Online Appendix

The Impact of NAFTA on U.S. Local Labor Market Employment

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A. Appendix

A.A. Sample Selection and Local Labor Market Outcomes

The sample selection follows Autor et al. [2013]. I restrict the sample to individuals aged 16 to 64. Unpaid family workers and those living in institutional group quarters are excluded. Labor supply weights are constructed multiplying usual hours worked times weeks worked in the year preceding each survey. All employment outcomes are constructed weighing by these labor supply weights and by the Census person sampling weight.

A.B. Mexico's NAFTA Tariff Schedule

I digitize and process the schedule of Mexico's NAFTA tariffs toward the U.S. These data are obtained from Mexico's *Diario Oficial* (the official publication of Mexico's government). Products, listed at the 8-digit level of Mexico's version of the Harmonized System, are classified into several different categories according to the timeline of liberalization. The main categories are the following. Tariffs on category A products are eliminated immediately and entirely on January 1st, 1994. Category B products are liberalized in five equal steps starting January 1st, 1994, and become duty free on January 1st, 1998. Tariffs on category B6 products (a subset of textile and apparel products) are eliminated first by a percentage equal to the base rate on January 1st, 1994 and then in five equal steps, becoming duty free by January 1st, 1999. Tariffs on category C products are liberalized in ten equal steps starting January 1st, 1994, and become duty free on January 1st, 2003. Tariffs on category C+ products are liberalized in fifteen equal steps starting January 1st, 1994, and become duty free on January 1st, 2008. Category D products are duty free before NAFTA and remain as such. These categories account for more than 98% HS 8-digit products. The rest follows various exceptions which I process on a case by case basis.

Table A.1 reports the number of HS8 products under each category. Consistent with the pattern shown in Appendix Table A.6, most products are liberalized entirely or substantially shortly after January 1st, 1994.

Table A.1: Tariff Liberalization Categories: Mexico's Schedule

Category	Number of Products	% of Products
A	5815	47.4%
B	1747	14.2%
B+	3	0.0%
B6	762	6.2%
C	3436	28%
C+	3	0.0%
D	277	2.3%
Other	220	1.8%

Notes: This table reports the number of HS 8-digit products under each category of tariff liberalization in Mexico's tariff schedule.

A.C. U.S. NAFTA Tariff Schedule

Table A.2 describes the number of products under each category of U.S. tariff liberalization toward Mexico. While the tariff data in the analysis is obtained from Romalis [2007], here I use data from Besedes et al. [2020] to tabulate the liberalization categories.

The details are as follows. Tariffs on category A products are eliminated immediately and entirely on January 1st, 1994. Category B products are liberalized in five equal steps starting January 1st, 1994, and become duty free on January 1st, 1998. Tariffs on category B6 products (a subset of textile and apparel products) are eliminated first by a percentage equal to the base rate on January 1st, 1994 and then in five equal steps, becoming duty free by January 1st, 1999. Tariffs on category C products are liberalized in ten equal steps starting January 1st, 1994, and become duty free on January 1st, 2003. Tariffs on category C+ products are liberalized in fifteen equal steps starting January 1st, 1994, and become duty free on January 1st, 2008. Category D products are duty free before NAFTA and remain as such. Tariffs on category C10 fall to 80% of the original rate in January 1st, 1994 then to 70% in January 1st, 1996, and then in seven equal steps becoming duty free on January 1st, 2003. The rest of the products are labeled by Besedes et al. [2020] as mixed category products, such that within each HS8 product there are several subproducts indexed by letters (not by HS10 codes) that fall under different liberalization categories.

Overall, this table shows that at least 66.3% of HS8 products were duty free on January 1st 1994, at least 76.5% were duty free before January 1st, 1999, 10% were duty free beyond 2000 (but their tariff

rates in most cases had fallen by two thirds by 2000) and 13.45% were under the mixed category situation which means I don't have the data to determine which fraction was duty free before 2000.

Table A.2: Tariff Liberalization Categories: U.S. Schedule

Category	Number of Products	% of Products
A	4526	50.7%
B	179	2.0%
B6	728	8.2%
C	752	8.4%
C+	74	0.8%
C10	71	0.8%
D	1402	15.7%
Other	1202	13.45%

Notes: This table reports the number of HS 8-digit products under each category of tariff liberalization in the U.S. tariff schedule. Source: Besedes et al. [2020].

A.D. Instrument for Routine Employment Share

Here I describe the instrument for the commuting zone share of employment in routine occupations in 1990, introduced by Autor et al. [2015] and used in columns 1 and 3 through 6 in Table 8. This instrument is a measure of commuting zone historical industry structure defined as a weighted average of industries' share of employment in routine occupations in 1950, with weights equal to employment shares. Define $E_{i,j,1950}$ as the employment share of industry j in region i in 1950 and $R_{-i,j,1950}$ as the share of employment in routine occupations in industry i in all U.S. states except the state that includes region i. Then this instrument is:

$$\widetilde{RSH_i} = \sum_j E_{i,j,1950} \times R_{-i,j,1950} \,. \tag{6}$$

A.E. Alternative Measure of Regional Exposure to Tariff Liberalization

In this section I describe alternative measures of regional exposure to tariff liberalization and discuss the results obtained using these alternative measures.

■ Hakobyan and McLaren [2016] construct a measure of exposure to tariff liberalization that takes this into account Mexico's revealed comparative advantage. They measure Mexico's revealed comparative advantage in each industry j following Balassa [1965] and use it as an additional weight for industry-level tariffs:

$$\text{RCA}_j^{\text{MEX}} = \frac{x_{j\,1990}^{\text{MEX}} \Big/ x_{j\,1990}^{\text{ROW}}}{\sum_k x_{k\,1990}^{\text{MEX}} \Big/ \sum_k x_{k\,1990}^{\text{ROW}}} \ . \tag{7}$$

In this expression, $x_{j\,1990}^{\text{MEX}}$ stands for exports from Mexico to the rest of the world (i.e. all countries excluding Mexico and the U.S.) in industry j in 1990. $x_{j\,1990}^{\text{ROW}}$ stands for exports between all countries excluding the U.S. and Mexico. This measure of revealed comparative advantage captures Mexico's share of rest of the world trade in industry j relative to all industries. An alternative measure of regional exposure to U.S. tariff liberalization weighing by revealed comparative advantage is then the following:

$$\Delta\tau_i^{U.S.} = \frac{L_i^J}{L_i} \sum_{j\,\epsilon\,J} \frac{L_{ij}\text{RCA}_j^{\text{MEX}}\Delta\tau_j^{\text{U.S.}}}{L_{ij}\text{RCA}_j^{\text{MEX}}} \ . \tag{8}$$

In this expression, the denominator in the term $\sum_{j\,\epsilon\,J} \frac{L_{ij}\text{RCA}_j^{\text{MEX}}\Delta\tau_j^{\text{U.S.}}}{L_{ij}\text{RCA}_j^{\text{MEX}}}$ corresponds to the sum of employment across manufacturing industries weighed by Mexico's revealed comparative advantage. To be consistent with the baseline tariff measure defined by equation (1) in the main text, I multiply this term by the ratio of total regional employment in manufacturing industries over total regional employment $\frac{L_i^J}{L_i}$.

An equivalent measure of regional exposure to Mexico's tariff cuts accounting for U.S. revealed comparative advantage is the following.[83]

$$\Delta\tau_i^{MEX} = \frac{L_i^J}{L_i} \sum_{j\,\epsilon J} \frac{L_{ij}\text{RCA}_j^{\text{US}}\Delta\tau_j^{\text{MEX}}}{L_{ij}\text{RCA}_j^{\text{US}}} \ . \tag{9}$$

[83] Just as before, the assumption behind this measure is that Mexico's tariff cuts toward the U.S. should have a larger effect on U.S. exports in industries in which the U.S. has comparative advantage.

In this expression, U.S. revealed comparative advantage is defined as:

$$\text{RCA}_j^{\text{US}} = \frac{x_{j\,1990}^{\text{US}} \Big/ x_{j\,1990}^{\text{ROW}}}{\sum_k x_{k\,1990}^{\text{US}} \Big/ \sum_k x_{k\,1990}^{\text{ROW}}} \,, \tag{10}$$

where $x_{j\,1990}^{\text{US}}$ stands for exports from the U.S. to the rest of the world (i.e. all countries excluding Mexico and the U.S.) in industry j in 1990. Note that Appendix A.F describes the data used to construct the measures of revealed comparative advantage.

The tariff exposure measures in equations (8) and (9) are highly correlated with the baseline tariff measures in equations (1) and (2) in the main text (with correlation coefficients 0.93 for U.S. tariffs and 0.99 for Mexico's tariffs).

■ An alternative measure of exposure to U.S. tariff liberalization does not normalize by the ratio of total regional employment in manufacturing industries over total regional employment $\frac{L_i^J}{L_i}$ This is the exact same measure used by Hakobyan and McLaren [2016]:

$$\Delta\tau_i^{US} = \frac{\sum_{j\,\epsilon\,J} L_{ij} \text{RCA}_j^{\text{MEX}} \Delta\tau_j^{\text{US}}}{\sum_{j\,\epsilon\,J} \text{RCA}_j^{\text{MEX}} L_i} \,. \tag{11}$$

The following equation shows the equivalent to (11) but for exposure to Mexico's tariff liberalization, in which tariffs are weighted by U.S. revealed comparative advantage:

$$\Delta\tau_i^{MEX} = \frac{\sum_{j\,\epsilon\,J} L_{ij} \text{RCA}_j^{\text{US}} \Delta\tau_j^{\text{MEX}}}{\sum_{j\,\epsilon\,J} L_{ij} \text{RCA}_j^{\text{US}}} \,. \tag{12}$$

Again, these tariff exposure measures in equations (11) and (12) are highly correlated with the baseline tariff measures in equations (1) and (2) in the main text (with correlation coefficients 0.78 for U.S. tariffs and 0.59 for Mexico's tariffs).

Finally, while the baseline tariff exposure measures defined in the main text (in equations (1) and (2)) consider tariff changes for manufacturing industries, I also consider an equivalent measure including nonmanufacturing tradable industries. Note that there are 397 SIC 4-digit manufacturing industries and 419 SIC 4-digit tradable industries. Again, these tariff exposure measures are highly correlated with the baseline tariff measures in equations (1) and (2) in the main text (with correlation coefficients 0.99 for U.S. tariffs and also 0.99 for Mexico's tariffs).

Results Appendix Table A.14 shows that key results in the paper are robust to using these alternative measures of regional exposure to tariff liberalization.

Panel A replicates Table 4 in the main text using the exposure measures in equations (8) and (9). Panel B uses the exposure measures in equations (11) and (12). Finally, panel C uses the baseline measures in equations (1) and (2) but considering tariff changes in all tradable industries instead of only manufacturing industries.

The 0.907 coefficient on U.S. tariffs in column 2 in Table 4 implies a 0.20 percentage point decline in manufacturing employment as a share of the working-age population in regions at the 75th percentile of exposure relative to regions at the 25th percentile. The equivalent in panels A, B and C of Appendix Table A.14 is statistically significant in all cases and implies 0.16, 0.14 and 0.18 percentage point declines respectively.

For nonmanufacturing employment, the coefficient on U.S. tariffs in column 4 of Table 4 is statistically significant.[84] It is also statistically significant in panels B and C in A.14, and it has the same sign but is not statistically significant in panel A. In panel B, or example, the coefficient implies a 0.09 percentage point increase in nonmanufacturing employment as a share of the working-age population in regions at the 75th percentile of exposure relative to regions at the 25th percentile, which is the same magnitude implied by Table 4.

The 0.458 coefficient in column 6 in Table 4 implies a 0.1 percentage point decline in total employment as a share of the working-age population in regions at the 75th percentile of exposure relative to regions at the 25th percentile. The equivalent in panel A of Appendix Table A.14 is also a 0.10 percentage point decline. The coefficient in panels B and C have the same sign but are not statistically significant.

The results for the effect of U.S. tariff cuts on unemployment and labor force nonparticipation are also quite similar with the alternative tariff measures.

Finally, in all panels in Table A.14 exposure to Mexican tariff cuts does not have a statistically significant impact on most outcomes, except for a small decline in unemployment.

A.F. Construction of Revealed Comparative Advantage

The measures of revealed comparative advantage defined by equations (7) and (10) require industry-level trade flows in 1990. Specifically, I use exports from Mexico to the rest of the world excluding the U.S.,

[84] Recall that this result in Table 4 was also not statistically significant under exposure–robust standard errors.

exports from the U.S. to the rest of the world excluding Mexico, and exports among the rest of the world excluding the U.S. and Mexico. I use a concordance provided by Autor et al. [2013] to assign trade flows from the 1988/1992 version of the Harmonized System ("H0") to SIC industries. The trade data are obtained from the UN's Comtrade database through the World Bank's World Integrated Trade Solution (WITS). They are downloaded using the SITC revision 2 classification, given that in 1990 only some countries report trade using the Harmonized System. I then use a concordance between SITC Tier 4 codes and the 1988/1992 HS Classification 6-digit codes.

A.G. Did NAFTA Increase Trade Flows?

This section shows that both U.S. and Mexico's tariff liberalization under NAFTA led to increased trade. To assess the effect of U.S. tariff liberalization, I use data on U.S. imports by HS 6-digit product and source country in 1990 and 2000.[85] I estimate the following difference in differences regression with country-year, product-country and product-year fixed effects:

$$\log(\text{Value})_{pct} = \gamma_{pc} + \nu_{pt} + \eta_{ct} + \beta \cdot \text{Mexico}_c \cdot \text{High Tariff}_p \cdot \text{Post}_t + \epsilon_{pct} \,. \tag{13}$$

The effect of U.S. tariff liberalization is captured by the triple interaction between a dummy variable High Tariff_p equal to one for products with above-median tariffs in 1990 and zero otherwise, a dummy Mexico_c equal to one for imports sourced from Mexico and zero otherwise, and a dummy Post_t equal to one for year 2000 and zero for 1990. The results are shown in column 1 in Table A.3 and the 0.286 coefficient implies a 33% increase between 1990 and 2000 in U.S. imports from Mexico relative to imports from the rest of the world in industries with high initial tariff levels relative to other industries.

Similarly, I estimate an equivalent regression using data on U.S. exports to Mexico and all other countries. In this case the High Tariff_p dummy variable is equal to one for products with above-median Mexican tariffs in 1990 and zero otherwise, and Mexico_c is equal to one for exports to Mexico. The coefficient in column 2 in Table A.3 implies a 24% increase between 1990 and 2000 in U.S. exports to Mexico relative to exports to the rest of the world in industries with high initial tariff levels relative to other industries.

Table A.3: NAFTA Tariff Liberalization and Trade Flows

Dependent Variable: (log) U.S. imports from Mexico or U.S. exports to Mexico

	U.S. Imports (1)	U.S. Exports (2)
$1[\text{Mexico}_c] \cdot 1[\text{High Tariff}_p] \cdot 1[\text{Post}_t]$	0.286*	0.216*
	(0.038)	(0.028)
N	137352	277878

Notes: This table reports the results of the estimation of equation (13). Column 1 corresponds to U.S. imports and column 2 corresponds to U.S. exports. Standard errors are clustered by HS 6-digit product, year and origin (or destination) using multiway clustering. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

[85] These data on U.S. imports and exports are produced by the U.S. Census Bureau and obtained from Schott [2008].

A.H. Descriptive Statistics

Table A.4: Summary Statistics for Local Labor Market Outcomes

Percentage of working-age population employed in manufacturing	1990	2000	1990-2000
All	12.7	10.5	-2.1
	(4.8)	(4.5)	(1.6)
Noncollege	13.4	11.0	-2.3
	(5.4)	(5.1)	(1.9)
College	11.6	9.9	-1.7
	(4.2)	(4.0)	(1.6)
Female	8.3	6.7	-1.5
	(3.7)	(3.0)	(1.6)
Male	17.3	14.5	-2.6
	(6.4)	(6.1)	(2.0)
Nonwhite	13.3	11.2	-2.0
	(6.2)	(5.6)	(3.1)
White	13.9	11.6	-2.1
	(5.2)	(4.9)	(1.7)

Percentage of working-age population employed in nonmanufacturing	1990	2000	1990-2000
All	57.8	59.2	1.3
	(5.9)	(5.2)	(2.4)
Noncollege	48.9	49.1	0.0
	(5.8)	(5.3)	(2.7)
College	67.9	68.5	0.5
	(4.5)	(4.0)	(2.0)
Female	55.4	57.7	2.3
	(5.9)	(5.4)	(2.8)
Male	60.2	60.7	0.2
	(6.8)	(6.1)	(2.6)
Nonwhite	47.9	49.9	1.8
	(8.2)	(6.5)	(4.1)
White	58.6	60.7	2.0
	(6.2)	(5.5)	(2.2)

Percentage of working-age population employed	1990	2000	1990-2000
All	70.4	69.7	-0.8
	(5.0)	(5.0)	(2.8)
Noncollege	62.3	60.1	-2.2
	(5.4)	(5.9)	(3.3)
College	79.5	78.4	-1.1
	(3.9)	(3.6)	(2.4)
Female	63.6	64.3	0.8
	(5.5)	(5.5)	(3.2)
Male	77.5	75.2	-2.4
	(4.9)	(4.9)	(2.8)
Nonwhite	61.1	61.1	-0.2
	(6.7)	(4.6)	(4.8)
White	72.4	72.3	-0.1
	(4.8)	(4.7)	(2.5)

Percentage of working-age population unemployed	1990	2000	1990-2000
All	4.8	4.3	-0.5
	(1.0)	(0.9)	(0.7)
Noncollege	6.3	5.7	-0.6
	(1.2)	(1.2)	(0.9)
College	3.1	3.0	-0.2
	(0.7)	(0.7)	(0.7)
Female	4.2	4.0	-0.3
	(0.9)	(0.9)	(0.7)
Male	5.4	4.6	-0.8
	(1.3)	(1.1)	(0.9)
Nonwhite	8.4	6.9	-1.4
	(2.2)	(1.6)	(1.8)
White	4.0	3.5	-0.5
	(0.9)	(0.8)	(0.7)

Percentage of working-age population not in the labor force	1990	2000	1990-2000
All	24.8	26.1	1.3
	(4.3)	(4.4)	(2.6)
Noncollege	31.4	34.2	2.8
	(4.6)	(5.2)	(3.0)
College	17.4	18.7	1.3
	(3.6)	(3.3)	(2.2)
Female	32.1	31.7	-0.5
	(4.9)	(4.9)	(3.0)
Male	17.1	20.2	3.2
	(4.5)	(4.3)	(2.6)
Nonwhite	30.5	31.9	1.6
	(5.6)	(3.9)	(4.4)
White	23.6	24.2	0.6
	(4.3)	(4.2)	(2.2)

Percentage of working-age population employed in nonmanufacturing industries	1990	2000	1990-2000
Construction	4.4	4.8	0.3
	(0.9)	(1.0)	(0.8)
Transportation and Utilities	5.1	5.1	-0.0
	(1.1)	(1.1)	(0.5)
Wholesale and retail trade	14.9	14.2	-0.7
	(1.6)	(1.5)	(0.9)
Other services	27.7	30.0	2.3
	(4.3)	(4.3)	(1.4)
Government	3.3	3.3	-0.0
	(1.8)	(1.4)	(0.6)

Notes: This table reports the mean and standard deviation (in parenthesis under the mean) for local labor market outcomes studied throughout the paper. These statistics are weighted by 1990 population in each commuting zone.

Table A.4: Summary Statistics for Local Labor Market Outcomes (*Continued*)

Percentage of working-age population employed in abstract occupations	1990	2000	1990-2000
All	25.0	26.0	0.9
	(4.8)	(4.9)	(1.3)
Noncollege	8.9	7.7	-1.3
	(1.4)	(1.1)	(0.7)
College	42.8	42.2	-0.6
	(4.9)	(4.8)	(1.6)

Percentage of working-age population employed in routine (clerical and sales) occupations	1990	2000	1990-2000
All	16.7	16.4	-0.3
	(2.3)	(1.8)	(1.2)
Noncollege	15.2	14.8	-0.4
	(2.9)	(2.4)	(1.4)
College	18.5	18.0	-0.6
	(1.8)	(1.4)	(1.2)

Percentage of working-age population employed in routine (production) occupations	1990	2000	1990-2000
All	7.3	6.1	-1.1
	(2.9)	(2.7)	(1.0)
Noncollege	9.8	8.5	-1.3
	(3.6)	(3.4)	(1.3)
College	4.3	3.9	-0.4
	(1.7)	(1.8)	(0.7)

Percentage of working-age population employed in manual occupations	1990	2000	1990-2000
All	21.4	21.2	-0.2
	(3.2)	(3.1)	(1.0)
Noncollege	28.3	29.1	0.7
	(3.1)	(3.0)	(1.6)
College	13.9	14.3	0.4
	(2.9)	(3.0)	(1.0)

Notes: This table reports the mean and standard deviation (in parenthesis under the mean) for local labor market outcomes studied throughout the paper. These statistics are weighted by 1990 population in each commuting zone.

Table A.5: Summary Statistics for Measures of Regional Exposure to Tariff Liberalization

	Defined by equation	Mean	St. Dev.	p10	p25	p50	p75	p90
Panel A: Across all commuting zones								
$\Delta\tau^{US}$	1	-0.45	0.53	-0.90	-0.41	-0.30	-0.20	-0.13
$\Delta\tau^{US}$	8	-0.44	0.56	-0.87	-0.44	-0.24	-0.18	-0.12
$\Delta\tau^{US}$	11	-1.91	1.43	-3.69	-1.99	-1.56	-1.12	-0.81
$\Delta\tau^{MEX}$	2	-2.50	1.24	-3.98	-2.91	-2.34	-1.57	-1.32
$\Delta\tau^{MEX}$	9	-2.32	1.18	-3.85	-2.77	-2.23	-1.51	-1.16
$\Delta\tau^{MEX}$	12	-11.55	1.56	-12.68	-11.96	-11.55	-10.91	-9.97
Panel B: By human capital								
$\Delta\tau^{US}$ (low human capital)	1	-1.00	0.87	-2.07	-1.26	-0.72	-0.41	-0.21
$\Delta\tau^{US}$ (high human capital)	1	-0.29	0.20	-0.43	-0.36	-0.24	-0.17	-0.12
$\Delta\tau^{MEX}$ (low human capital)	2	-3.70	1.70	-5.73	-4.75	-3.50	-2.51	-1.81
$\Delta\tau^{MEX}$ (high human capital)	2	-2.16	0.80	-3.10	-2.69	-2.12	-1.47	-1.32

Notes: This table reports summary statistics of the distribution of the measures of exposure to NAFTA tariff liberalization between 1990 and 2000. High (low) human capital commuting zones are those with an above (below) share of working-age population with college education in 1990. These statistics are weighted by 1990 population in each commuting zone.

Table A.6: Regional Exposure to Tariff Liberalization Over Time

Year	Mean	St. Dev.	p10	p25	p50	p75	p90
Panel A: Regional Exposure to U.S. Tariffs (equation (14))							
1993	0.35	0.47	0.09	0.14	0.20	0.33	0.75
1994	0.21	0.30	0.04	0.08	0.12	0.20	0.44
1997	0.11	0.15	0.02	0.03	0.06	0.10	0.24
2000	0.03	0.04	0.00	0.01	0.02	0.02	0.06
Panel B: Regional Exposure to Mexico's Tariffs (equation (15))							
1993	2.76	1.37	1.48	1.77	2.55	3.27	4.48
1994	1.27	0.69	0.61	0.77	1.13	1.53	2.24
1997	0.71	0.42	0.34	0.42	0.64	0.84	1.29
2000	0.27	0.15	0.13	0.16	0.24	0.32	0.47

Notes: Panel A tabulates the mean, standard deviation, and 10th, 25th, 50th, 75th and 90th percentiles of the distribution across commuting zones of the following measure of regional exposure to U.S. tariff liberalization, in which employment is computed in 1990 and tariffs vary by year. L_{ij} stands for employment in commuting zone i in industry j. $\tau_{tj}^{U.S.}$ is the U.S.' tariff toward Mexico in industry j in year t.

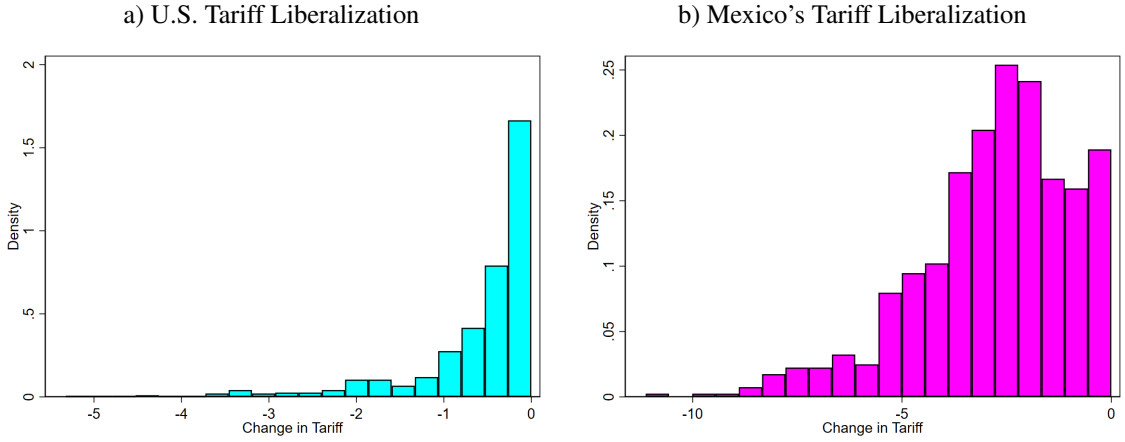
$$\tau_{it}^{U.S.} = \sum_j \frac{L_{ij}\tau_{tj}^{\text{U.S.}}}{L_{ij}} \ . \tag{14}$$

Panels B tabulates equivalent summary statistics of the distribution across commuting zones of the following measure of regional exposure to Mexico's tariff liberalization. τ_{tj}^{MEX} is Mexico's tariff toward the U.S. in industry j in year t.

$$\tau_{it}^{MEX} = \sum_j \frac{L_{ij}\tau_{tj}^{\text{MEX}}}{L_{ij}} \ . \tag{15}$$

These summary statistics are weighted by commuting zone population in 1990.

Figure A.1: Distribution of Changes in Regional Exposure to Tariff Liberalization



Notes: These histograms show the distribution of the measures of regional exposure to tariff liberalization. Figure a) corresponds to exposure to U.S. tariff liberalization, defined by equation (1). Figure b) corresponds to exposure to Mexico's tariff liberalization, defined by equation (2).

Table A.7: Largest and Smallest Exposure to Tariff Liberalization Among 100 Largest Commuting Zones

Panel A: U.S. Tariffs

Rank	CZ Name	State	Change in Tariff	Rank	CZ Name	State	Change in Tariff
1	Fayetteville	NC	-2.770	91	Denver	CO	-0.137
2	Greenville	SC	-2.060	92	Des Moines	IA	-0.136
3	Greensboro	NC	-2.055	93	Jacksonville	FL	-0.127
4	Charlotte	NC	-1.289	94	Houston	TX	-0.121
5	El Paso	TX	-1.256	95	New Orleans	LA	-0.116
6	Johnson City	TN	-1.141	96	Orlando	FL	-0.109
7	Allentown	PA	-1.030	97	Tucson	AZ	-0.089
8	Reading	PA	-0.997	98	Port St. Lucie	FL	-0.086
9	Scranton	PA	-0.981	99	Las Vegas	NV	-0.036
10	Brownsville	TX	-0.975	100	Washington DC	MD	-0.033

Panel B: Mexico's Tariffs

Rank	CZ Name	State	Change in Tariff	Rank	CZ Name	State	Change in Tariff
1	Greensboro	NC	-5.594	91	Tucson	AZ	-1.273
2	Fayetteville	NC	-5.343	92	Orlando	FL	-1.270
3	Johnson City	TN	-4.972	93	San Antonio	TX	-1.260
4	Reading	PA	-4.797	94	Toms River	NJ	-1.210
5	Grand Rapids	MI	-4.567	95	Jacksonville	FL	-1.150
6	Rockford	IL	-4.493	96	New Orleans	LA	-1.108
7	Greenville	SC	-4.438	97	Port St. Lucie	FL	-0.930
8	Kenosha	WI	-4.168	98	Bakersfield	CA	-0.910
9	Canton	OH	-3.978	99	Washington DC	MD	-0.523
10	Erie	PA	-3.893	100	Las Vegas	NV	-0.459

Notes: This table reports the list of commuting zones facing the largest and smallest reductions in regional tariff exposure among the largest 100 commuting zones in terms of 1990 population. Panel A corresponds to exposure to U.S. tariff liberalization (defined by equation (1)). Panel B corresponds to exposure to Mexico's tariff liberalization (defined by equation (2)). States listed correspond to the state in which a commuting zone has the largest share of population. Commuting zone names are obtained from Chetty et al. [2014].

Table A.8: Employment by Gender and Race Across Manufacturing Sectors

Rank	Sector Name	Number of Workers (thousands)	Share Female	Share Nonwhite	Change in Tariff
Panel A: Sectors ranked by change in U.S. tariffs					
1	Apparel And Other Textile Products	1360	0.78	0.32	-12.48
2	Textile Mill Products	927	0.52	0.26	-11.94
3	Leather And Leather Products	158	0.64	0.16	-7.39
4	Food And Kindred Products	1745	0.38	0.25	-3.69
5	Chemicals And Allied Products	1367	0.33	0.17	-1.45
6	Tobacco Products	63	0.36	0.30	-1.37
7	Industrial Machinery And Equip., Electronic And Electric Equip.	4460	0.32	0.15	-1.31
8	Transportation Equipment	2899	0.23	0.17	-1.22
9	Stone, Clay, And Glass Products	639	0.26	0.16	-1.21
10	Primary Metal Industries And Fabricated Metal Products	2262	0.21	0.16	-0.97
11	Rubber And Misc. Plastics Products	797	0.37	0.18	-0.90
12	Miscellaneous Manufacturing Industries	1523	0.43	0.25	-0.58
13	Instruments And Related Products	577	0.46	0.15	-0.34
14	Petroleum And Coal Products	214	0.21	0.16	-0.32
15	Paper And Allied Products	733	0.27	0.16	-0.25
16	Furniture And Fixtures	679	0.33	0.20	-0.24
17	Lumber And Wood Products	840	0.17	0.17	-0.17
18	Printing And Publishing	2228	0.47	0.13	0.00
Panel B: Sectors ranked by change in Mexico's tariffs					
1	Tobacco Products	63	0.36	0.30	-35.00
2	Apparel And Other Textile Products	1360	0.78	0.32	-19.06
3	Miscellaneous Manufacturing Industries	1523	0.43	0.25	-15.96
4	Stone, Clay, And Glass Products	639	0.26	0.16	-15.38
5	Textile Mill Products	927	0.52	0.26	-14.92
6	Lumber And Wood Products	840	0.17	0.17	-14.80
7	Furniture And Fixtures	679	0.33	0.20	-14.72
8	Leather And Leather Products	158	0.64	0.16	-14.09
9	Food And Kindred Products	1745	0.38	0.25	-13.63
10	Rubber And Misc. Plastics Products	797	0.37	0.18	-13.36
11	Industrial Machinery And Equip., Electronic And Electric Equip.	4460	0.32	0.15	-13.05
12	Instruments And Related Products	577	0.46	0.15	-12.34
13	Transportation Equipment	2899	0.23	0.17	-12.09
14	Primary Metal Industries And Fabricated Metal Products	2262	0.21	0.16	-11.91
15	Chemicals And Allied Products	1367	0.33	0.17	-10.94
16	Petroleum And Coal Products	214	0.21	0.16	-8.24
17	Paper And Allied Products	733	0.27	0.16	-8.03
18	Printing And Publishing	2228	0.47	0.13	-6.44

Notes: Panel A lists the 18 SIC 2-digit manufacturing industries sorted based on the size of the reductions in U.S. tariffs toward Mexico between 1990 and 2000. Panel B sorts these sectors according to the reductions in Mexico's tariffs toward the U.S. between 1990 and 2000. To construct this table, I use Autor et al. [2013] concordance between the industries in the 1990 Census and their modified SIC-87 classification. For that reason, I group together the 2-digit industries "Industrial Machinery And Equip.," and "Electronic And Electric Equip." as well as the 2-digit industries "Primary Metal Industries" and "Fabricated Metal Products".

Table A.9: Summary Statistics for Growth in Chinese Import Competition

	Defined by equation	Mean	St. Dev.	p10	p25	p50	p75	p90
ΔIPW$_{ui}$	3	1.04	0.91	0.36	0.57	0.82	1.18	1.88
ΔIPW$_{oi}$	4	1.02	0.70	0.35	0.54	0.92	1.28	1.88

Notes: This table reports summary statistics of the distribution of the measure of growth in Chinese imports between 1990 and 2000, ΔIPW$_{ui}$ and the instrument used for it, growth in Chinese imports by other eight developed countries ΔIPW$_{oi}$. These statistics are weighted by 1990 population in each commuting zone.

Table A.10: Summary Statistics for Initial Routine Employment Share

	Mean	St. Dev.	p10	p25	p50	p75	p90
Share of 1990 Empl. in Routine Occs.	32.23	2.83	28.13	30.44	32.85	34.45	35.01
$\widetilde{RSH_i}$	24.11	4.76	17.28	21.47	25.04	26.96	28.19

Notes: The first row reports summary statistics for the distribution of the share of employment in routine occupations in 1990. The second row reports summary statistics for the instrument used for the initial routine employment share, which is defined by equation (6). These statistics are weighted by 1990 population in each commuting zone.

A.I. Additional Results

Table A.11: NAFTA Tariff Liberalization and Change in Share of Manufacturing Employment in the Working-Age Population: 2SLS First Stage Estimates

Dependent Variable: Change in Chinese import exposure per worker, ΔIPW_{ui}	
	(1)
ΔIPW$_{oi}$	0.709***
	(0.158)

Notes: $N = 722$. This table reports the results of the first stage for the 2SLS estimation of equation (5). The measures of exposure to tariff liberalization are defined by equations (1) and (2). Standard errors are clustered by state and observations are weighted by 1990 population in each commuting zone. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

Table A.12: Growth in Chinese Imports and Change in Employment Status in the Working-Age Population

Dependent Variable: Change in population shares by employment status (in % pts)

		By Education		By Gender		By Age		
	All	Noncollege	College	Female	Male	16-34	35-49	50-64
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Manufacturing								
ΔIPW	-0.222	-0.263	-0.006	-0.627***	0.206	-0.197	-0.295*	-0.141
	(0.169)	(0.167)	(0.220)	(0.156)	(0.259)	(0.227)	(0.173)	(0.170)
Panel B: Nonmanufacturing								
ΔIPW	0.195	0.144	0.199	0.130	0.237	0.290	0.119	0.048
	(0.202)	(0.232)	(0.185)	(0.186)	(0.259)	(0.242)	(0.197)	(0.294)
Panel C: Employment								
ΔIPW	-0.028	-0.119	0.193	-0.498***	0.443	0.093	-0.176	-0.093
	(0.211)	(0.269)	(0.158)	(0.193)	(0.310)	(0.254)	(0.212)	(0.254)
Panel D: Unemployment								
ΔIPW	-0.052	-0.087	-0.006	-0.060	-0.041	-0.061	-0.043	-0.050
	(0.088)	(0.112)	(0.064)	(0.070)	(0.122)	(0.123)	(0.082)	(0.051)
Panel E: Not in the labor force								
ΔIPW	0.080	0.206	-0.187	0.557***	-0.402*	-0.032	0.218	0.143
	(0.157)	(0.196)	(0.148)	(0.177)	(0.242)	(0.190)	(0.152)	(0.236)

Notes: $N = 722$. This table reports the results of the estimation of equation (5). The dependent variables are the change in the share in the working-age population of manufacturing employment (panel A), of nonmanufacturing employment (panel B), of total employment (panel C), of unemployment (panel D) and of the number of individuals not in the labor force (panel E) overall (column 1) or for the subgroups listed in each column between 2 and 8. All regressions are estimated by 2SLS, and growth in Chinese imports (ΔIPW_{ui}, defined by equation (3)) is instrumented by growth in Chinese exports to non-U.S. high-income markets (defined by equation (4)). Each column includes all control variables used in Table 1. Standard errors are clustered by state and observations are weighted by 1990 population in each commuting zone. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

Table A.13: NAFTA Tariff Liberalization and Change in Share of Manufacturing Employment in the Working-Age Population: Control Variables Introduced Sequentially

Dependent Variable: Change in manufacturing emp/working-age pop (in % pts)

	(1)	(2)	(3)	(4)	(5)
$\Delta\tau^{\text{US}}$	1.417***	1.357***	1.578***	1.667***	0.907***
	(0.404)	(0.376)	(0.333)	(0.342)	(0.305)
$\Delta\tau^{\text{MEX}}$	-0.474**	-0.207	-0.307	-0.565**	-0.325
	(0.225)	(0.307)	(0.269)	(0.265)	(0.218)
ΔIPW	-0.900***	-0.890***	-0.441*	-0.567**	-0.216
	(0.320)	(0.322)	(0.250)	(0.252)	(0.198)
Percentage of employment in manufacturing$_{1990}$		3.528	-3.062	-4.682	-6.939**
		(3.465)	(3.409)	(3.509)	(3.329)
Percentage of college-educated population$_{1990}$			-0.030	-0.018	-0.000
			(0.026)	(0.025)	(0.018)
Percentage of foreign-born population$_{1990}$			-0.055***	-0.029***	0.001
			(0.009)	(0.011)	(0.013)
Percentage of employment among women$_{1990}$			-0.044	0.000	0.022
			(0.029)	(0.032)	(0.026)
Percentage of employment in routine occupations$_{1990}$				-0.150***	-0.201***
				(0.052)	(0.057)
Average offshorability index of occupations$_{1990}$				-0.355	-0.641*
				(0.324)	(0.379)
Census division dummies	No	No	No	No	Yes

Notes: $N = 722$. This table reports the results of the estimation of equation (5). The dependent variable is the change in manufacturing employment as a share of the working-age population. The measures of exposure to tariff liberalization are defined by equations (1) and (2). All regressions are estimated by 2SLS, and growth in Chinese imports (ΔIPW_{ui}, defined by equation (3)) is instrumented by growth in Chinese exports to non-U.S. high-income markets (defined by equation (4)). Standard errors are clustered by state and observations are weighted by 1990 population in each commuting zone. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

Table A.14: NAFTA Tariff Liberalization and Change in Employment Status in the Working-Age Population: Alternative Measures of Regional Exposure to Tariff Liberalization

Dependent Variable: Change in population shares by employment status (in % pts)

	Manufacturing		Nonmanufacturing		Employment		Unemployment		Not in the Labor Force	
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Alternative measure of exposure weighing by revealed comparative advantage										
$\Delta\tau^{US}$	0.601**	0.628***	-0.201	-0.229	0.400**	0.399*	-0.160**	-0.149*	-0.240	-0.250
	(0.254)	(0.238)	(0.190)	(0.172)	(0.192)	(0.206)	(0.075)	(0.080)	(0.161)	(0.171)
$\Delta\tau^{MEX}$	0.131	0.066	-0.151	-0.085	-0.020	-0.019	0.148**	0.122*	-0.128	-0.103
	(0.224)	(0.213)	(0.243)	(0.247)	(0.197)	(0.183)	(0.063)	(0.069)	(0.179)	(0.166)
ΔIPW		-0.220		0.223		0.003		-0.088		0.086
		(0.191)		(0.234)		(0.227)		(0.095)		(0.168)
Panel B: Alternative treatment of nontradable sector in measure of regional exposure to tariff liberalization										
$\Delta\tau^{US}$	0.156*	0.161*	-0.096	-0.101*	0.060	0.060	-0.049*	-0.047*	-0.011	-0.013
	(0.087)	(0.083)	(0.063)	(0.057)	(0.080)	(0.081)	(0.024)	(0.025)	(0.070)	(0.071)
$\Delta\tau^{MEX}$	0.018	0.005	-0.037	-0.026	-0.020	-0.021	0.043***	0.038***	-0.023	-0.017
	(0.051)	(0.045)	(0.056)	(0.055)	(0.051)	(0.048)	(0.013)	(0.014)	(0.047)	(0.044)
ΔIPW		-0.224		0.209		-0.015		-0.087		0.103
		(0.194)		(0.237)		(0.222)		(0.096)		(0.164)
Panel C: Baseline tariff measure including tariffs in nonmanufacturing tradable industries										
$\Delta\tau^{US}$	0.785**	0.829***	-0.412	-0.470**	0.373	0.359	-0.267***	-0.245**	-0.106	-0.115
	(0.340)	(0.320)	(0.255)	(0.220)	(0.227)	(0.250)	(0.090)	(0.097)	(0.200)	(0.215)
$\Delta\tau^{MEX}$	0.021	-0.080	0.271	0.404	0.292	0.324	0.157**	0.105	-0.449*	-0.429*
	(0.235)	(0.204)	(0.295)	(0.278)	(0.273)	(0.232)	(0.077)	(0.074)	(0.248)	(0.231)
ΔIPW		-0.188		0.247		0.059		-0.097		0.038
		(0.194)		(0.242)		(0.212)		(0.094)		(0.159)

Notes: $N = 722$. This table reports the results of the estimation of equation (5). The dependent variables are the change in the share in the working-age population of manufacturing employment (columns 1-2), of nonmanufacturing employment (columns 3-4), of total employment (columns 5-6), of unemployment (columns 7-8) and of the number of individuals not in the labor force (columns 9-10). The measures of exposure to tariff liberalization weigh tariffs by revealed comparative advantage, as defined by equations (8) and (9) in panel A, by equations (11) and (12) in panel B, and by equations (1) and (2) (but computed over all tradable industries instead of manufacturing industries) in panel C. Columns 1, 3, 5, 7 and 9 are estimated by OLS. In columns 2, 4, 6, 8 and 10, estimated by 2SLS, growth in Chinese imports (ΔIPW_{ui}, defined by equation (3)) is instrumented by growth in Chinese exports to non-U.S. high-income markets (defined by equation (4)). Each column includes all control variables used in Table 1. Standard errors are clustered by state and observations are weighted by 1990 population in each commuting zone. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

Table A.15: NAFTA Tariff Liberalization and Change in Employment Status in the Working-Age Population: OLS Estimates

Dependent Variable: Change in population shares by employment status (in % pts)

	Manufacturing	Nonmanufacturing	Employment	Unemployment	Not in the Labor Force
	(1)	(2)	(3)	(4)	(5)
Panel A: All					
$\Delta\tau^{US}$	0.803**	-0.383	0.420*	-0.262***	-0.158
	(0.346)	(0.247)	(0.241)	(0.094)	(0.192)
$\Delta\tau^{MEX}$	-0.069	0.152	0.082	0.147*	-0.229
	(0.271)	(0.349)	(0.306)	(0.085)	(0.295)
Panel B: No college education					
$\Delta\tau^{US}$	1.111***	-0.208	0.902***	-0.405***	-0.497*
	(0.375)	(0.287)	(0.328)	(0.113)	(0.272)
$\Delta\tau^{MEX}$	0.097	-0.026	0.071	0.224**	-0.296
	(0.306)	(0.421)	(0.418)	(0.107)	(0.398)
Panel C: College education					
$\Delta\tau^{US}$	0.005	-0.164	-0.159	-0.073	0.232
	(0.351)	(0.308)	(0.237)	(0.096)	(0.238)
$\Delta\tau^{MEX}$	-0.547**	0.272	-0.275	0.037	0.238
	(0.266)	(0.284)	(0.255)	(0.103)	(0.246)
Panel D: Female					
$\Delta\tau^{US}$	1.564***	-0.609**	0.956***	-0.220***	-0.736***
	(0.274)	(0.236)	(0.239)	(0.076)	(0.198)
$\Delta\tau^{MEX}$	0.520**	-0.173	0.348	0.110	-0.458*
	(0.205)	(0.276)	(0.253)	(0.083)	(0.246)
Panel E: Male					
$\Delta\tau^{US}$	0.040	-0.126	-0.086	-0.298**	0.385*
	(0.436)	(0.322)	(0.280)	(0.131)	(0.229)
$\Delta\tau^{MEX}$	-0.716*	0.498	-0.218	0.184*	0.033
	(0.397)	(0.491)	(0.426)	(0.107)	(0.405)
Panel F: Nonwhite					
$\Delta\tau^{US}$	0.607	0.163	0.770	-0.603**	-0.167
	(0.453)	(0.461)	(0.466)	(0.237)	(0.443)
$\Delta\tau^{MEX}$	0.571	-0.708	-0.137	-0.341	0.478
	(0.452)	(0.735)	(0.643)	(0.339)	(0.644)
Panel G: White					
$\Delta\tau^{US}$	0.778**	-0.442*	0.337	-0.210**	-0.127
	(0.324)	(0.237)	(0.220)	(0.094)	(0.170)
$\Delta\tau^{MEX}$	-0.239	0.341	0.102	0.200**	-0.302
	(0.251)	(0.326)	(0.274)	(0.083)	(0.261)

Notes: $N = 722$. This table reports the results of the estimation of equation (5). The dependent variables are the change in the share in the working-age population of manufacturing employment (column 1), of nonmanufacturing employment (column 2), of total employment (column 3), of unemployment (column 4) and of the number of individuals not in the labor force (column 5). The measures of exposure to tariff liberalization are defined by equations (1) and (2). All columns are estimated by OLS. Each column includes all control variables used in Table 1. Standard errors are clustered by state and observations are weighted by 1990 population in each commuting zone. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

Table A.16: NAFTA Tariff Liberalization and Change in Employment Status in the Working-Age Population by Age

Dependent Variable: Change in population shares by employment status (in % pts)

	Manufacturing	Nonmanufacturing	Employment	Unemployment	Not in the Labor Force
	2SLS	2SLS	2SLS	2SLS	2SLS
	(1)	(2)	(3)	(4)	(5)
Panel A: Age 16-34					
$\Delta\tau^{US}$	0.739**	-0.863***	-0.125	-0.251	0.376
	(0.348)	(0.256)	(0.343)	(0.160)	(0.294)
$\Delta\tau^{MEX}$	-0.091	-0.062	-0.153	0.009	0.144
	(0.285)	(0.375)	(0.365)	(0.186)	(0.419)
ΔIPW	-0.172	0.201	0.030	-0.126	0.097
	(0.274)	(0.274)	(0.251)	(0.140)	(0.187)
Panel B: Age 35-49					
$\Delta\tau^{US}$	1.025**	-0.379	0.646***	-0.211**	-0.435***
	(0.420)	(0.315)	(0.214)	(0.097)	(0.160)
$\Delta\tau^{MEX}$	-0.826*	0.939**	0.113	0.168	-0.281
	(0.444)	(0.423)	(0.330)	(0.106)	(0.253)
ΔIPW	-0.380*	0.300	-0.080	-0.070	0.150
	(0.209)	(0.248)	(0.228)	(0.095)	(0.156)
Panel C: Age 50-64					
$\Delta\tau^{US}$	0.764**	0.533	1.296***	-0.193**	-1.104***
	(0.301)	(0.432)	(0.423)	(0.078)	(0.379)
$\Delta\tau^{MEX}$	-0.265	0.327	0.063	0.205**	-0.267
	(0.246)	(0.462)	(0.385)	(0.100)	(0.355)
ΔIPW	-0.134	0.243	0.110	-0.058	-0.052
	(0.195)	(0.349)	(0.271)	(0.058)	(0.252)

Notes: $N = 722$. This table reports the results of the estimation of equation (5). The dependent variables are the change in the share in the working-age population of manufacturing employment (column 1), of nonmanufacturing employment (column 2), of total employment (column 3), of unemployment (column 4) and of the number of individuals not in the labor force (column 5) by age-groups. The measures of exposure to tariff liberalization are defined by equations (1) and (2). All columns are estimated by 2SLS, and growth in Chinese imports (ΔIPW_{ui}, defined by equation (3)) is instrumented by growth in Chinese exports to non-U.S. high-income markets (defined by equation (4)). Each column includes all control variables used in Table 1. Standard errors are clustered by state and observations are weighted by 1990 population in each commuting zone. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

Table A.17: Growth in Chinese Imports and Change in Share of Task Employment in the Working-Age Population

Dependent Variable: Change in occupational emp/working-age pop (in % pts)

	Abstract	Routine: Clerical/Sales	Routine: Production	Manual
	(1)	(2)	(3)	(4)
ΔIPW	0.232	0.090	-0.069	0.029
	(0.191)	(0.120)	(0.118)	(0.100)
Share of 1990 Employment in Routine Occupations	0.229*	0.107	-0.056	0.304***
	(0.119)	(0.096)	(0.067)	(0.087)

Notes: $N = 722$. This table reports the results of the estimation of equation (5), excluding the measures of regional exposure to tariff liberalization. All regressions are estimated by 2SLS, and growth in Chinese imports (ΔIPW_{ui}, defined by equation (3)) is instrumented by growth in Chinese exports to non-U.S. high-income markets (defined by equation (4)). The share of employment in routine occupations in 1990 is instrumented by the measure of commuting zone historical industry structure defined by equation (6) in Appendix A.D. Each column includes all control variables used in Table 1. Standard errors are clustered by state and observations are weighted by 1990 population in each commuting zone. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

Table A.18: NAFTA Tariff Liberalization and Change in Share of Task Employment in the Working-Age Population: 2SLS First Stage Estimates.

Panel A: Dependent Variable: Change in Chinese import exposure per worker, ΔIPW_{ui}

	(1)
ΔIPW$_{oi}$	0.715***
	(0.156)

Panel B: Dependent Variable: Share of 1990 employment in routine occupations

	(1)
$\widetilde{RSH_i}$	14.824***
	(2.122)

Notes: $N = 722$. This table reports the results of the first stage for the 2SLS estimation of equation (5) corresponding to column 1 in Table 8, which uses growth in Chinese imports by eight developed countries (ΔIPW$_{oi}$) as an instrument for growth in Chinese imports by the U.S. (ΔIPW$_{ui}$) and historical industry structure defined by equation (6) in Appendix A.D as an instrument for the 1990 share of employment in routine occupations. In both panels, the measures of exposure to tariff liberalization are defined by equations (1) and (2). Each column includes all control variables used in Table 1. Standard errors are clustered by state and observations are weighted by 1990 population in each commuting zone. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

Table A.19: NAFTA Tariff Liberalization and Change in Employment Status in the Working-Age Population: 1990–2007

Dependent Variable: Change in population shares by employment status (in % pts)

	Manufacturing		Nonmanufacturing		Employment		Unemployment		Not in the Labor Force	
	1990–2000	1990–2007	1990–2000	1990–2007	1990–2000	1990–2007	1990–2000	1990–2007	1990–2000	1990–2007
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
τ^{US}	-0.904***	-1.578***	0.518***	1.062***	-0.386	-0.516**	0.204**	-0.008	0.181	0.524**
	(0.285)	(0.349)	(0.200)	(0.361)	(0.246)	(0.248)	(0.098)	(0.132)	(0.194)	(0.207)
τ^{MEX}	0.531**	0.788***	-0.595*	-0.956**	-0.065	-0.168	-0.007	0.119	0.072	0.049
	(0.213)	(0.285)	(0.352)	(0.415)	(0.301)	(0.370)	(0.114)	(0.154)	(0.290)	(0.305)

Notes: $N = 722$. This table reports the results of the estimation of equation (5). The dependent variables are the change in the share in the working-age population of manufacturing employment (columns 1-2), of nonmanufacturing employment (columns 3-4), of total employment (columns 5-6), of unemployment (columns 7-8) and of the number of individuals not in the labor force (columns 9-10). In columns 1, 3, 5, 7, and 9 the dependent variable is computed over 1990–2000 and the results are equivalent to Table 4. In columns 2, 4, 6, 8, and 10 the dependent variable is computed over 1990–2007. The measures of exposure to tariff liberalization are defined by equations (1) and (2) and are computed over 1990–2007. All columns are estimated by 2SLS, and growth in Chinese imports (ΔIPW_{ui}, defined by equation (3)) is instrumented by growth in Chinese exports to non-U.S. high-income markets (defined by equation (4)). Growth in Chinese imports (and its instrument) is computed over 1990–2000 in columns 1, 3, 5, 7, and 9 and over 1990–2007 in columns 2, 4, 6, 8, and 10. Each column includes all control variables used in Table 1. Standard errors are clustered by state and observations are weighted by 1990 population in each commuting zone. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

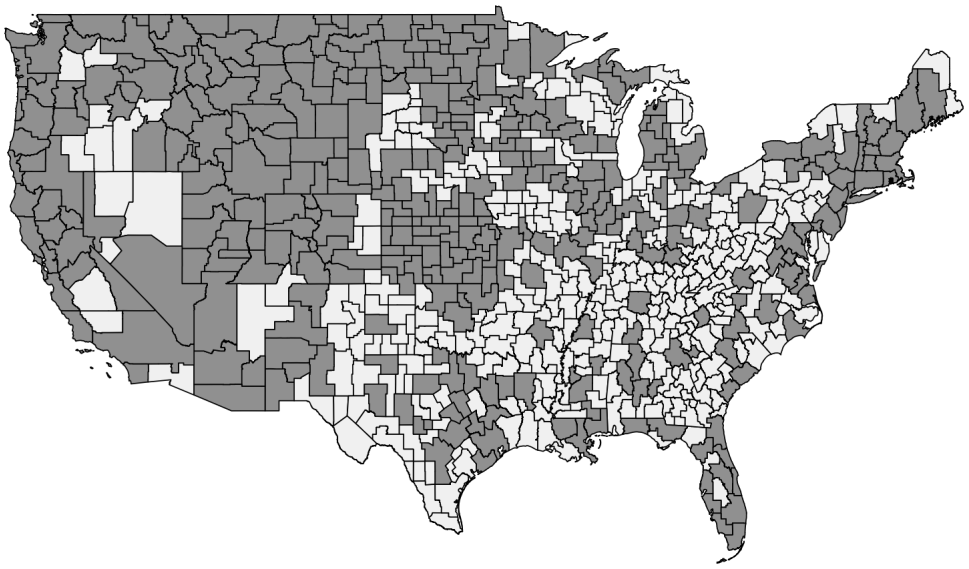
Table A.20: NAFTA Tariff Liberalization and Change in Employment Status in the Working-Age Population by Gender among the No College Sample

Dependent Variable: Change in population shares by employment status (in % pts)

	Manufacturing	Nonmanufacturing	Employment	Unemployment	Not in the Labor Force
	(1)	(2)	(3)	(4)	(5)
Panel A: No college education and female					
$\Delta\tau^{\text{US}}$	2.062***	-0.313	1.749***	-0.344***	-1.404***
	(0.329)	(0.303)	(0.337)	(0.098)	(0.298)
$\Delta\tau^{\text{MEX}}$	0.210	-0.324	-0.115	0.116	-0.001
	(0.297)	(0.451)	(0.412)	(0.131)	(0.388)
ΔIPW	-0.591***	0.053	-0.538**	-0.088	0.626***
	(0.177)	(0.266)	(0.247)	(0.103)	(0.231)
Panel B: No college education and male					
$\Delta\tau^{\text{US}}$	0.258	-0.032	0.226	-0.405**	0.178
	(0.394)	(0.271)	(0.411)	(0.176)	(0.352)
$\Delta\tau^{\text{MEX}}$	-0.561	0.398	-0.163	0.201	-0.038
	(0.360)	(0.501)	(0.555)	(0.194)	(0.534)
ΔIPW	0.232	0.259	0.491	-0.175	-0.316
	(0.306)	(0.358)	(0.405)	(0.181)	(0.296)

Notes: $N = 722$. This table reports the results of the estimation of equation (5). The dependent variables are the change in the share in the working-age population of manufacturing employment (column 1), of nonmanufacturing employment (column 2), of total employment (column 3), of unemployment (column 4) and of the number of individuals not in the labor force (column 5). The measures of exposure to tariff liberalization are defined by equations (1) and (2). All columns are estimated by 2SLS, and growth in Chinese imports (ΔIPW_{ui}, defined by equation (3)) is instrumented by growth in Chinese exports to non-U.S. high-income markets (defined by equation (4)). Each column includes all control variables used in Table 1. Standard errors are clustered by state and observations are weighted by 1990 population in each commuting zone. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

Figure A.2: High and Low Human Capital Commuting Zones



Notes: A darker (lighter) shade indicates high (low) human capital in 1990. High (low) human capital commuting zones are those with an above (below) median share of working-age population with college education in 1990.

Table A.21: NAFTA Tariff Liberalization and Change in Employment Status in the Working-Age Population: Exposure–Robust Standard Errors [Borusyak et al., 2022b]

Dependent Variable: Change in population shares by employment status (in % pts)

	Manufacturing	Nonmanufacturing	Employment	Unemployment	Not in the Labor Force
	(1)	(2)	(3)	(4)	(5)
Panel A: All					
$\Delta\tau^{US}$	0.907***	-0.449	0.458**	-0.242***	-0.216
	(0.343)	(0.373)	(0.205)	(0.088)	(0.168)
$\Delta\tau^{MEX}$	-0.325	0.314	-0.012	0.097	-0.085
	(0.518)	(0.657)	(0.326)	(0.207)	(0.228)
Panel B: No college education					
$\Delta\tau^{US}$	1.202***	-0.239	0.964***	-0.376***	-0.588***
	(0.373)	(0.341)	(0.245)	(0.091)	(0.213)
$\Delta\tau^{MEX}$	-0.129	0.049	-0.080	0.151	-0.071
	(0.583)	(0.655)	(0.414)	(0.214)	(0.284)
Panel C: College education					
$\Delta\tau^{US}$	0.103	-0.283	-0.180	-0.068	0.248
	(0.314)	(0.323)	(0.199)	(0.097)	(0.199)
$\Delta\tau^{MEX}$	-0.791*	0.568	-0.223	0.024	0.198
	(0.457)	(0.486)	(0.229)	(0.203)	(0.249)
Panel D: Female					
$\Delta\tau^{US}$	1.703***	-0.617*	1.086***	-0.187**	-0.899***
	(0.283)	(0.354)	(0.202)	(0.078)	(0.175)
$\Delta\tau^{MEX}$	0.176	-0.151	0.026	0.029	-0.054
	(0.370)	(0.518)	(0.316)	(0.181)	(0.267)
Panel E: Male					
$\Delta\tau^{US}$	0.103	-0.246	-0.143	-0.293**	0.436*
	(0.424)	(0.422)	(0.253)	(0.117)	(0.223)
$\Delta\tau^{MEX}$	-0.871	0.793	-0.078	0.172	-0.094
	(0.711)	(0.818)	(0.406)	(0.268)	(0.319)
Panel F: Nonwhite					
$\Delta\tau^{US}$	0.690	0.373	1.063**	-0.625***	-0.438
	(0.507)	(0.662)	(0.439)	(0.187)	(0.453)
$\Delta\tau^{MEX}$	0.366	-1.227	-0.861	-0.286	1.147
	(0.774)	(1.210)	(0.797)	(0.322)	(0.768)
Panel G: White					
$\Delta\tau^{US}$	0.891***	-0.549*	0.342**	-0.186**	-0.156
	(0.299)	(0.291)	(0.165)	(0.085)	(0.158)
$\Delta\tau^{MEX}$	-0.518	0.606	0.088	0.141	-0.229
	(0.450)	(0.521)	(0.216)	(0.221)	(0.258)

Notes: $N = 722$. This table reports the results of the estimation of equation (5). Exposure–robust standard errors are obtained estimating equivalent industry–level regressions using the procedure in [Borusyak et al., 2022b] and clustering standard errors by SIC 3–digit level. The dependent variables are the change in the share in the working-age population of manufacturing employment (column 1), of nonmanufacturing employment (column 2), of total employment (column 3), of unemployment (column 4) and of the number of individuals not in the labor force (column 5). The measures of exposure to tariff liberalization are defined by equations (1) and (2). All columns are estimated by 2SLS, and growth in Chinese imports (ΔIPW_{ui}, defined by equation (3)) is instrumented by growth in Chinese exports to non-U.S. high-income markets (defined by equation (4)). Each column includes all control variables used in Table 1. Observations are weighted by 1990 population in each commuting zone. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

Table A.22: NAFTA Tariff Liberalization and Change in Working-Age Population: Exposure–Robust Standard Errors [Borusyak et al., 2022b]

Dependent Variable: Change in log population counts (in log points)

	All	No College	College
	(1)	(2)	(3)
$\Delta\tau^{\text{US}}$	-0.488	0.506	-1.608
	(1.286)	(1.601)	(0.988)
$\Delta\tau^{\text{MEX}}$	-0.750	-1.352	-0.150
	(2.106)	(2.514)	(1.830)

Notes: $N = 722$. This table reports the results of the estimation of equation (5). Exposure–robust standard errors are obtained estimating equivalent industry–level regressions using the procedure in [Borusyak et al., 2022b] and clustering standard errors by SIC 3–digit level. The dependent variable is the log change in the working-age population. The measures of exposure to tariff liberalization are defined by equations (1) and (2). All columns are estimated by 2SLS and growth in Chinese imports (ΔIPW_{ui}, defined by equation (3)) is instrumented by growth in Chinese exports to non-U.S. high-income markets (defined by equation (4)). Each column includes all control variables used in Table 1. Observations are weighted by 1990 population in each commuting zone. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

Table A.23: NAFTA Tariff Liberalization and Change in Share of Industry Employment in the Working-Age Population: Exposure–Robust Standard Errors [Borusyak et al., 2022b]

Dependent Variable: Change in industry emp/working-age pop (in % pts)

	Construction	Transportation and Utilities	Wholesale and Retail Trade	Other Services	Government
	(1)	(2)	(3)	(4)	(5)
$\Delta\tau^{\text{US}}$	-0.140***	0.033	-0.211**	-0.061	0.043
	(0.052)	(0.073)	(0.092)	(0.254)	(0.080)
$\Delta\tau^{\text{MEX}}$	-0.134	-0.060	-0.005	0.133	0.079
	(0.088)	(0.117)	(0.210)	(0.438)	(0.125)

Notes: $N = 722$. This table reports the results of the estimation of equation (5). Exposure–robust standard errors are obtained estimating equivalent industry–level regressions using the procedure in [Borusyak et al., 2022b] and clustering standard errors by SIC 3–digit level. The dependent variables are the change in the share in the working-age population of employment in construction, in transportation and utilities, in wholesale and retail trade, in other services, or in government. The measures of exposure to tariff liberalization are defined by equations (1) and (2). All regressions are estimated by 2SLS, and growth in Chinese imports (ΔIPW_{ui}, defined by equation (3)) is instrumented by growth in Chinese exports to non-U.S. high-income markets (defined by equation (4)). Each column includes all control variables used in Table 1. Observations are weighted by 1990 population in each commuting zone. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

Table A.24: NAFTA Tariff Liberalization and Change in Share of Task Employment in the Working-Age Population: Exposure–Robust Standard Errors [Borusyak et al., 2022b]

Dependent Variable: Change in occupational emp/working-age pop (in % pts)

			By educ. attainment		By sector	
	All	All	Noncollege	College	Mfg.	Nonmfg.
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Primarily abstract occupations.						
(Share of working-age population employed in managerial/professional/ technical occupations.)						
$\Delta\tau^{US}$	-0.535***	-0.393***	-0.132*	-0.601***	-0.130	-0.393***
	(0.132)	(0.136)	(0.076)	(0.197)	(0.080)	(0.144)
$\Delta\tau^{MEX}$	0.256	0.067	-0.096	0.178	-0.176	0.361
	(0.198)	(0.207)	(0.116)	(0.274)	(0.139)	(0.237)
Panel B: Primarily routine occupations.						
(Share of working-age population employed in clerical/retail sales occupations.)						
$\Delta\tau^{US}$	-0.087	-0.023	-0.122	0.135	-0.060	0.003
	(0.146)	(0.136)	(0.164)	(0.155)	(0.056)	(0.152)
$\Delta\tau^{MEX}$	-0.088	-0.173	-0.022	-0.096	-0.021	-0.054
	(0.221)	(0.210)	(0.260)	(0.229)	(0.088)	(0.231)
Panel C: Primarily routine occupations.						
(Share of working-age population employed in production occupations.)						
$\Delta\tau^{US}$	0.880***	0.894***	1.062***	0.290***	0.819***	0.007
	(0.233)	(0.195)	(0.312)	(0.107)	(0.233)	(0.026)
$\Delta\tau^{MEX}$	0.226	0.207	0.276	-0.030	0.382	0.004
	(0.303)	(0.275)	(0.431)	(0.128)	(0.380)	(0.055)
Panel D: Primarily manual occupations.						
(Share of working-age population employed in craft/mechanics/agricultural/service occupations.)						
$\Delta\tau^{US}$	-0.127	-0.020	-0.218	-0.157	0.133	-0.235*
	(0.108)	(0.098)	(0.142)	(0.123)	(0.087)	(0.130)
$\Delta\tau^{MEX}$	0.030	-0.113	0.259	-0.071	0.101	-0.119
	(0.195)	(0.167)	(0.260)	(0.224)	(0.147)	(0.214)

Notes: $N = 722$. This table reports the results of the estimation of equation (5). Exposure–robust standard errors are obtained estimating equivalent industry–level regressions using the procedure in [Borusyak et al., 2022b] and clustering standard errors by SIC 3–digit level. The dependent variables are the change in the share in the working-age population of employment in primarily abstract occupations (panel A), primarily clerical and sales-related routine occupations (panel B), primarily production-related routine occupations (panel C) and primarily manual occupations (panel D). The measures of exposure to tariff liberalization are defined by equations (1) and (2). All regressions are estimated by 2SLS, and growth in Chinese imports (ΔIPW_{ui}, defined by equation (3)) is instrumented by growth in Chinese exports to non-U.S. high-income markets (defined by equation (4)). In columns 1 and 3 through 6 the share of employment in routine occupations in 1990 is instrumented by the measure of commuting zone historical industry structure defined by equation (6) in Appendix A.D. Each column includes all control variables used in Table 1. Observations are weighted by 1990 population in each commuting zone. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

Table A.25: NAFTA Tariff Liberalization and Change in Employment Status in the Working-Age Population: 1990–2007; Exposure–Robust Standard Errors [Borusyak et al., 2022b]

Dependent Variable: Change in population shares by employment status (in % pts)

	Manufacturing		Nonmanufacturing		Employment		Unemployment		Not in the Labor Force	
	1990–2000	1990–2007	1990–2000	1990–2007	1990–2000	1990–2007	1990–2000	1990–2007	1990–2000	1990–2007
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$\Delta\tau^{US}$	0.907***	1.606***	-0.449	-1.041**	0.458**	0.565*	-0.242***	0.027	-0.216	-0.592***
	(0.343)	(0519)	(0.373)	(0.474)	(0.205)	(0.298)	(0.088)	(0.104)	(0.168)	(0.220)
$\Delta\tau^{MEX}$	-0.325	-0.545	0.314	0.666	-0.012	0.121	0.097	-0.176	-0.085	0.055
	(0.518)	(0.602)	(0.657)	(0.769)	(0.326)	(0.571)	(0.207)	(0.161)	(0.228)	(0.459)

Notes: $N = 722$. This table reports the results of the estimation of equation (5). Exposure–robust standard errors are obtained estimating equivalent industry–level regressions using the procedure in [Borusyak et al., 2022b] and clustering standard errors by SIC 3–digit level. The dependent variables are the change in the share in the working-age population of manufacturing employment (columns 1-2), of nonmanufacturing employment (columns 3-4), of total employment (columns 5-6), of unemployment (columns 7-8) and of the number of individuals not in the labor force (columns 9-10). In columns 1, 3, 5, 7, and 9 the dependent variable is computed over 1990–2000 and the results are equivalent to Table 4. In columns 2, 4, 6, 8, and 10 the dependent variable is computed over 1990–2007. The measures of exposure to tariff liberalization are defined by equations (1) and (2) and are computed over 1990–2000. All columns are estimated by 2SLS, and growth in Chinese imports (ΔIPW_{ui}, defined by equation (3)) is instrumented by growth in Chinese exports to non-U.S. high-income markets (defined by equation (4)). Growth in Chinese imports (and its instrument) is computed over 1990–2000 in columns 1, 3, 5, 7, and 9 and over 1990–2007 in columns 2, 4, 6, 8, and 10. Each column includes all control variables used in Table 1. Observations are weighted by 1990 population in each commuting zone. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

Table A.26: NAFTA Tariff Liberalization and Change in Share of Manufacturing Employment in the Working-Age Population: Alternative Levels of Clustering for Exposure–Robust Standard Errors [Borusyak et al., 2022b]

Dependent Variable: Change in manufacturing emp/working-age pop (in % pts)

	(1)	(2)	(3)
$\Delta\tau^{\text{US}}$	0.907***	0.907*	0.907*
	(0.343)	(0.504)	(0.483)
$\Delta\tau^{\text{MEX}}$	-0.325	-0.325	-0.325
	(0.518)	(0.645)	(0.701)
Std. errors clustered by:	SIC3	SIC2	SIC group

Notes: $N = 722$. This table reports the results of the estimation of equation (5). Exposure–robust standard errors are obtained estimating equivalent industry–level regressions using the procedure in [Borusyak et al., 2022b] and clustering standard errors by SIC 3–digit level, SIC 2–digit level, or by the ten SIC groups used in Borusyak et al. [2022b] and originally defined by Acemoglu et al. [2016]. The dependent variable is the change in the share in the working-age population of manufacturing employment. The measures of exposure to tariff liberalization are defined by equations (1) and (2). All columns are estimated by 2SLS, and growth in Chinese imports (ΔIPW_{ui}, defined by equation (3)) is instrumented by growth in Chinese exports to non-U.S. high-income markets (defined by equation (4)). Each column includes all control variables used in Table 1. Observations are weighted by 1990 population in each commuting zone. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

Table A.27: Shock Summary Statistics Following Borusyak et al. [2022b]

	$\Delta\tau^{\text{US}}$	$\Delta\tau^{\text{MEX}}$
Mean	-2.269	-12.681
Standard deviation	4.168	6.256
Interquartile range	2.447	4.249
Effective sample size (1/HHI of $s_j = \frac{L_j}{L}$ weights)		
Across Industries	126.541	126.541
Across SIC3 groups	64.841	64.841
Largest $s_j = \frac{L_j}{L}$ weight		
Across Industries	0.031	0.031
Across SIC3 groups	0.041	0.041
Observation counts		
# of shocks	397	397
# of industries	397	397
# of SIC3 groups	136	136

Notes: This table summarizes the industry–level tariff changes between 1990 and 2000 across 397 manufacturing industries following Borusyak et al. [2022b]. All statistics are weighted by the employment shares of each industry over total employment $s_j = \frac{L_j}{L}$ in 1990. Following Borusyak et al. [2022b]'s terminology, the effective sample size refers to one over the Herfindahl–Hirschman index of employment shares $s_j = \frac{L_j}{L}$, normalized to add up to one (recall the nonmanufaturing sector is omitted).

Table A.28: Shock Balance Tests: Regional Balance

	$\Delta\tau^{US}$		$\Delta\tau^{MEX}$	
	(1)	(2)	(3)	(4)
Percentage of college–educated population$_{1990}$	3.083***	2.029	3.166	-0.389
	(0.602)	(4.022)	(3.294)	(3.114)
Percentage of foreign–born population$_{1990}$	-0.759	0.226	-5.265	-1.336
	(1.085)	(7.592)	(3.858)	(5.685)
Percentage of employment among women$_{1990}$	1.413**	2.427	-0.535	-3.474
	(0.650)	(4.645)	(2.656)	(3.425)
Percentage of employment in routine occupations$_{1990}$	0.469	0.628	-1.093	-2.653
	(0.342)	(2.195)	(1.575)	(2.072)
Average offshorability index of occupations$_{1990}$	0.023	0.051	-0.321	-0.483*
	(0.041)	(0.229)	(0.199)	(0.256)
Manufacturing employment growth, 1970–1980	-0.163	0.413	-0.073	0.936
	(0.121)	(0.790)	(0.890)	(0.868)
Manufacturing employment growth, 1980–1990	-0.264	-0.156	-1.261	-0.546
	(0.208)	(1.211)	(1.138)	(1.072)

Notes: $N = 722$. The first five rows report regressions of each regional control variable used in Table 1 as the dependent variable on the measures of regional exposure to U.S. (columns 1 and 2) or Mexico's (columns 3 and 4) tariff changes defined by equations (1) and (2). In the last two rows, the dependent variables are growth in manufacturing employment as a share of the working–age population in each commuting zone during 1970–1980 or 1980–1990 respectively. These regressions control for the regional share of manufacturing employment in total employment in 1990. I use Borusyak et al. [2022b]'s transformation to estimate equivalent industry–level regressions, with weights equal to employment shares, controlling for dummy variables for ten SIC groups in columns 2 and 4, and clustering standard errors at the SIC 3–digit level. The ten sic groups are used in Borusyak et al. [2022b] and originally defined by Acemoglu et al. [2016]. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

Table A.29: NAFTA Tariff Liberalization and Change in Share of Manufacturing Employment in the Working-Age Population: Excluding Percentage of College–Educated Population and Percentage of Employment Among Women

Dependent Variable: Change in manufacturing emp/working-age pop (in % pts)

	(1)	(2)
$\Delta\tau^{\text{US}}$	0.959***	0.959***
	(0.275)	(0.343)
$\Delta\tau^{\text{MEX}}$	-0.341	-0.341
	(0.220)	(0.523)
Exposure–robust S.E.:	No	Yes

Notes: $N = 722$. This table reports the results of the estimation of equation (5), without controlling for the percentage of college–educated population and the percentage of employment among women. In column 1, standard errors are clustered by state. In column 2, exposure–robust standard errors are obtained estimating equivalent industry–level regressions using the procedure in [Borusyak et al., 2022b] and clustering standard errors by SIC 3–digit level. The dependent variable is the change in manufacturing employment as a share of the working-age population. The measures of exposure to tariff liberalization are defined by equations (1) and (2). All columns are estimated by 2SLS, and growth in Chinese imports (ΔIPW_{ui}, defined by equation (3)) is instrumented by growth in Chinese exports to non-U.S. high-income markets (defined by equation (4)). Each column includes all control variables used in Table 1 except for the percentage of college–educated population and percentage of employment among women. Observations are weighted by 1990 population in each commuting zone. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

A.J. Additional control variables

The following table includes additional control variables to the estimation of equation (5). Since these are industry–level control variables, I define measures of regional exposure as employment–weighted averages following Borusyak et al. [2022b]. Weights are employment shares of each industry in each region in the initial period (1990). In addition, when computing exposure–robust standard errors, I use Borusyak et al. [2022b]'s procedure to transform the data and estimate equivalent industry–level regressions across 397 manufacturing industries, including the additional industry–level controls directly and clustering standard errors by SIC 3–digit industries.

These additional control variables are constructed as follows. Change in world demand between 1990 and 2000 is computed as the percent change in world imports in each SIC industry.[86] Change in world employment considers percent change in employment between 1990 and 2000 in a set of high income countries.[87] This is computed as a weighted average across countries for each industry, with weights equal to country–industry employment in 1990. Changes in U.S. MFN tariffs between 1990 and 2000 are computed using data from Romalis [2007] at the 8-digit level of the U.S. tariff schedule. These are aggregated to HS 6-digit codes using U.S. HS 8-digit imports as weights.[88] I then construct industry-level tariffs for 397 4-digit SIC manufacturing industries using the concordance provided by Autor et al. [2013]. The ten sic groups are used in Borusyak et al. [2022b] and originally defined by Acemoglu et al. [2016].

The results are shown in Table A.30.

[86] I use a concordance provided by Autor et al. [2013] to assign trade flows from the 1988/1992 version of the Harmonized System ("H0") to SIC industries. The trade data are obtained from the UN's Comtrade database through the World Bank's World Integrated Trade Solution (WITS). They are downloaded using the SITC revision 2 classification, given that in 1990 only some countries report trade using the Harmonized System. I then use a concordance between SITC Tier 4 codes and the 1988/1992 HS Classification 6-digit codes.

[87] Data on employment by industry and country is obtained from the Trade Production and Protection database [Nicita and Olarreaga, 2007], which uses ISIC revision 2 3–digit codes. These are then translated to SIC 2–digit industries. Countries considered correspond to all those classified as "high income" by the World Bank excluding those with no coverage in Nicita and Olarreaga [2007]. They include Austria, Australia, Belgium, Canada, Chile, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Israel, Italy, Japan, South Korea, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

[88] Data on U.S. imports in 1990 used to construct weights are a product of the U.S. Census Bureau and obtained from Schott [2008].

Table A.30: NAFTA Tariff Liberalization and Change in Share of Manufacturing Employment in the Working-Age Population: Additional Controls

Dependent Variable: Change in manufacturing emp/working-age pop (in % pts)

	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta\tau^{US}$	0.777**	0.890***	1.204***	0.777**	0.890***	1.204*
	(0.337)	(0.251)	(0.459)	(0.379)	(0.295)	(0.698)
$\Delta\tau^{MEX}$	-0.079	-0.160	-0.165	-0.079	-0.160	-0.165
	(0.213)	(0.204)	(0.280)	(0.545)	(0.420)	(0.307)
Controlling for:						
Regional Exposure to Change in World Demand	Yes	No	Yes	Yes	No	Yes
Regional Exposure to Change in US MFN Tariff	Yes	No	Yes	Yes	No	Yes
Regional Exposure to Change in World Employment	Yes	No	Yes	Yes	No	Yes
Lagged CZ Mftg Emp. Growth in 1970s and 1980s	No	Yes	Yes	No	Yes	Yes
Regional Exposure to ten SIC Groups	No	No	Yes	No	No	Yes
Exposure–robust S.E.:	No	No	No	Yes	Yes	Yes

Notes: $N = 722$. This table reports the results of the estimation of equation (5) with additional control variables. These include regional exposure to i) changes in industry–level world demand (defined as percent change in world imports) over 1990–2000, ii) changes in employment in high income countries other than the U.S. (defined as a weighted average across countries of percent change in employment in each industry), iii) changes in U.S. most favored nation (MFN) tariffs between 1990 and 2000, and iv) dummies for ten SIC groups used in Borusyak et al. [2022b] and originally defined by Acemoglu et al. [2016]. In addition, I control for growth in commuting zone manufacturing employment as a share of the working–age population during 1970–1980 and during 1980–1990. Note that in columns 1 through 3 standard errors are clustered by state and, following Borusyak et al. [2022b], the measures of regional exposure to industry–level variables (in columns 1 and 3) are employment–weighted averages of the industry–level variables. In columns 4 through 6, exposure–robust standard errors are obtained estimating equivalent industry–level regressions using the procedure in [Borusyak et al., 2022b] and clustering standard errors by SIC 3–digit level, such that industry–level controls in columns 4 and 6 can be included directly in the regression. The dependent variable is the change in manufacturing employment as a share of the working-age population. The measures of exposure to tariff liberalization are defined by equations (1) and (2). All columns are estimated by 2SLS, and growth in Chinese imports (ΔIPW_{ui}, defined by equation (3)) is instrumented by growth in Chinese exports to non-U.S. high-income markets (defined by equation (4)). Each column includes all control variables used in Table 1 plus the additional control variables described earlier. Observations are weighted by 1990 population in each commuting zone. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

A.K. Tariff level vs. tariff changes

Table A.31 revisits the estimation of equation (5) contrasting the results obtained using a measure of regional exposure to *changes* in tariffs as in the main text, a measure of exposure to the initial (1990) *level* in tariffs, or both simultaneously. The measure of exposure to the initial level in tariffs is defined as $\tau_i^{U.S.} = \sum_{j \in J} \frac{L_{ij}\tau_j^{U.S.}}{L_i}$ where $\tau_j^{U.S.}$ stands for the tariff level in 1990 in industry j. I focus on exposure to U.S. tariff liberalization, which is the statistically significant coefficient in the main text results.

As argued in the main text, the preferred specification used throughout the paper uses exposure to the change in tariffs. Because tariff liberalization was nearly complete, the correlation between the measure with changes and the measure with levels is nearly (minus) one (-0.998). For that reason, the coefficients shown in Table A.31 with the share of manufacturing employment in the working–age population as the dependent variable are nearly identical (see columns 1 and 2). In contrast, the coefficient on the measures using tariff change and level are about four and three times larger when including both simultaneously (see column 3).

Table A.31: NAFTA Tariff Liberalization and Change in Share of Manufacturing Employment in the Working-Age Population: Tariff Change and Tariff Level

Dependent Variable: Change in manufacturing emp/working-age pop (in % pts)

	(1)	(2)	(3)
$\Delta\tau^{US}$	0.907***		3.860*
	(0.305)		(2.267)
τ^{US}		-0.840***	2.858
		(0.302)	(2.313)

Notes: $N = 722$. This table reports the results of the estimation of equation (5). The dependent variable is the change in manufacturing employment as a share of the working-age population. The measure of exposure to U.S. tariff liberalization is defined by equation (1) or alternatively by $\tau_i^{U.S.} = \sum_{j \in J} \frac{L_{ij}\tau_j^{U.S.}}{L_i}$ where $\tau_j^{U.S.}$ stands for the tariff level in 1990 in industry j. The measures of exposure to Mexico's tariff liberalization is defined by equation (2). All columns are estimated by 2SLS, and growth in Chinese imports (ΔIPW$_{ui}$, defined by equation (3)) is instrumented by growth in Chinese exports to non-U.S. high-income markets (defined by equation (4)). Each column includes all control variables used in Table 1. Standard errors are clustered by state and observations are weighted by 1990 population in each commuting zone. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

A.L. Geographic and Industry Aggregation

By using data on 397 SIC 4-digit manufacturing industries and 722 commuting zones, I create more disaggregate measures of exposure to tariff liberalization than the previous literature [Hakobyan and McLaren, 2016], which uses data on 89 census industries and 540 CONSPUMAs. Table A.32 shows that this makes a difference for finding employment effects of NAFTA. To show this, I construct tariff exposure measures and control variables using the 89 census industries and 522 CONSPUMAs. I estimate regression (5) focusing on manufacturing employment as a share of the working–age population and on total employment as a share of the working–age population. Column 1 is equivalent to column 1 in Table 1 and shows a statistically significant decline in manufacturing employment for regions more exposed to U.S. tariff liberalization. Column 3 uses the more aggregate measure (with census industries and CONSPUMAs) and finds a coefficient of the same sign and magnitude but which is not statistically significant.[89] In the case of total employment, once again only the more disaggregate measure leads to a statistically significant coefficient, as shown in columns 2 and 4. In addition, there is a large difference in the magnitudes, which imply a 0.1 (column 2) or 0.04 (column 4) percentage point decline in total employment as a share of the working–age population in regions at the 75th percentile relative to the 25th percentile of exposure. Summing up, the further disaggregation of industries and geographic units plays a crucial role in establishing the employment effects of NAFTA.

Table A.32: NAFTA Tariff Liberalization and Change in Share of Manufacturing and Total Employment in the Working-Age Population: Aggregation

Dependent Variable: Change in manufacturing or total emp/working-age pop (in % pts)

	CZ+SIC4 Industries		CONSPUMA+Census Industries	
	Mftg. Emp.	Total Emp.	Mftg. Emp.	Total Emp.
	(1)	(2)	(3)	(4)
$\Delta\tau^{US}$	0.790**	0.456*	0.646	0.153
	(0.318)	(0.267)	(0.444)	(0.756)
Observations	722	722	540	540

Notes: This table reports the results of the estimation of equation (5). The dependent variable is the change in manufacturing employment or total employment as a share of the working-age population. The measure of exposure to U.S. tariff liberalization is defined by equation (1) using 327 industries and 722 commuting zones as in the main text (in columns 1 and 2) or 89 industries and 522 CONSPUMAs (in columns 3 and 4). All columns are estimated by OLS. Each column includes all control variables used in Table 1. Standard errors are clustered by state and observations are weighted by 1990 population in each commuting zone or CONSPUMA. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.

[89] These coefficients imply a 0.17 (column 1) or 0.16 (column 3) percentage point decline in manufacturing employment as a share of the working–age population in regions at the 75th percentile relative to the 25th percentile of exposure.

A.M. Gender–specific Exposure to Tariff Liberalization

The results in column 1 in panels C and D in Table 5 show that the effect of U.S. tariff cuts is large and statistically significant among women, and much smaller and not statistically significant among men.

One possibility is that tariff cuts are concentrated in industries which disproportionately employ women. Another option is that facing similar shocks, female employment responds different than male employment.

To shed light on this issue, it is convenient to decompose the measure of regional exposure to U.S. tariff liberalization in equation (1) into the following two additive components that weigh employment by the share of female and male employment by commuting zone and industry respectively:

$$\Delta\tau_i^{U.S.,\,f} = \sum_{j\,\epsilon\,J} \frac{(f_{ij})L_{ij}\Delta\tau_j^{U.S.}}{L_i} \ , \tag{16}$$

and

$$\Delta\tau_i^{U.S.,m} = \sum_{j\,\epsilon\,J} \frac{(1-f_{ij})L_{ij}\Delta\tau_j^{U.S.}}{L_i} \ . \tag{17}$$

This approach follows Autor et al. [2019] (see their equation (2)). To implement this, I define f_{ij} as the share of female employment in industry j and commuting zone i.[90]

Table A.33 shows descriptive statistics for each component. First, note the mean across commuting zones of $\Delta\tau_i^{U.S.,\,f}$ and $\Delta\tau_i^{U.S.,\,m}$ is nearly the same. These statistics are computed weighing by commuting zone population in 1990. Without these weights, the means are -0.34 for the female component and -0.28 for the male component.

Second, Table A.34 estimates equation (5) for female and male manufacturing employment as shares of the corresponding working–age population. Columns 1 and 3 are equivalent to column 1 in panels C and D in Table 5. Column 2 and 4 replace the measure of exposure to U.S. tariff liberalization in equation (1) into its two additive components in equations (16) and (17) . The results show that only the measure of tariff liberalization weighted by female employment shares leads to a decline in female manufacturing employment. For male employment, the coefficients on both measures are not statistically significant.

[90]Following Autor et al. [2019] these shares are computed from the U.S. Census. I use concordances provided by Autor et al. [2019] to go from 1990 Census industries to SIC 4–digit industries. Note that because gender employment shares are computed from Census data and employment weights are computed from CBP data, there are few cases in which the Census does not report employment for a certain industry and commuting zone while CBP does. In those cases I assign gender employment shares corresponding to the same commuting zone and the corresponding 3–digit SIC industry, the same commuting zone and the corresponding SIC 2–digit industry, or the corresponding SIC 3–digit industry at a national level, in that order of priority.

In conclusion, the large decline in manufacturing employment in response to U.S. tariff liberalization for women, and the lack of an effect for men, appears to be due not to the difference in the magnitude of the shock experienced by each group based on the industries in which they are employed in 1990. Instead, the response of female and male manufacturing employment is different. Future work could look at gender differences in displacement from the manufacturing sector in this or other contexts.

Table A.33: Summary Statistics for Measures of Regional Exposure to Tariff Liberalization by Gender

	Defined by equation	Mean	St. Dev.	p10	p25	p50	p75	p90
$\Delta\tau^{\text{US, f}}$	(16)	-0.224	0.34	-0.52	-0.21	-0.11	-0.08	-0.04
$\Delta\tau^{\text{US, m}}$	(17)	-0.224	0.22	-0.43	-0.26	-0.16	-0.11	-0.08

Notes: This table reports summary statistics of the distribution of the measures of exposure to U.S. tariff liberalization between 1990 and 2000 based on gender employment shares. These statistics are weighted by 1990 population in each commuting zone.

Table A.34: NAFTA Tariff Liberalization and Change in Share of Manufacturing Employment in the Working-Age Population with Gender–Specific Tariff Exposure Measures

Dependent Variable: Change in manufacturing emp/working-age pop (in % pts)

	Female		Male	
	(1)	(2)	(3)	(4)
$\Delta\tau^{\text{US}}$	1.703***		0.103	
	(0.252)		(0.373)	
$\Delta\tau^{\text{US, f}}$		2.436***		0.056
		(0.444)		(0.570)
$\Delta\tau^{\text{US, m}}$		0.552		0.176
		(0.555)		(0.844)

Notes: $N = 722$. This table reports the results of the estimation of equation (5). The dependent variable is the change in manufacturing employment as a share of the working-age population. The measure of exposure to U.S. tariff liberalization is defined by equation (1) in columns 1 and 3 and by equations (16) and (17) in columns 2 and 4. The measure of exposure to Mexico's tariff liberalization is defined by equation (2). All columns are estimated by 2SLS, and growth in Chinese imports (ΔIPW_{ui}, defined by equation (3)) is instrumented by growth in Chinese exports to non-U.S. high-income markets (defined by equation (4)). Each column includes all control variables used in Table 1. Standard errors are clustered by state and observations are weighted by 1990 population in each commuting zone. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level.