, such as the contraction of external demand due to the U.S. economic recession (Hanson and Robertson (2003), Gerber and Carrillo (2002)). In addition, the increase in the Mexican wage rate relative to competing Asian economies, the raise in China's economic growth and its position as the second-major exporter to the U.S. is generating much concern in border-counties such as San Diego, California and Tijuana, Baja-California and El Paso, Texas, and Cuidad Juárez, Mexico as well as the Mexican economy as a whole.[2]

[1] In 2001 Sonya Electric Co. closed two Tijuana plants and shifted production to China and Indonesia, while multinationals in Cuidad Juárez such as Royal Philips Electronics and Arneses Juárez laid off hundreds of employees in 2002 to produce in China. (Cañas and Coronado 2002)

[2] Gerber and Carrillo (2002) note that the appreciation of the peso against the U.S. dollar decreased employment by raising the cost of Mexican labor; whereas Mollick and Wvalle-Vázquez (2006) find that increases in the Mexican to Chinese relative wage does not lead to a decrease in maquiladora employment.

As noted by Vargas (2001), Texas border counties flourished from their proximity to their maquiladora neighbors. According to Vargas (2001) trade flows through the Texas-Mexico border create demand for jobs in border-city in services such as real estate, legal, accounting, and finance. Moreover, border-city manufacturing also benefit from maquiladoras as U.S. suppliers expand or relocate their production to be close to their customer bases across the border (Vargas, 2001). The opportunity to supply the maquiladora is important since nearly 100 percent of the firms inputs are imported (Robertson, 2003).

However, this cross-border interdependence is being challenged as cost reduction of transportation and communications along with the advancement of technology allows China to increase its role in production sharing to serve the U.S. market.[3] In particular, U.S. imports coming from China increased by 25% between 2000 and 2002, while those from Mexico decreased by 0.74% (Watkins, 2002). In addition to its larger export shares in products such as footwear, toys, lamps and lighting fittings, and luggage, China recently surpassed Mexico in exports of other sectors such as computer hardware. Meanwhile, Mexico's exports to the U.S., and most noticeably the production and employment of Mexican maquiladoras, have decreased since the end of 2000 (Gerber and Mundra, 2003).

The purpose of this research is to examine whether U.S. trade with China has significantly impacted employment and wages in counties along the U.S.-Mexico border. Specifically, we use disaggregated industry-level data to evaluate the effect on increased trade with China on employment and wages in four border counties: (i) San Diego, California; (ii) Nogales, Arizona; (iii) El Paso, Texas; and (iv) Laredo, Texas.

[3] According to Fullerton and Barraza de Anda (2003) excess regulatory burdens has contributed to the erosion of Mexico's geographic advantage.

Our empirical results show that controlling for traditional covariates such as the alternative wage, demand for local goods and services, as well as macroeconomic factors including shocks to national employment, the U.S. business cycle, and U.S.-Mexico exchange rates, higher imports from China are significantly related to lower employment and wages in U.S.-Mexico border counties. In addition, we conduct an investigation into whether the "China effect" on economic areas that are less dependent on manufacturing (such as San Diego) is different from that in other counties such as Nogales, AZ, El Paso, TX, and Laredo, TX. We document this by comparing the effect of Chinese competition on employment and wages in the four U.S.-Mexico Border counties to Wayne County (Michigan) because this Detroit, which is located in this Midwestern state, is one of the primary suppliers to the maquiladoras.

We find that the impact of higher imports from China on employment and wages in San Diego is not significantly greater than that in Wayne, MI. In contrast, Nogales, AZ, El Paso, TX, and Laredo, TX show a significantly greater reduction in both employment and wages relative to Wayne, MI. Intuitively, San Diego's economy is much less heavily reliant on manufacturing relative to the other three U.S.-Mexico border counties and thus more closely resembles the economy of Wayne, MI. While the later is reliant on manufacturing, its supply-chain relationship is much less reliant on the maquiladora industry alone.

The rest of this paper is structured as follows. Section II provides background information on the maquiladora industry and border-city employment. Section III discusses the data and the empirical methodology. Results are presented and discussed in Section IV and Section V concludes with some policy implications.

II. Literature Review

Mexico has a unique relationship with the U.S. partly due to its geographical proximity to its developed neighbor. For example, with the advent of the just-in-time style of production sharing, Mexico has a geographical advantage over China and other Asian countries in supplying intermediate inputs to the United States (Fullerton and Barraza de Anda, 2003). In an effort to alleviate the growing unemployment and poverty in its northern states by building on the locational advantage, the Mexican government established the maquiladora program in 1965, in which supplies, equipment, and machinery from the U.S. could enter Mexico duty free provided that the output ultimately was exported back to the United States.[4]

Over the years, the maquiladora program experienced expansion and contractions in response to the U.S. business cycle and changes in the relative value of peso. However by 2001, the success of the maquiladora program can be noted by the overall increase in employment by 300-fold as compared to 1967 (Cañas and Coronado, 2002) with production growth averaging 13.8 percent between 1994 and 2000 (Acevedo, 2003). Moreover, maquiladora exports account for nearly half of Mexico's total exports and since 1998 the maquiladora industry has claimed the title of the top foreign-exchange generator for Mexico.

Citing studies by Patrick (1990), Sprinkle (1986), and Silvers and Pavlakovich (1994), Gilmer and Cañas (2005) note that maquiladora employment has important implications for U.S. counties along the Mexican border (see map in Fig 1). They explain that the just-in-time production method motivates many U.S. suppliers to relocate to the border counties. In addition, the growth of the cross-border trade leads to demand for transportation services, finance, legal, and administrative support (Gilmer and Cañas, 2005).

[4] The maquiladora program was originally called the Border Industrialization Program.

The composition of border-city employment differs from that at the national level. In particular, unemployment in the border-city cannot be explained by the national unemployment rate (Mollick, 2007). Economically, Texas border counties are on the periphery of the more successful metro areas known as the Texas Triangle, consisting of Dallas-Fort Worth, Houston, and San Antonio (Gilmer and Cañas, 2005). According to Gilmer and Cañas (2005), employment growth in the Texas border counties outperformed the rapid growth of the state economy in the 1990s. However, despite the job growth, border income levels showed no evidence of convergence to the national or statewide income levels (Gilmer and Cañas, 2005).

In one of a few available empirical studies on border counties, Hanson (2002) uses data from 1969-1992 to show that growth in export manufacturing in Mexico is significantly related to employment growth along six border-city pairs. More specifically, employment in both manufacturing and non-manufacturing industries in a U.S. border city increases following a raise in export manufacturing in a neighboring Mexican border city. Focusing on two Texas border counties (El Paso and Brownsville) Mollick, Cortez, and Olivas (2006) find that between 1990 and 2002, maquiladora production has had a stronger effect on the service industry than manufacturing in U.S. counties.

IV. Theoretical Considerations

A. Empirical Framework

Following Hanson (2001), we assume that derived demand for inputs from a U.S. city-industry is export production located in the neighboring city on the Mexican side of the border. As noted by Hanson (2001), the input demand is exogenous to consumer demand in the U.S. border city since majority of the maquiladora exports serves consumption elsewhere in the

United States. Due to advantages confer from geographic proximity we expect to find a positive relationship between employment in the neighboring U.S. border city and export from a Mexican border city. To the extent that exports from China displaces Mexico's export share in the U.S. market, Chinese exports should be negatively correlated with employment in the U.S. border city.

The framework follows the works of Grossman (1987), Revenga (1992), and Hanson (2001) in which we consider a competitive labor market in the U.S. border city. Labor supply and demand equate to determine the equilibrium level of employment and wages in the U.S. border city. Let i index the U.S. border city, j the industry, and t the year, the labor demand in U.S. border city-industry *ij*, L_{ijt}^{D} is a function of both domestic and foreign observable factors that shift labor demand in city-industry *ij*, wages in city-industry *ij*, and unobservable labor-demand shocks in city-industry *ij*. Namely, $L_{ijt}^{D} = f(Y_{itj}, Z_{ijt}, W_{ijt}, \sigma_{itj}^{D})$, where Y_{ijt} denotes observable domestic shocks to labor demand in city-industry *ij*, Z_{ijt} represents observable foreign shocks to labor demand in city-industry *ij*, W_{ijt} is wages in city-industry *ij*, and σ_{itj}^{D} is an unobserved shock to labor demand in city-industry *ij*. Labor supply in U.S. border city-industry *ij* at time *t* is defined as $L_{ijt}^{S} = f(SWG_{ijt}, W_{ijt}, \sigma_{itj}^{S})$, where SWG_{ijt} is the alternative wage available to workers in city-industry *ij* and σ_{itj}^{S} denotes an unobserved shock to labor supply in city-industry *ij*.

Hanson (2002) derives the reduced-form equations for equilibrium city-industry employment and wages by setting labor demand equal to labor supply. As our focus is to evaluate how increased U.S. imports from China affect demand-linkages developed between the U.S.-Mexican border counties, we extend the empirical framework in Hanson (2002) to include

the our focus trade variables for Mexico and China. Our hypothesis is that an increase in imports from China may be inversely related to the demand for inputs in U.S. border counties that are linked to export manufacturing in neighboring Mexican cities. Equation (1) below presents our empirical specification for employment:

$$\ln L_{ijt} = \alpha_0 + \alpha_1 \ln SWG_{ijt} + \alpha_2 \ln INC_{ijt} + \alpha_3 \ln USL_{ijt} + \alpha_4 \ln MXIM_{ijt} + \alpha_5 \ln CHIM_{ij(t-1)} + \alpha_6 \ln BUS_{it} + \alpha_7 \ln EXCH_{it} + \eta_{ijt} \quad (1)$$

Similarly, equation (2) below is our empirical specification for the effect of competition from China on wages is U.S.-Mexico border counties:

$$\ln W_{ijt} = \beta_0 + \beta_1 \ln SWG_{ijt} + \beta_2 \ln INC_{ijt} + \beta_3 \ln USL_{ijt} + \beta_4 \ln MXIM_{ijt} + \beta_5 \ln CHIM_{ij(t-1)} + \beta_6 \ln BUS_{it} + \beta_7 \ln EXCH_{it} + \mu_{ijt} \quad (2)$$

where η_{ijt} and μ_{ijt} capture components of employment and wage variation that are unmeasured. The dependent variable in equation (1), $\ln L_{ijt}$, is defined as the log of annual average employment in three-digit industries located in U.S. border city. Similarly, the dependent variable in equation (2), $\ln W_{ijt}$, is computed as the log of total annual wages for three-digit industries located in the U.S. border city. We deflate the wage variable by the U.S. CPI.

Independent variables in equations (1) and (2) include the following. $\ln SWG_{ijt}$ is the alternative wage for workers in a U.S. city-industry. This variable is calculated using the average annual pay for workers at the state level, deflated by the U.S. CPI, excluding the MSA on which the observation is taken. Date for $\ln SWG_{ijt}$ at the 3-digit industry level. We also include two variables that measure shifts in domestic demand for city-industry output. The first of these is personal income in the state in which the MSA is located, $\ln INC_{ijt}$. This variable is deflated by the U.S. CPI and is included as a measure of local demand for goods and services. We construct

this variable using total annual wages at the state level but excluding the MSA on which the observation is taken to avoid introducing simultaneity in the measure.

In addition, we include national industry labor demand, $\ln USL_{ijt}$. This variable measures total employment in the national industry excluding the state in which the MSA is located to avoid creating simultaneity between national industry employment and the alternative wage. Here, national-industry employment captures national-industry labor-demand shocks.

Foreign demand for outputs produced in a U.S. border city is measured by Mexican exports through the closest port. Specifically, $\ln MXIM_{ijt}$, measures import by the U.S. from Mexico coming through ports adjacent to the U.S. border city on which the observation is taken. To capture Chinese competition, we included $\ln CHIM_{ij(t-1)}$ which measures lagged U.S. imports from China coming through the land ports located in, or adjacent to, the U.S. border county on which the observation is taken. If Chinese exports serve to replace Mexico's export share in the U.S. market, we would expect a negative estimated coefficient on employment and wages in the U.S. border city.

Finally, we include a variable, $\ln BUS_{it}$ which serves as a proxy for the U.S. business cycle. We estimate two separate specifications using different measures for the U.S. business cycle. The first is lagged values of the Industrial Production Index which captures the majority of the variation in U.S. national output over the duration of the business cycle. The second proxy for the business cycle is imports from China coming through the land port of Detroit, MI. We see this as an important measure in the case of the Maquiladora industries because, traditionally, this state has been a major supplier of inputs (U.S. exports) to the plants located in U.S. border sister cities. With almost all of the maquiladora output destined for the U.S. market, fluctuations in the U.S. economy will have a cyclical impact on Mexican exports.

To control for unobserved city-industry or time-specific factors that affect labor demand and supply, we include fixed city-industry effects and time dummy variables in the estimation. These shocks may include frequent delays in port crossing in a border city but not in others. Changes in Mexican tax codes over the years will be capture by the time dummies. In addition to fixed effects, we may obtain consistent estimates of the foreign demand shocks using instrumental variables. Valid instruments to correct for potential correlation between $\ln MXIM_{ijt}$ and the error terms, η_{ijt} and μ_{ijt}, include lagged values of $\ln MXIM_{ijt}$ and the exogenous independent variables.

B. Data

Our data runs from 1990 to 2006, covering four U.S. border-counties: San Diego, CA, Nogales, AZ, El Paso, TX, and Laredo, TX. We also include Wayne County (Michigan) because Detroit, which is located in this Midwestern state, is one of the primary suppliers to the maquiladoras (Gilmer and Cañas, 2005). The data on employment and wages at the county, state, and national levels is available online from the Bureau of Labor Statistics (BLS) by three-digit North American Industry Classification System (NAICS). The industries we examine include agriculture, mining, and manufacturing. We include employment and wage observations from both private and government establishments our sample.

U.S. port imports from Mexico and China are from Foreign Trade Division of the U.S. Census Bureau. The trade data is available in 6-digit Harmonized System (HS) and is converted to the three-digit NAICS manually via the International Standard Industrial Classification (ISIC).[5]

[5] Concordance is available upon request.

IV. Empirical Results

A. The Effect of U.S. – China Trade on Employment in U.S.-Mexico Border Counties

Table 2 reports fixed effects coefficient estimates of equation (1) which seeks to empirically document the effect of U.S.-China trade on employment in four U.S.–Mexico border counties: San Diego CA, Nogales, AZ, Laredo, TX, and El Paso TX. We report three specifications: column (1) provides a benchmark estimation of the results without a control measure for the U.S. business cycle, while columns (2) and (3) include such a measure with two different proxies. In Column (2) we use lagged values of the U.S. Industrial Production Index and in Column (3) we use U.S. imports from China coming through the Detroit, MI land port[6]. In all three specifications, the results are generally consistent with our expectations. The coefficient on the alternative wage is negative and significant throughout suggesting that employment in U.S.-Mexico border counties declines as the opportunity cost of seeking employment in these counties increases. In addition, the coefficient on personal income is positive and highly significant throughout which is consistent with our expectation that higher local demand for goods and services is related to higher employment.

Our focus variables measuring imports from Mexico (lnMXIM) and China (lnCHIM) through ports located in each of the four counties are also significantly correlated with employment and in the expected direction. Specifically, the estimated coefficients on Mexican imports are positive and significant throughout which is consistent with the hypothesis that export manufacturing growth in maquiladoras contributes to growth in U.S. border counties. In addition, we find a significant correlation between employment in these counties and imports from China. The estimated coefficients of lnCHIM are negative and significant throughout

[6] We also estimated equations (1) and (2) with U.S. output growth as a proxy for the U.S. business cycle but results are qualitatively the same and remain robust to this specification.

providing support for our hypothesis that Chinese exports replace Mexico export share in the U.S. market.

B. The Effect of U.S. – China Trade on Wages in U.S.-Mexico Border Counties

Table 3 reports fixed effects coefficient estimates of equation (2) which we estimate to evaluate the effect of U.S.-China trade on wages in the four counties U.S.–Mexico border counties. Once again we present three specifications, which as described above, provide sensitivity analysis with respect to controls for the U.S. business cycle. An increase in the alternative wage is expected to increase the wage in the county the observation is taken on. However, in our estimation the estimated coefficient on the alternative wage comes in negative and highly significant which is unexpected. One possibility is that empirically, the alternative annual wage in a state serves as a proxy for state specific shocks that are different from those at the national level. This may also be the case in the employment results presented above. However, exclusion of this variable, and the effects it controls for, deteriorates the quality of the estimated coefficients significantly suggesting an omitted variable problem. We therefore include the alternative wage measure in all estimations of Equation (2).

Signs of estimated coefficients on the remaining variables in Table 3 are as expected. The coefficient on personal income enters the positive and significant in all specifications supporting the expectation that as demand for local goods and services increase so does labor demand and consequently wages of city-industry workers, on average. Our focus variable are also of the expected sign and highly significant throughout. The positive estimated coefficients on Mexican imports support our hypothesis that maquiladora production serves to boost economic activity in the four U.S. border counties, and is positively related to the increase in wages in these areas. In contrast, the negative estimated coefficients on imports from China again speak to a substitution

effect: an increase in imports from China is associated with a decrease in wages in U.S. – Mexico border counties. As with the results from estimating Eq. (1), here too we find that controls for national shocks to the U.S. economy such as employment in the national industry, U.S. business cycle measures and U.S. – Mexico exchange rate are not significantly related to the variation in wages along the U.S. –Mexico border.

C. Cross-County Comparison of Wage and Employment Effects

In an effort to establish the relative impact that U.S.-China trade has on U.S. border counties we include a fifth county in out dataset, namely, Wayne, MI which serves as a benchmark. Table 4 reports the OLS estimation results for equations (1) and (2) which explicitly estimates the county fixed effects. Specifically, our models indicate that controlling for the influences of our focus and control variables, employment in the four U.S.-Mexico border counties is consistently lower in that in Wayne, MI. With the exception of San Diego, CA, the estimated coefficients are highly significant while employment is lower in San Diego relative to Wayne, MI it is not significantly so as the San Diego economy is not as heavily dependent on manufacturing as the remaining counties (citation). However, as column (2) shows, wages are consistently significantly lower for all U.S. –Mexico border counties when compared with MI. Overall we conclude that the adverse effect on the economy of the border counties is significantly more pronounced than it is in the interior of the country.

V. Conclusions and Future work

In this study we set to investigate the effect of increased U.S.-China trade, and specifically imports, on employment and wages in U.S.-Mexico border counties. We adopt a simple empirical framework for equilibrium wages and employment and estimate these relationships

using disaggregated data at the 3-digit NAICS level for 29 industries over the sample period 1992-2006. Our industries include agriculture mining and manufacturing. Using fixed effects estimation we find that the effect of higher Chinese import competition is significantly related to lower employment and lower wages in U.S.-Mexico border counties. These effects are robust across specifications that use different proxies for changes in the U.S. business cycle. In addition, we find that the impact of Chinese import competition is stronger for economic areas that are more reliant on manufacturing such as Nogales, AZ, El Paso, TX, and Laredo TX. In contrast the China effect is less pronounced for San Diego whose economy is much more diversified into the service and hi-tech industries.

In terms of policy implications, our results suggest that it is vital for the current debate on immigration reform to include the U.S.-China trade policies. To the extent China's economy is now a destination for the same type of production activity that the maquiladoras traditionally performed, displacement of Mexican workers from these industries contributes to higher legal and illegal immigration. In future work, this motivates an inquiry into how changes in maquiladora output are related to the growth in U.S.-China imports. Specifically, a next step in the study of the effect of China on employment and wages in U.S.-Mexico border counties will be to use maquiladora output in the neighboring Mexican counties instead of Mexican exports to the U.S. to measure foreign demand. This analysis will be possible since there exist data on maquiladora output from the Mexico National Institute of Statistics, Geography, and Information (INEGI). This data is available from 1990-2004 at the one-digit level. Thus a comparison and robustness check to the results in this paper would be possible.

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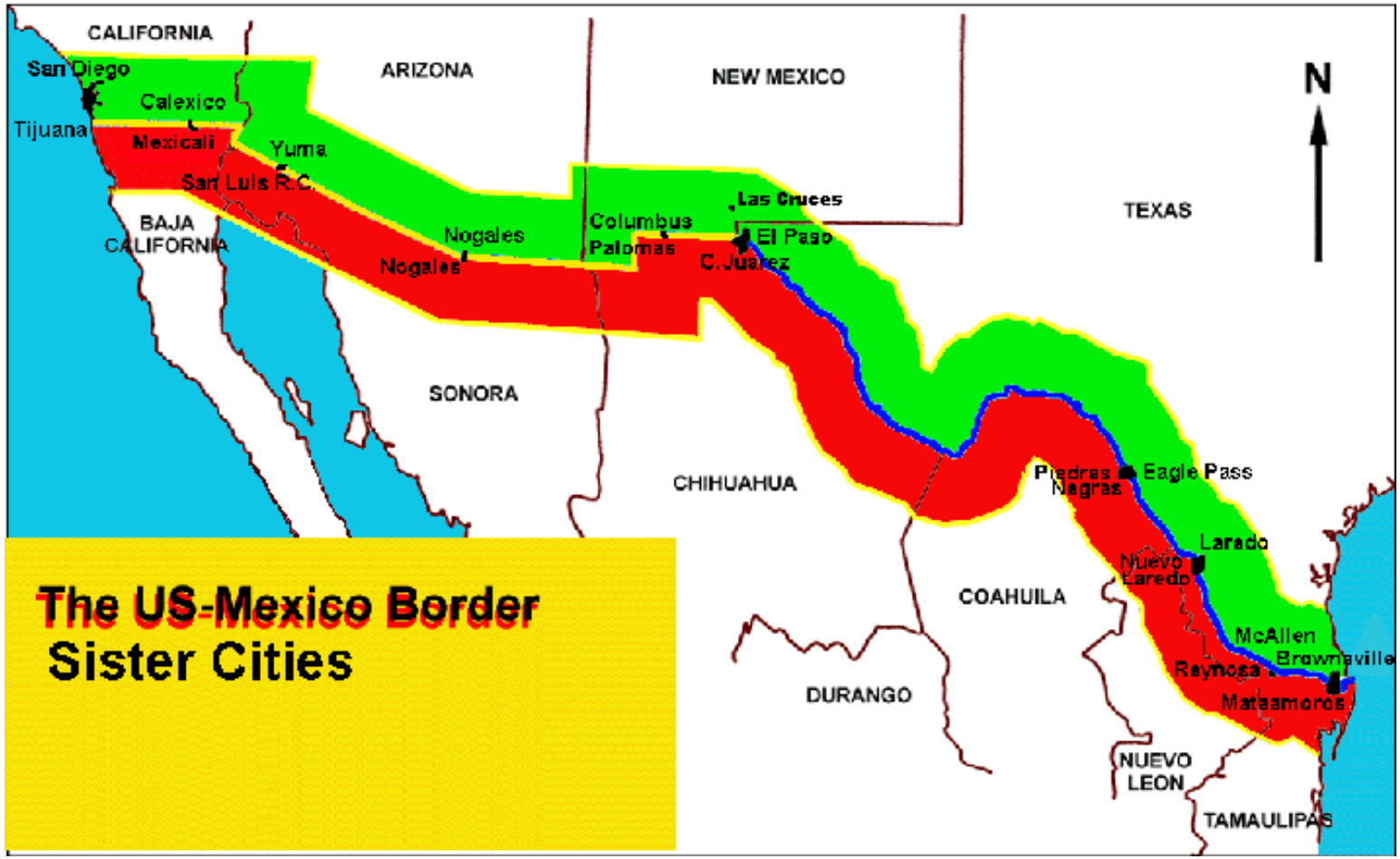
Figure 1: U.S. Mexico Border Sister Cities



Source: Pan American Health Organization

Table 1. Variable Definitions and Data Sources.

Variable	Definition	Data Source
lnL_{ijt}	Log annual average employment for three-digit industries located in U.S. border MSAs.	Bureau of Labor Statistics
lnW_{ijt}	Log average wage for three-digit industries located in U.S. border MSAs. Variable is calculated as annual payroll per worker, deflated by the U.S. CPI	Bureau of Labor Statistics
$lnSWG_{ijt}$	the alternative wage for workers in a U.S. city-industry (calculated as the average wage for workers in the industry at the state level, deflated by the U.S. CPI, excluding the MSA on which the observation is taken.	Bureau of Labor Statistics
$lnINC_{ijt}$	Personal income in the state in which the MSA is located (INC_{ijt}) is deflated by the U.S. CPI, excluding the MSA on which the observation is taken.	Bureau of Labor Statistics
$lnUSL_{ijt}$	Total employment in the national industry, excluding the state in which the MSA is located.	Bureau of Labor Statistics
$InMXIM_{it}$	Mexican exports to the U.S. coming through the port nearest to the MSA on which the observation is taken.	U.S. Census Bureau: Foreign Trade Division
$lnCHIM_{i,t-1}$	Lagged U.S. imports form China coming through the port nearest to the MSA on which the observation is taken.	U.S. Census Bureau: Foreign Trade Division
$lnBUS_{it}$	Value added for three-digit industries located in U.S. deflated by the U.S. PPI	Bureau of Labor Statistics
Exch	U.S. Mexico exchange rate	U.S. Federal Reserve

Table 2. The Effect of U.S-China Trade on Employment in Four U.S-Mexico Border Counties: Fixed Effects Estimation

Fixed effects results for employment in counties that contain US-Mexico border cities: Nogales, AZ, San Diego CA, El Paso, TX, and Laredo TX. Sample comprises 29 industries in agriculture and manufacturing industries over 15 years (1992-2006). The dependent variable is log employment for three-digit industries located in U.S. border counties. Model (1) provides estimates with no controls; model (2) provides estimates with industry dummies; model (3) provides estimates with industry and time dummies. Standard errors are in parentheses below the coefficient estimates. ***, **, and * indicate coefficient estimates are significantly different from zero at the 1%, 5%, and 10% levels.

Dependent: Log (Total Employment)	**Model (1) (4 MSAs LagIP)**	**Model (3) (4 MSAs No LnBUS)**	**Model (5) (4MSAs-LagMI)**
Intercept	-5.430 (4.81)	-6.600* (3.447)	-6.564* (3.510)
Alternative Wage ($lnSWG_{ijt}$)	-0.331*** (0.044)	-0.332*** (.043)	-0.344*** (0.044)
Personal Income ($lnINC_{ijt}$)	0.629*** (0.122)	0.664*** (0.109)	0.682*** (0.110)
Employment, National Industry ($lnUSL_{ijt}$)	0.155 (0.330)	0.149 (0.234)	0.051 (0.247)
U.S. Imports from Mexico ($lnMXIM_{ijt}$)	0.127*** (.045)	0.154*** (0.042)	0.146*** (0.043)
U.S. Imports from China ($lnCHIM_{(i,jt-1)}$)	-0.075*** (0.020)	-0.071*** (0.020)	-0.078*** (0.021)
U.S. Business Cycle ($lnBUS_{it}$)	0.0001 (0.002)		0.082 (0.053)
U.S.–Mexico Exchange Rate (exch)	0.008 (0.022)	0.001 (0.020)	-0.019 (0.024)
Industry Dummies	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes
Number of Observations	569	590	579
R-Square	0.6705	0.6815	0.6669
Model P-Value	<0.0000	<0.0000	<0.0000

Table 3: The Effect of U.S-China Trade on Wages in U.S-Mexico Border Counties: Fixed Effects Estimation

Fixed effects results for employment in US-Mexico border counties that contain the following cities: Nogales, AZ, San Diego CA, El Paso, TX, and Laredo TX. The dependent variable is log employment for three-digit industries located in U.S. border MSAs. Standard errors are in parentheses below the coefficient estimates. ***, **, and * indicate coefficient estimates are significantly different from zero at the 1%, 5%, and 10% levels.

Dependent Variable: Log(Total Annual Wages)	**(1) (4 MSAs LagIP)**	**(3) (4 MSAs No LnBUS)**	**(5) (4MSAs-LagMI)**
Intercept	1.171	-2.416	-2.451
	(5.187)	(3.726)	3.798
Alternative Wage	-0.494***	-0.486***	-0.500***
($lnSWG_{ijt}$)	(0.048)	(0.046)	(0.0476)
Personal Income	0.871***	0.852***	0.872***
($lnINC_{ijt}$)	(0.132)	(0.118)	(0.119)
Employment, National Industry	-0.232	0.012	-0.080
($lnUSL_{ijt}$)	(0.356)	(0.253)	(0.267)
U.S. Imports from Mexico	0.157***	0.177***	0.170***
($lnMXIM_{ijt}$)	(0.048)	(0.046)	(0.046)
U.S. Imports from China	-0.077***	-0.074***	-0.081***
($lnCHIM_{(i,jt-1)}$)	(0.022)	(0.021)	(0.022)
U.S. Business Cycle	0.002		0.079
($lnBUS_{it}$)	(0.002)		(0.057)
U.S.–Mexico Exchange Rate	0.008	0.012	-0.007
(exch)	(0.023)	(0.021)	(0.026)
Industry Dummies	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes
Number of Observations	569	590	579
R-Square	0.7143	0.7186	0.7114
Model P-Value	<0.0000	<0.0000	<0.0000

Table 4. The Effect of U.S-China Trade on Employment and Wages in U.S-Mexico Border Counties: 5 County OLS Estimation

Fixed effects results for employment in US-Mexico border counties: Nogales, AZ, San Diego CA, El Paso, TX, and Laredo TX. Standard errors are in parentheses below the coefficient estimates. ***, **, and * indicate coefficient estimates are significantly different from zero at the 1%, 5%, and 10% levels.

	Employment Model	**Wage Model**
Intercept	-0.878	5.674
	(4.588)	(5.087)
Alternative Wage	-0.298***	-0.433***
($lnSWG_{ijt}$)	(0.039)	(0.042)
Personal Income	0.544***	0.805***
($lnINC_{ijt}$)	(0.084)	(0.090)
Employment, National Industry	0.093	-0.276
($lnUSL_{ijt}$)	(0.311)	(0.336)
U.S. Imports from Mexico	0.065**	0.087**
($lnMXIM_{ijt}$)	(0.033)	(0.035)
U.S. Imports from China	-0.052***	-0.050**
($lnCHIM_{(i,jt-1)}$)	(0.019)	(0.021)
U.S. Business Cycle	.001	0.002
($lnBUS_{it}$)	(.002)	(0.002)
U.S.–Mexico Exchange Rate	-0.002	-0.0003
(exch)	(0.020)	(0.022)
Santa Cruz, AZ	-3.694***	-3.944995***
	(0.214)	.2368375
San Diego, CA	-0.295	-.8133247***
	(0.263)	.2740524
El Paso, TX	-0.977***	-1.538752***
	(0.239)	.2509323
Webb, TX	-3.508***	-4.314787***
	(0.279)	.2895851
Industry Dummies	Yes	Yes
Time Dummies	Yes	Yes
Number of Observations	645	645
R-Square	0.8852	0.9016
Model P-Value	<0.0000	<0.0000