Wage Convergence and Texas-Mexican Economic Integration

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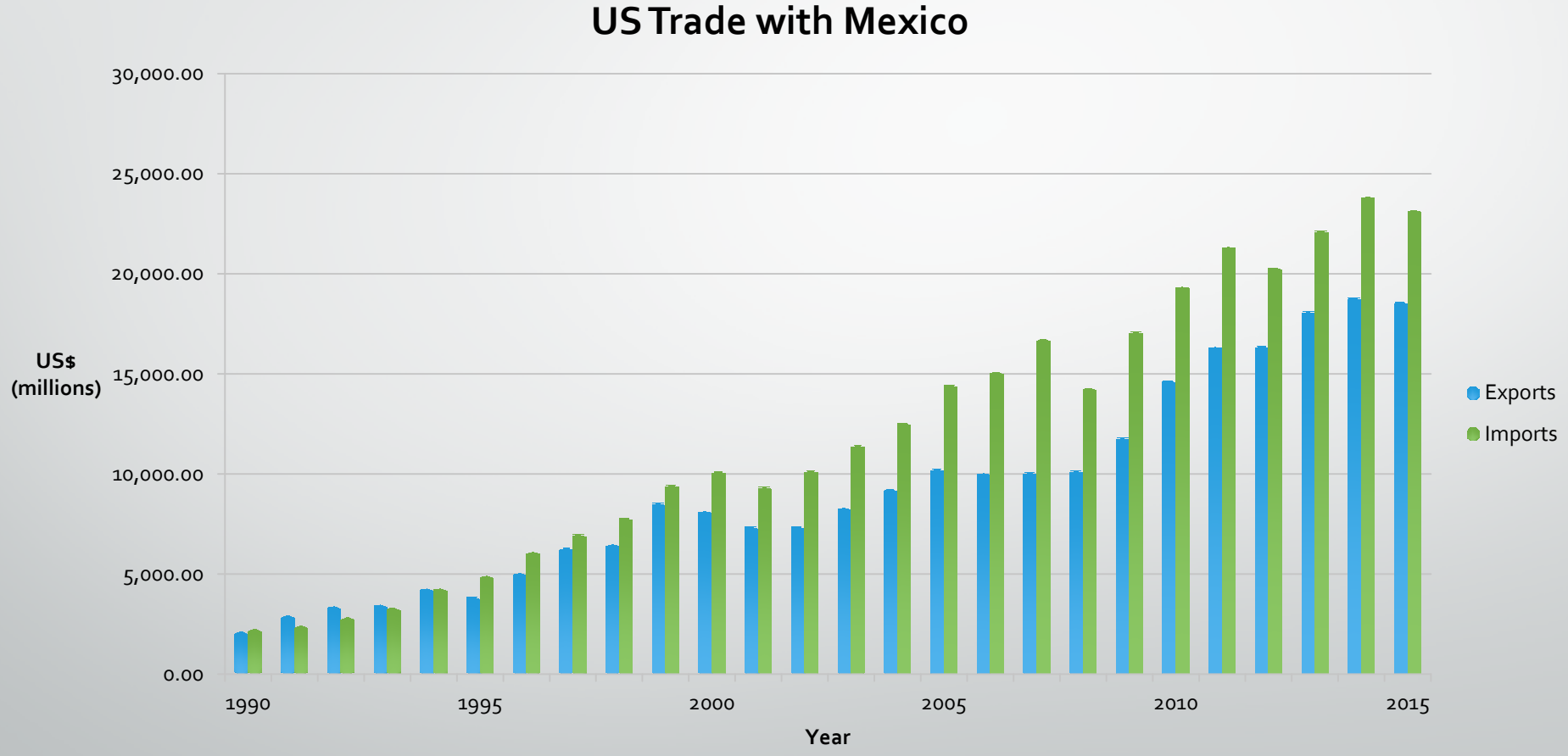
Motivation:
Wage Convergence and Economic Integration

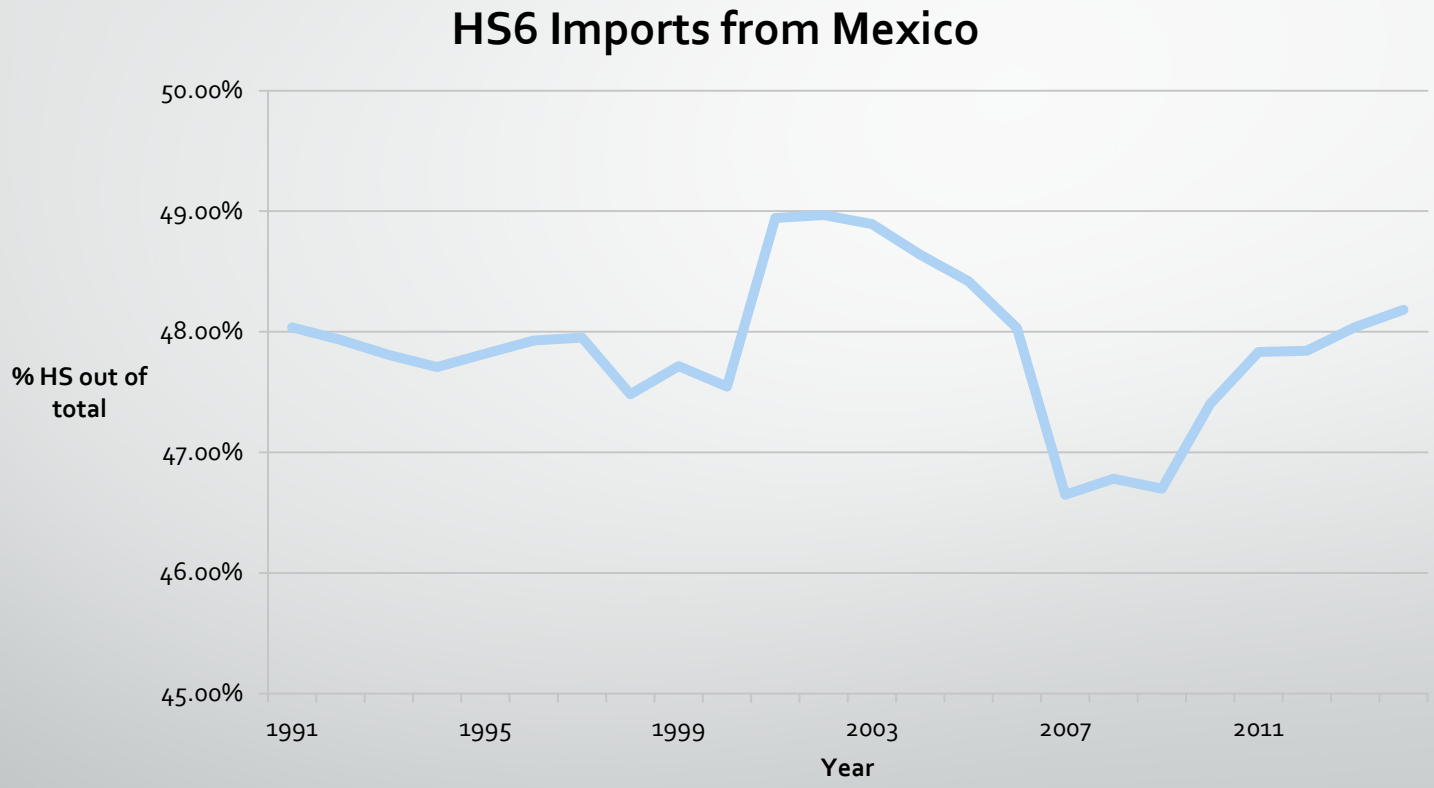
- Trade theory (e.g. HOS, but also extensions) suggests that trade integrates factor markets
- Labor Economics suggests that FDI and migration can also integrate factor markets
- Factor market integration – wage convergence – is a main motivation for pursing trade agreements (at least in Mexico!)
- US-Mexican trade, investment, and migration have increased significantly since NAFTA
- Texas and Mexico are especially integrated
- What has happened with wage convergence between Mexico and the U.S. generally and Texas in particular?

Total U.S.-Mexican Trade Flows



Source: https://www.census.gov/foreign-trade/balance/c2010.html

6 HS Category Imports



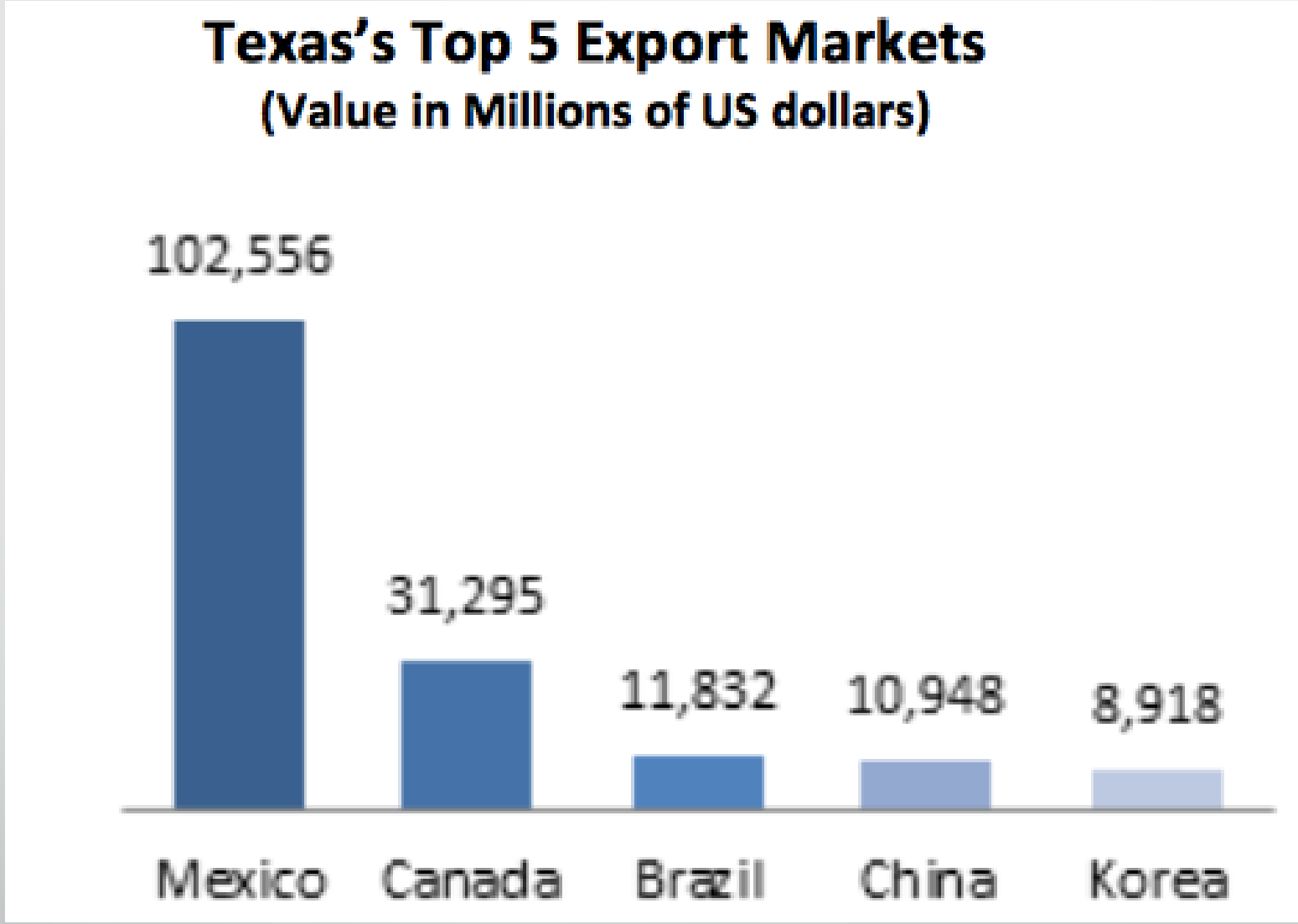
Texas Exporting Companies

- In 2008, more than 26,000 companies exported goods from Texas
- 41,558 companies exported from Texas in 2013
- Texas posted merchandise exports of $102.6 billion to Mexico in 2014, representing 35.6% of the state's total merchandise exports.
- More than 90% of all Texas exporters are small businesses

http://www.trade.gov/mas/ian/statereports/states/tx.pdf

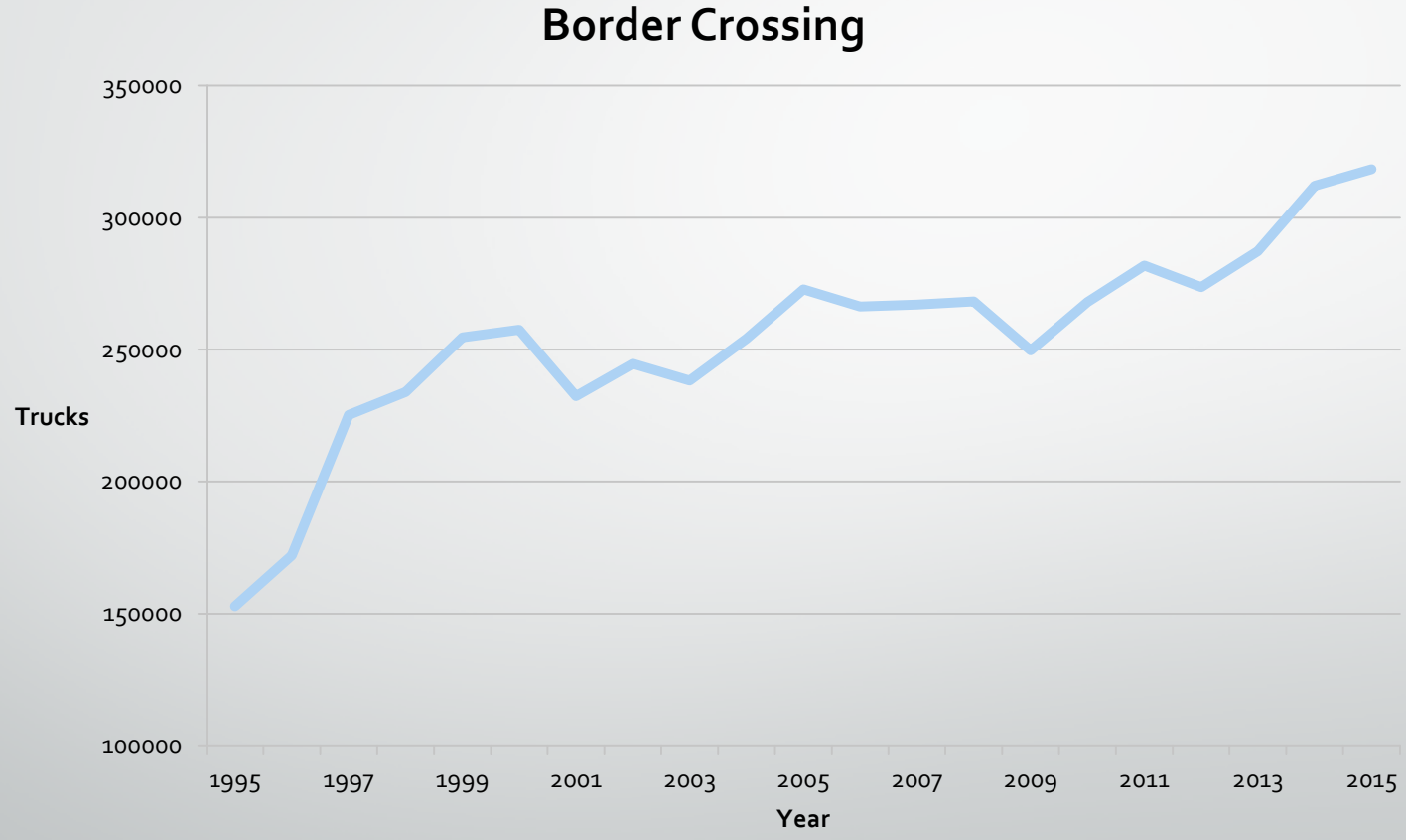
http://thetexaseconomy.org/business-industry/trade-logistics/articles/article.php?name=texas-world-trade

https://texaswideopenforbusiness.com/small-business/trade-exports

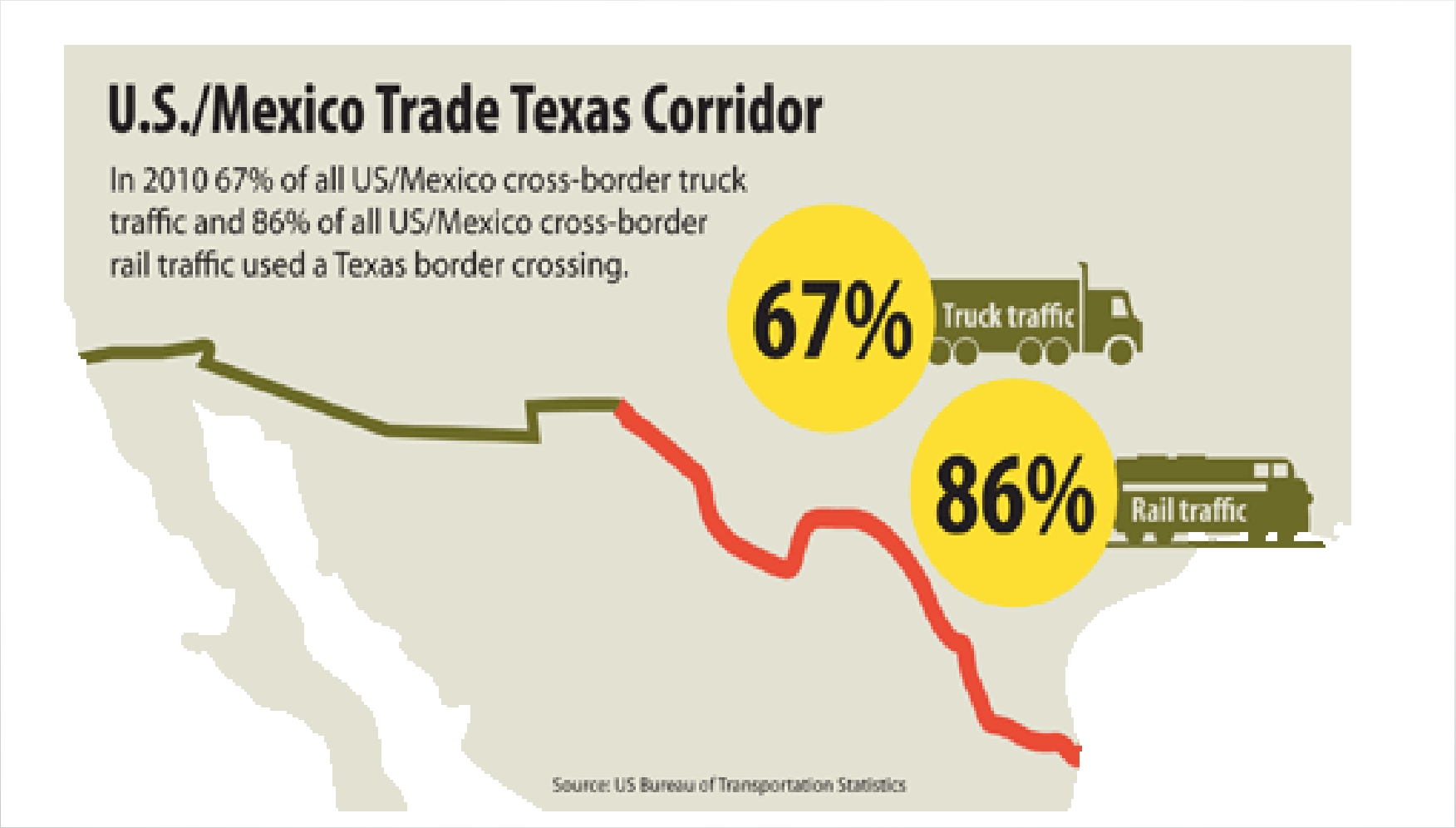


Source: http://www.trade.gov/mas/ian/statereports/states/tx.pdf

Border Crossing Data



Source: http://transborder.bts.gov/programs/international/transborder/TBDR_BC/TBDR_BC_QuickSearch.html

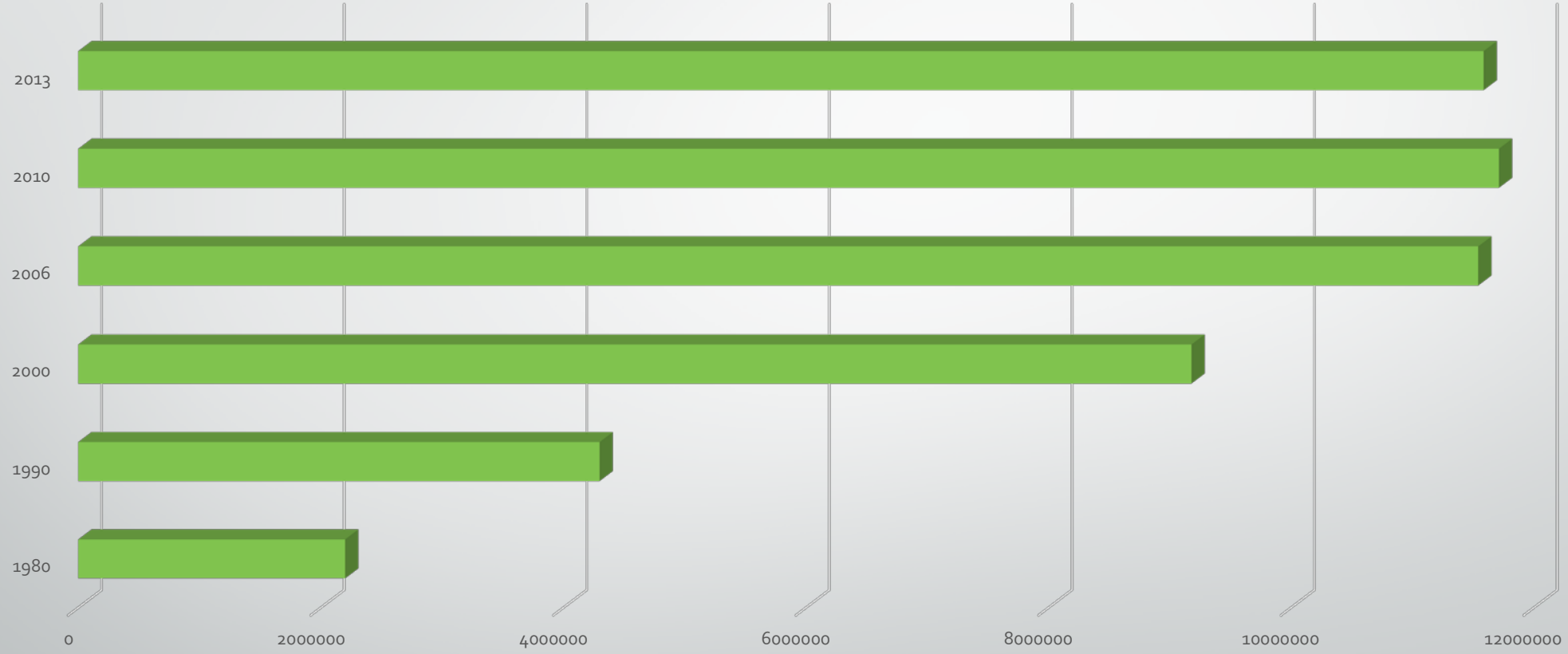


Source: http://thetexaseconomy.org/business-industry/trade-logistics/border-trade/index.php

Maquiladoras in Mexico

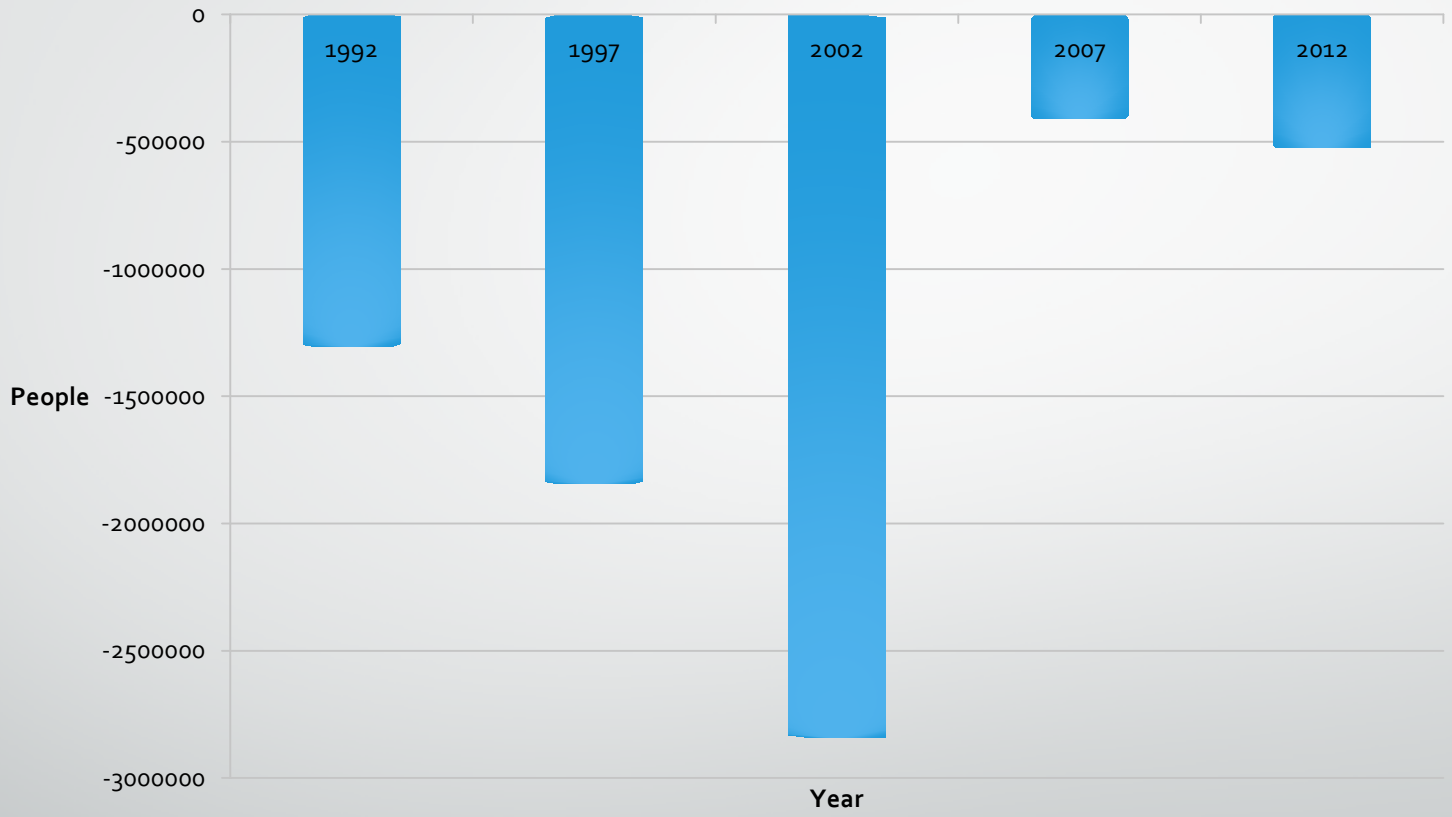
- Almost all maquiladoras are directly or indirectly owned by U.S. firms. About 40 percent of the more than 3,000 maquiladoras are American-owned, and nearly half are Mexican-owned subsidiaries of U.S. corporations. (Legislative Finance Committee)
  - http://www.nmlegis.gov/lcs/lfc/lfcdocs/finance%20facts%20maquiladora.pdf
- 3,000 maquiladora plants in Northern Mexico (Matt Rosenberg)
  - http://geography.about.com/od/urbaneconomicgeography/a/maquiladoras.htm
- 30% of Mexico's labor force in maquiladora program. (Kimberly Amadeo 2016)
  - http://useconomy.about.com/od/tradepolicy/p/NAFTA_Problems.htm

Mexican Immigrant Population in the United States



Source: Data from U.S. Census Bureau 2006, 2010, and 2013 American Community Surveys (ACS), 2000 Decennial Census, and Campbell J. Gibson and Emily Lennon, "Historical Census Statistics on the Foreign-born Population of the United States: 1850-1990" (Working Paper No. 29, U.S. Census Bureau, Washington, DC, February 1999), www.census.gov/population/www/documentation/twps0029/twps0029.html.

Net Migration: Mexico

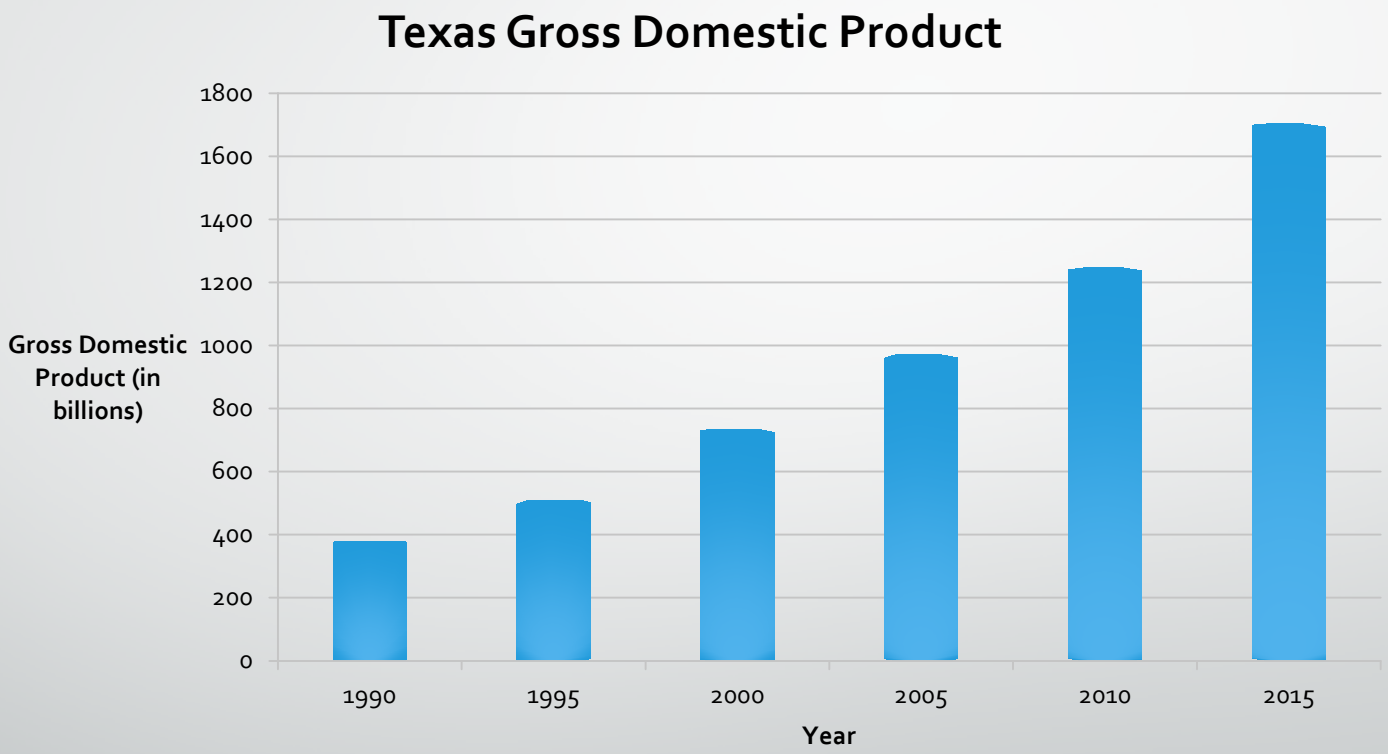


Source: http://data.worldbank.org/indicator/SM.POP.NETM

Mexico GDP

Source: http://data.worldbank.org/indicator/NY.GDP.PCAP.CD

Texas GSP



Source: http://www.usgovernmentspending.com/compare_state_spending_2015bZ0a

Relevant Literature

- Measuring market integration
  - Products: Barrett (2001), Engel and Rogers (1994) , Beghin and Fang (2001) , Dawson and Dey (2002)
  - Capital markets: Oh (2003), Beck and Subramanian (1996)
- Measuring labor market integration
  - Wage convergence: Bloom and Noor (1995), Boyer and Hatton (1994)
  - Co-movements in wage rates
- Do trade agreements contribute to market integration
  - Product markets: Paul, Miljkovic and Ipe (2001)
  - Financial Markets
  - Labor markets: Venables (2003), Echandi (2001), Knetter and Slaughter (2001), Bloom and Noor (1995)

Theoretic Foundation

$$L_{jt}^{dA} = \delta_0 + \delta_1 w_{jt-1}^{B} - \delta_2 \left[w_{jt}^{A} - \gamma w_{jt-1}^{A} \right] + \delta_{3j}$$

$$L_{jt}^{sA} = \sigma_0 - \sigma_1 w_{(jt-1)}^{B} - \sigma_2 [w_{jt}^{A} - \varphi w_{(jt-1)}^{A}] + \sigma_{3j}$$

$$\delta_0 + \delta_1 w_{jt-1}^{B} - \delta_2 \left[w_{jt}^{A} - \gamma w_{jt-1}^{A} \right] + \delta_{3j} = \sigma_0 - \sigma_1 w_{jt-1}^{B} - \sigma_2 \left[w_{jt}^{A} - \varphi w_{jt-1}^{A} \right] + \sigma_{3j}$$

$$\Delta w_{jt}^{A} = \alpha_0 + \alpha_1 \Delta w_{jt}^{B} + \alpha_2 \left(w^{A} - w^{B} \right)_{jt-1} + \mu_{jt}$$

Empirical Approach

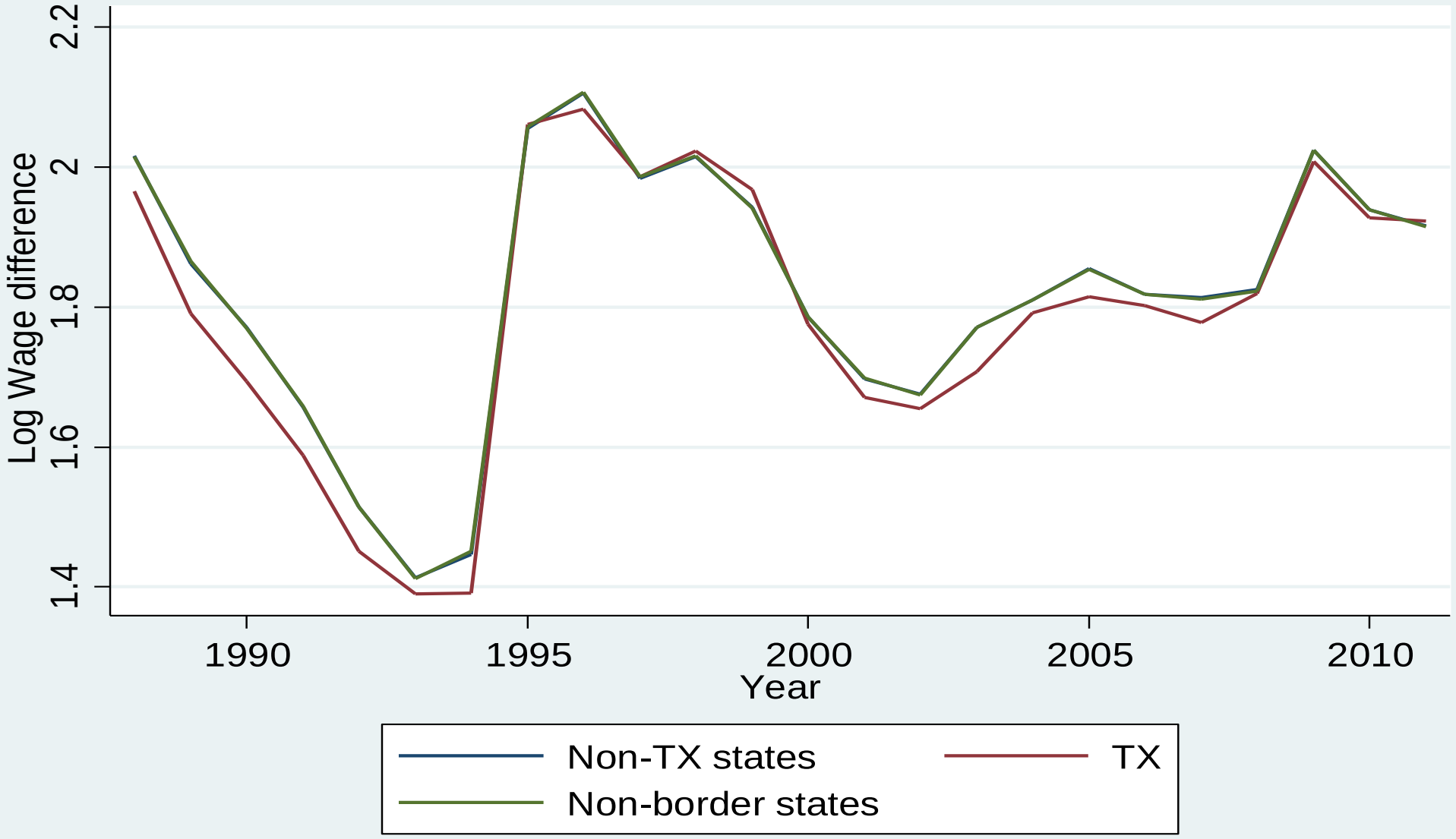
- Wage differentials between pairs
- Dispersion of differentials over time
- Convergence over time

Data

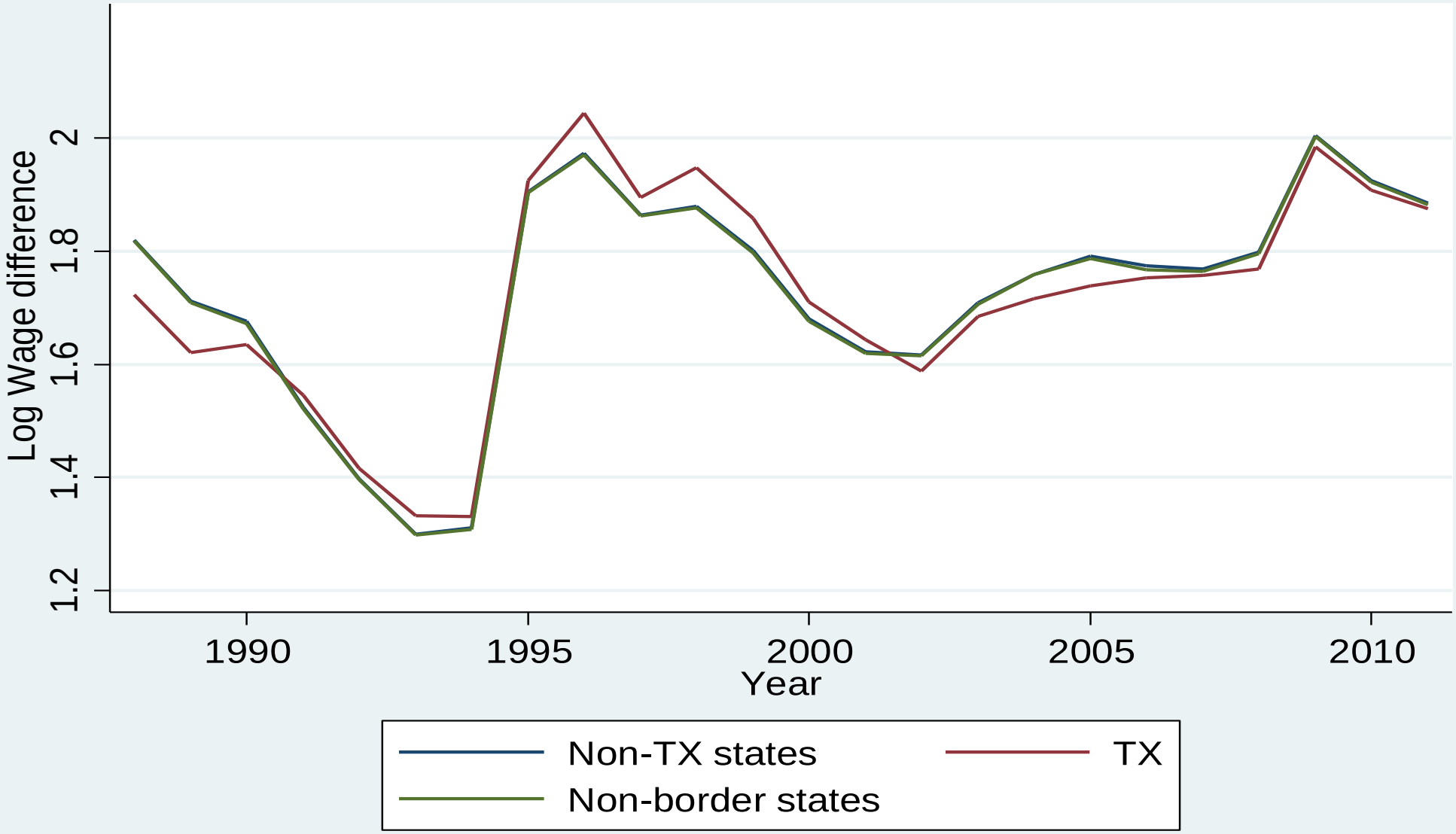
- Household survey data
  - Texas (U.S. CPS MORG)
  - United States (U.S. CPS MORG)
  - Mexico (ENEU, ENE, ENOE)
- Collapse data to age-education cells
  - Mean wages for each cell
  - Match the cells across borders and state pairs
- Take the absolute difference of the ratio for each country pair
  - Convergence implies trend towards mean, or towards zero in our measure
  - Does not identify falling top values or rising bottom values

Cohort Definitions

- Five age groups (18-26, 27-35, 37-45,46-53, and 54-65)
- Five education groups based on years of education (1-5, 6-8, 12-15, and more than 16 years).
- Using sample weights, we generate the mean of PPP-adjusted 2005 dollar-value monthly earnings for each cell.
- These cells are identified by age, education, country/state, and time period (quarters in the short-run analysis).


Wage Differentials Relative to Mexico for Male
Log Wage difference
1.4
1.6
1.8
2
2.2
1990
1995
2000
2005
2010
Year
Non-TX states
Non-border states
TX

Wage Differentials Relative to Mexico for Female



Short-run: Error Corrections Model

$$\Delta w^{A}_{jt} = \alpha_0 + \alpha_1 \Delta w^{B}_{jt} + \alpha_2 \left(w^{A} - w^{B} \right)_{jt-1} + \mu_{jt}$$

- Pool all pairs A and B
- The first term represents the responsiveness to shocks from other countries
- The second term represents the speed back to the long-run differential

Mean Log Wage Differentials			
(Standard Deviations in Parentheses)			
Males			
	1988-1995	1996-2003	2004-2011
MX-Texas	1.700	1.817	1.861
	(0.359)	(0.284)	(0.283)
MX-Not Texas	1.754	1.828	1.879
	(0.430)	(0.360)	(0.363)
MX-Nonborder	1.755	1.828	1.868
	(0.433)	(0.363)	(0.366)

Error Correction Model of Shocks in Log Wages			
Texas/Non-Texas/Non-border			
Male			
	(1)	(2)	(3)
VARIABLES	Texas	Non-Texas	Nonborder
Change in States	0.521***	0.356***	0.352***
	(0.0278)	(0.0162)	(0.0162)
Lagged Diffrence	-0.203***	-0.170***	-0.169***
	(0.0393)	(0.0241)	(0.0238)
Constant	-0.495***	-0.431***	-0.428***
	(0.0732)	(0.0472)	(0.0467)
Observations	4,786	231,581	216,975
R-squared	0.144	0.195	0.194

Wage Differentials: Female			
	1988-1995	1996-2003	2004-2011
MX-Texas	1.614	1.768	1.822
	(0.398)	(0.348)	(0.342)
MX-Not Texas	1.634	1.767	1.856
	(0.484)	(0.441)	(0.432)
MX-Nonborder	1.632	1.766	1.854
	(0.486)	(0.445)	(0.435)

Error Correction Results: Females			
	(1)	(2)	(3)
VARIABLES	Texas	Non-Texas	Nonborder
Change in States	0.660***	0.375***	0.371***
	(0.0235)	(0.0131)	(0.0128)
Lagged Diffrence	-0.192***	-0.162***	-0.161***
	(0.0298)	(0.0184)	(0.0182)
Constant	-0.500***	-0.433***	-0.431***
	(0.0548)	(0.0361)	(0.0358)
Observations	5,160	217,603	203,016
R-squared	0.201	0.189	0.188

Long Run: Trend Analysis

- In the long run, $\Delta w_{jt}^{A} = 0$, $\Delta w_{jt}^{B} = 0$, and $(w^{A} - w^{B})_{jt-1} = (w^{A} - w^{B})_{jt}$
- We impose this restriction and solve for $(w^{A} - w^{B})_{jt}$:

$$(w^{A} - w^{B})_{jt} = -\left(\frac{\alpha_0}{\alpha_2}\right)_{jt} + \varepsilon_{jt}$$

- Estimation strategy focuses on the time-series and cross-section properties of this expression for groups *j* at time *t.*

Trend Results: Education	Males		
	(1)	(2)	(3)
VARIABLES	Texas	Non-Texas	Nonborder
Ed 6-8 yrs	-0.058***	-0.025**	-0.023**
	(0.009)	(0.009)	(0.009)
Ed 9-11 yrs	-0.177***	-0.151***	-0.150***
	(0.015)	(0.016)	(0.016)
Ed 12-15 yrs	-0.045**	-0.060***	-0.060***
	(0.017)	(0.018)	(0.018)
Ed 16+ yrs	0.038	-0.055**	-0.057**
	(0.025)	(0.026)	(0.026)

Trend Results: Education	Females		
	(1)	(2)	(3)
VARIABLES	Texas	Non-Texas	Nonborder
Ed 6-8 yrs	-0.123***	-0.195***	-0.201***
	(0.011)	(0.012)	(0.012)
Ed 9-11 yrs	-0.381***	-0.495***	-0.503***
	(0.023)	(0.024)	(0.024)
Ed 12-15 yrs	-0.208***	-0.395***	-0.406***
	(0.027)	(0.028)	(0.028)
Ed 16+ yrs	-0.080**	-0.309***	-0.319***
	(0.031)	(0.032)	(0.032)

Trend Results

	Trend Term Coefficient Estimates		
	Texas	Non-Texas	Nonborder
Males	0.009***	0.006***	0.006*
	(0.001)	(0.001)	(0.001)
Females	0.013***	0.013***	0.013***
	(0.003)	(0.001)	(0.001)

Conclusions

- U.S. and Mexican labor markets are closely integrated: A true “North American Market”
- Texas is more integrated with Mexico than other U.S. states
- Rising trade, investment, and migration does not seem to affect the wage gap between the two countries.
- Wage gap between Mexico and Texas (and the United States) is remarkably stable.