How Does Globalization Affect Educational Attainment? Evidence from China

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Did globalization alter educational attainment in China?

This Paper

- ▶ Motivation:
  - ▶ Education offers platform for long-run growth: Lucas (1988)
  - ▶ Developing countries liberalized trade as a growth strategy
  - ▶ Trade causes fundamental and lasting implications for economic growth
  - ▶ Globalization $\Rightarrow$ education?

Changes in exports and high school completion in Chinese prefectures from 200o to 2005
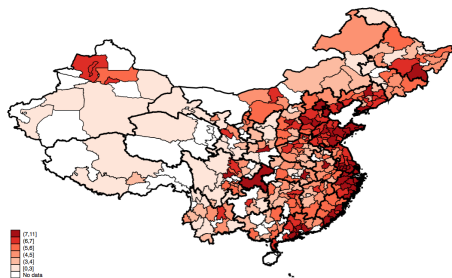

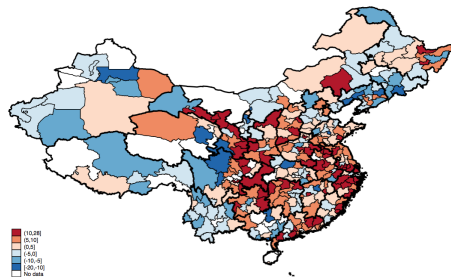Figure: *Increased Export Value from 2000 to 2005*

Figure: *Changes from 2000 to 2005 in High School Educated (%) among 18-27 Year-old Natives*

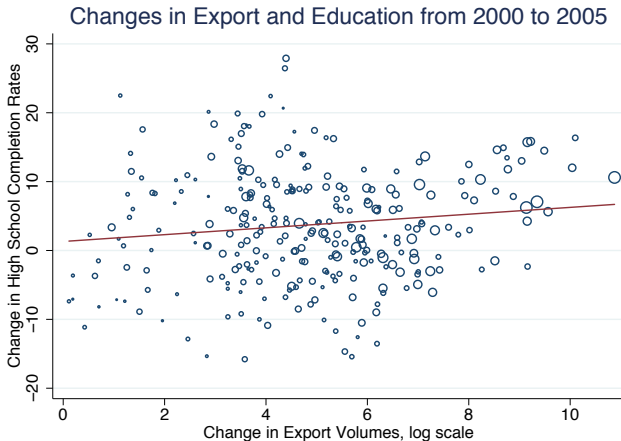# Did globalization alter educational attainment in China?

Figure: *Scatterplot of Export and Education Level Increases from 2000 to 2005*

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  - ▶ Which trade policy changes encourage education, and which ones suppress education?

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- ▶ Approach:
  - ▶ Local labor market exposure: Bartik (1991); Topalova (2007; 2010); Autor et al. (2013); Pierce and Schott (2016)
  - ▶ Trade policy changes affecting 15 cohorts from 1990 to 2004 in 324 Chinese prefectures
  - ▶ Variation in timing and degree of exposure to declining trade barriers
  - ▶ Difference-in-differences

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- ▶ Findings:
  - ▶ Trade policy changes ⇒ skill premium ⇒ education
  - ▶ From 1990 to 2004, trade explains half of the increases in high school completion rate in the average Chinese prefecture.

Local Labor Market Outcomes:

- ▶ Bartik (1991)
- ▶ Trade: Topalova (2007; 2010); Autor et al. (2013); Kovak (2013)

Trade liberalization and increased skill premium:

- ▶ Mexico: Feenstra and Hanson (1996; 1997); Revenga (1997); Hanson and Harrison (1999)
- ▶ Brazil: Bustos (2011); Kovak (2013)
- ▶ India: Deaton and Dreze (2002); Topalova (2004; 2005)
- ▶ Colombia: Attanasio, Goldberg and Pacvnik (2004)

Globalization and education:

- ▶ Child labor: Basu (1999); Ranjan (2001)
- ▶ Vietnam: Edmonds and Pacvnik (2005)
- ▶ India: Edmonds et al. (2009; 2010)
- ▶ Mexico: Atkin (2016)

Globalization and China:

- ▶ Wage inequality: Ge and Yang (2014); Sheng and Yang (WP); Li et al. (WP)
- ▶ Traded inputs: Kee and Tang (2015); Brandt and Morrow (WP)
- ▶ U.S. and China: Autor et al. (2013); Pierce and Schott (2016)

Data Sources

Use	Data Source	Availability
Education, Migration	Chinese Census	2000; 2005
Other Prefecture Characteristics	Chinese City Statistical Yearbooks	1990-2005
Imports and Exports	China Custom Data	1997-1999
Sectoral Employment	Chinese Annual Survey of Industrial Firms	1998-2000
Skill Intensity	Chinese Annual Survey of Industrial Firms	2004
Tariff Rates	WITS-TRAINS	1989-2004
NTR Gaps	Pierce and Schott (2016)	1999

Trade Policy Changes Affecting China

- PNTR & WTO
- Uruguay Round
- CN Tariff Decline

Level of Chinese impor tariffs (%) vs Year (1987–2004)
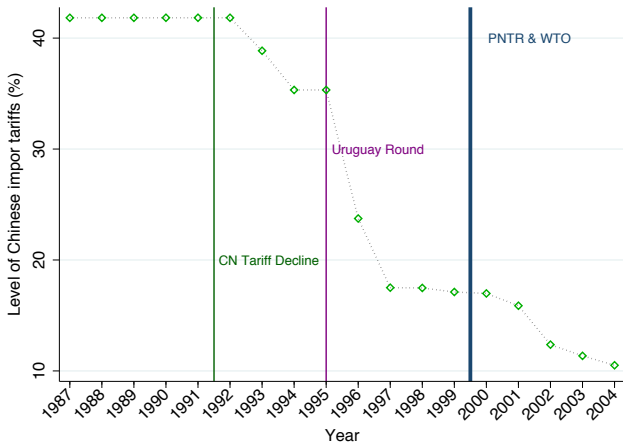
Aggregated Prefecture Level Trade Barriers
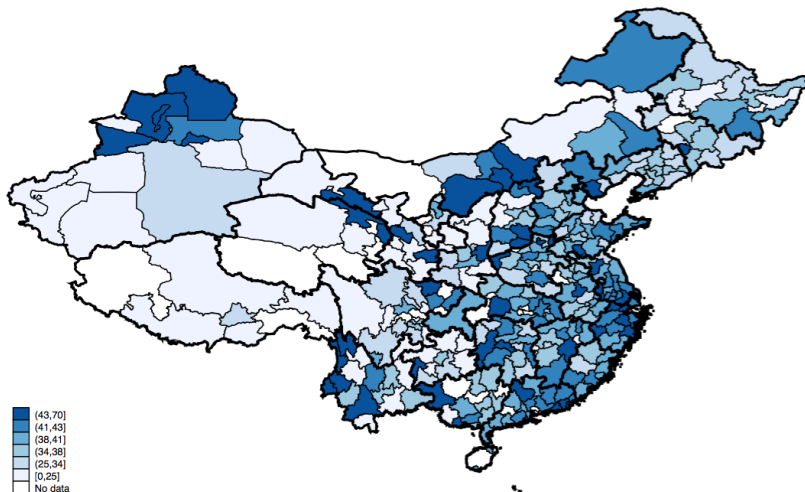
Figure: *Changes in Chinese tariff rates on unskilled goods*

Aggregated Prefecture Level Trade Barriers

Legend:
- (23,55]
- (21,23]
- (18,21]
- (15,18]
- (12,15]
- [0,12]
- No data

Figure: *Changes in Chinese tariff rates on capital goods*
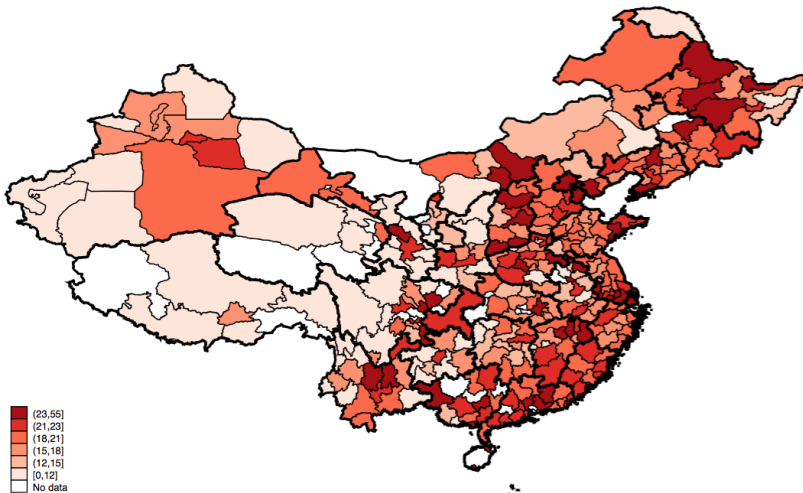
▶ Local trade policy changes

Spatial Variation in Education

Figure: *Changes from 2000 to 2005 in High School Educated (%) among 18-27 Year-old Natives*

Legend:
- (10,28]
- (5,10]
- (0,5]
- (-5,0]
- (-10,-5]
- [-20,-10]
- No data

DID Estimation: High School Education

How do changes in educational attainment overtime differ in prefectures *more exposed* to trade shocks relative to prefectures *less exposed* to trade shocks?

$$\overline{E_{jt}} = \beta_1 \mathbf{tariff}_{jt}^{CHN} + \beta_2 \mathbf{tariff}_{jt}^{ROW} + \beta_3 \text{Post WTO}_t \cdot \mathbf{NTR}_j$$
$$+ \gamma \mathbf{X}_{jt} + \delta \cdot D_j * \tau_t + \tau_t + \lambda_j + \epsilon_{jt}$$

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HIGH SCHOOL	Import tariffs			Tariffs abroad		NTR gaps	
	tariff_{Tech}	tariff_{CHN}^{H}	tariff_{CHN}^{L}	tariff_{ROW}^{H}	tariff_{ROW}^{L}	NTR^{H}	NTR^{L}

▸ Regression Table   ▸ Local trade policy changes

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	tariff_{Tech}	tariff_{CHN}^{H}	tariff_{CHN}^{L}	tariff_{ROW}^{H}	tariff_{ROW}^{L}	NTR^{H}	NTR^{L}
SS Theory Prediction							
Relative demand for $\overline{E}$	↑	↓	↑	↑	↓	↑	↓

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	tariff_{Tech}	tariff_{CHN}^H	tariff_{CHN}^L	tariff_{ROW}^H	tariff_{ROW}^L	NTR^H	NTR^L
SS Theory Prediction							
Relative demand for $\overline{E}$	↑	↓	↑	↑	↓	↑	↓
$\beta = \partial\overline{E}/\partial\tau$	< 0	> 0	< 0	< 0	> 0	> 0	< 0

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HIGH SCHOOL	Import tariffs			Tariffs abroad		NTR gaps	
	tariff_{Tech}	tariff_{CHN}^{H}	tariff_{CHN}^{L}	tariff_{ROW}^{H}	tariff_{ROW}^{L}	NTR^{H}	NTR^{L}
SS Theory Prediction							
Relative demand for $\overline{E}$	↑	↓	↑	↑	↓	↑	↓
$\beta = \partial \overline{E}/\partial \tau$	< 0	> 0	< 0	< 0	> 0	> 0	< 0
Estimated Effect							
$\hat{\beta}$	-0.478	-0.148	-0.170	-0.093	0.151	-0.001	-0.109
	(0.202)**	(0.120)	(0.075)**	(0.073)	(0.091)*	(0.056)	(0.046)**

R^2	0.81
N	4,860
SE	Clustered at prefecture level
Other Controls	Contract Intensity; MFA Quota Bound; Skill Content of Immigrants
Pref FE; Cohort FE	Yes
Pref x cohort trend	Yes
Sample	Native Males: Non-migrants plus out-migrants

▸ Regression Table   ▸ Local trade policy changes

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	tariff_{Tech}	tariff_{CHN}^H	tariff_{CHN}^L	tariff_{ROW}^H	tariff_{ROW}^L	NTR^H	NTR^L
SS Theory Prediction							
Relative demand for $\overline{E}$	↑	↓	↑	↑	↓	↑	↓
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Pref FE; Cohort FE	Yes						
Pref x cohort trend	Yes						
Sample	Native Males: Non-migrants plus out-migrants						
Education	**E ⇑**	*E ↓*	**E ⇑**	*E ↑*	**E ⇓**	*E ↑*	**E ⇓**

▸ Regression Table   ▸ Local trade policy changes

Robustness Checks

- Migration response ▶ Internal Migration
- Prefectures with immigrants ▶ High School   ▶ College
- Alternative definitions of native population ▶ High School   ▶ College
- Employment Weights ▶ High School   ▶ College
- Granger Test ▶ Older Cohorts
- Placebo Test ▶ Middle School
- Semi-parametric evidence ▶ Results

DID Estimation: College Education

How do changes in educational attainment overtime differ in prefectures *more exposed* to trade shocks relative to prefectures *less exposed* to trade shocks?

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COLLEGE	Import tariffs			Tariffs abroad		NTR gaps	
	tariff_{Tech}	tariff_{CHN}^H	tariff_{CHN}^L	tariff_{ROW}^H	tariff_{ROW}^L	NTR^H	NTR^L
SS Theory Prediction							
Relative demand for $\overline{E}$	↑	↓	↑	↑	↓	↑	↓
$\beta = \partial \overline{E}/\partial \tau$	< 0	> 0	< 0	< 0	> 0	> 0	< 0
Estimated Effect							
$\hat{\beta}$	0.045	-0.110	-0.065	0.070	-0.011	-0.007	0.016
	(0.222)	(0.071)	(0.047)	(0.074)	(0.056)	(0.029)	(0.023)
R^2	0.73						
N	4,860						
SE	Clustered at prefecture level						
Other Controls	Contract Intensity; MFA Quota Bound; Skill Content of Immigrants						
Pref FE; Cohort FE	Yes						
Pref x cohort trend	Yes						
Sample	Non migrants plus emigrants						
Education	$E \uparrow$	$E \downarrow$	$E \uparrow$	$E \uparrow$	$E \downarrow$	$E \uparrow$	$E \downarrow$

▶ Regression Table

Three channels through which trade affects educational attainment

1. Return to education/skill premium
   - Stolper-Samuelson effects
   - Production sharing/outsourcing
   - Trade-induced capital accumulation and STBC
   - ▶ Skill premium

2. Opportunity cost of education:
   - Arrival of low-skill manufacturing jobs
   - ▶ Unskilled Manufacturing jobs

3. Supply of education resources
   - Increased public provision of *High School* education at the local level
   - College education remains centrally funded; admission policies skew incentive
   - ▶ Teaching resources

1. Returns to Education: Average Wage by Skill Intensity and Firm Type
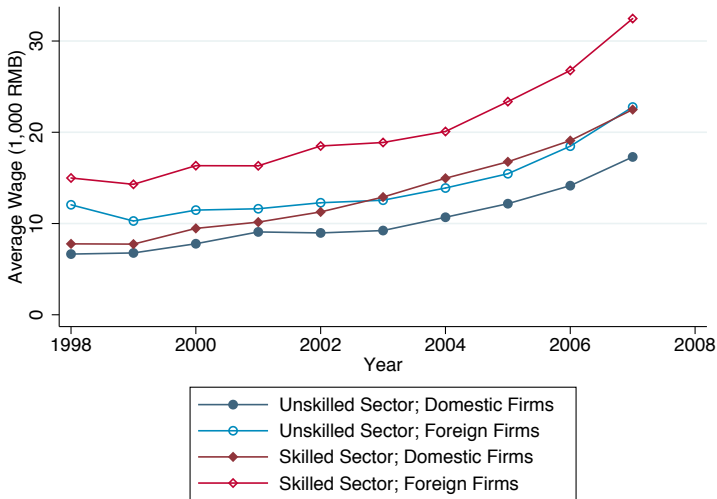
Figure: *Average wage in skilled and unskilled sectors*

2. Opportunity Cost: Increase in Low-skill Manufacturing Employment
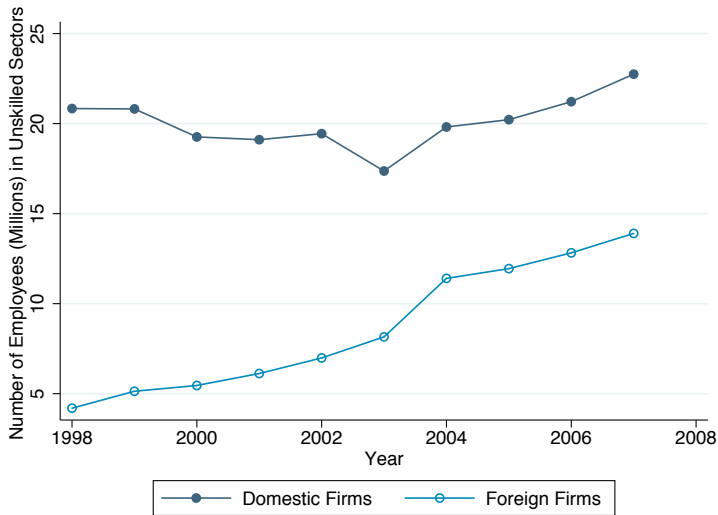
Figure: *Level of Employment in Unskilled Sectors*

2. Opportunity Cost: PNTR and Growth in Unskilled Jobs

	Unskilled Industries			Skilled Industries
	All firms	Chinese Firms	Foreign Firms	All Firms
NTR Gap	0.872	0.584	0.303	-0.023
	(0.312)***	(0.239)**	(0.141)**	(0.331)
R^2	0.85	0.83	0.86	0.68
N	2,081	2,018	1,960	2,128
Other Controls	Yes	Yes	Yes	Yes
Industry FE; Year FE	Yes	Yes	Yes	Yes

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table: *Estimated effect of PNTR on low-skill job growth*

3. Supply of Education: Expansion in Public Education
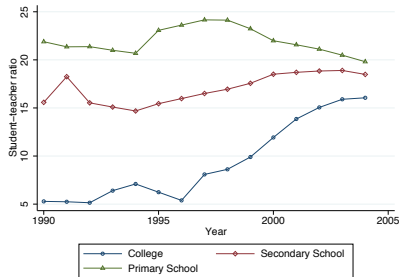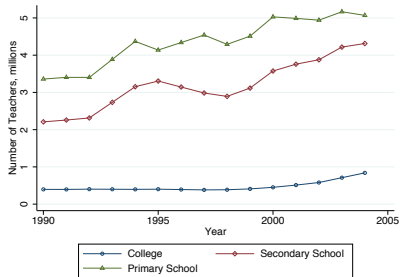
- Internal migration *not* sufficient to adjust for increased demand for skill
- In the average prefecture, high school and college completion doubled between 1990 and 2005
- Opposing educational impacts from different trade policy changes

	Import tariffs			Tariffs abroad		NTR gaps	
	tariff_{Tech}	tariff^H_{CHN}	tariff^L_{CHN}	tariff^H_{ROW}	tariff^L_{ROW}	ΔNTR^H	ΔNTR^L
Skill Premium	↑	↓	↑	↑	↓	↑	↓
Education	**E ⇑**	$E\downarrow$	**E ⇑**	$E\uparrow$	**E ⇓**	$E\uparrow$	**E ⇓**

Future Work:

- ▶ Directly assess skill and schooling premia
- ▶ Political economy of local public education provision
- ▶ Economic growth and inequality in education

Appendix: Diff-in-diff plot for High School

How do changes in educational attainment overtime differ in prefectures *more exposed* to trade shocks relative to prefectures *less exposed* to trade shocks?

Age Cohorts

Small decline in trade barriers   Large decline in trade barriers

‣ Back
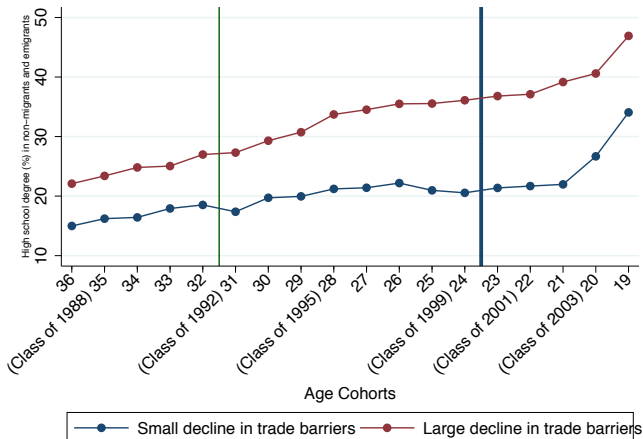
Distinguishing high- and low- skill content of industries, by share of educated worked employed in each industry:

- ▶ Skilled labor intensive goods: H
- ▶ Unskilled labor intensive goods: L

Dividing trade shocks into import and export shocks export :

- ▶ Import shocks:
  - ▶ Chinese import tariff rates on capital goods: $\text{tariff}_{CHN}^{Tech}$:
  - ▶ Chinese import tariff rates: tariff_{CHN}^{L}, tariff_{CHN}^{H}
- ▶ Export shocks:
  - ▶ Tariff rates abroad (MFN rates): tariff_{ROW}^{L}, tariff_{ROW}^{H}
  - ▶ Tariff uncertainty with the U.S.: NTR^{L}, NTR^{H}
    - ▶ Handley and Limao (2013); Pierce and Schott (2016)
    - ▶ NTR gap$_i$ = non NTR rate$_i$ − NTR rate$_i$.

Appendix: Aggregated Prefecture Level Trade Barriers

i: product; j: prefecture; t: year/cohort
Sectoral Employment Weights, fixed at 1998-2000:

$$w_{ij} = \mathsf{Emp}_{ij} / \sum_i \mathsf{Emp}_{ij}$$

Trade Basket Weights, fixed at 1997-1999:

$$w_{ij} = \mathsf{XM}_{ij} / \sum_i \mathsf{XM}_{ij}$$

Weighted prefecture-specific **trade policy** each prefecture j faces at year t:

$$\mathsf{Trade\ Policy}_{jt} = \sum_i w_{ij} \cdot \mathsf{Trade\ Policy}_{it}$$

Table: **High School** Completion of Native (non-migrant plus emigrants) Male Labor Force

	All prefectures				Prefectures with immigrants		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
tariff$^L_{CHN-O}$	-0.233 (0.084)***	-0.185 (0.078)**		-0.170 (0.075)**	-0.235 (0.107)**		-0.237 (0.094)**
tariff$^H_{CHN-O}$	-0.218 (0.152)	-0.163 (0.133)		-0.148 (0.120)	-0.118 (0.194)		-0.095 (0.177)
tariff$^L_{ROW}$	0.153 (0.088)*	0.144 (0.092)		0.151 (0.091)*	0.159 (0.100)		0.161 (0.097)*
tariff$^H_{ROW}$	-0.113 (0.074)	-0.092 (0.070)		-0.093 (0.073)	0.003 (0.060)		0.004 (0.069)
tariff$_{CHN-Tech}$		-0.548 (0.211)***		-0.478 (0.202)**	-0.676 (0.295)**		-0.620 (0.281)**
Post WTO * NTR^L			-0.120 (0.046)**	-0.109 (0.046)**		-0.152 (0.061)**	-0.131 (0.058)**
Post WTO * NTR^H			-0.033 (0.055)	-0.001 (0.056)		-0.022 (0.066)	0.025 (0.061)
Skilled Migration Share				0.016 (0.005)***			0.020 (0.006)***
R^2	0.81	0.81	0.81	0.81	0.84	0.84	0.84
N	4,860	4,860	4,860	4,860	3,390	3,390	3,390
Other Controls	No	No	No	Yes	No	No	Yes
Pref FE; Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pref x cohort trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes

$^*\ p < 0.1;\ ^{**}\ p < 0.05;\ ^{***}\ p < 0.01$

Table: **College** *Completion of Native Male Labor Force*

	NM+EM	NM+EM	NM+EM	NM	NM+IM	NM+IM (isic)	NM+IM (cic)
tariff$_{CHN}^{L}$	-0.061		-0.065	-0.074	-0.074	-0.048	-0.034
	(0.046)		(0.047)	(0.048)	(0.044)*	(0.053)	(0.043)
tariff$_{CHN}^{H}$	-0.111		-0.110	-0.108	-0.109	0.093	0.010
	(0.070)		(0.071)	(0.070)	(0.064)*	(0.049)*	(0.046)
tariff$_{ROW}^{L}$	-0.010		-0.011	-0.014	-0.015	-0.006	0.006
	(0.056)		(0.056)	(0.058)	(0.049)	(0.023)	(0.018)
tariff$_{ROW}^{H}$	0.071		0.070	0.067	0.097	0.004	-0.013
	(0.073)		(0.074)	(0.075)	(0.072)	(0.027)	(0.028)
tariff$_{CHN-Tech}$	0.060		0.045	0.036	-0.013		
	(0.110)		(0.111)	(0.110)	(0.106)		
Post WTO $*$ NTR^{L}		0.017	0.016	0.016	0.025	-0.037	-0.044
		(0.024)	(0.023)	(0.023)	(0.023)	(0.044)	(0.039)
Post WTO $*$ NTR^{H}		-0.012	-0.007	-0.006	0.006	0.091	0.106
		(0.030)	(0.029)	(0.029)	(0.030)	(0.071)	(0.060)*
R^2	0.73	0.73	0.73	0.73	0.74	0.85	0.85
N	4,859	4,859	4,859	4,859	4,859	5,085	5,085
Other Controls	No	No	Yes	Yes	Yes	No	No
Pref FE; Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pref x cohort trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table: *Internal migration in China (employed workers), 2000*

	Temporary Migration		Permanent Migration	
Males	Skilled	Unskilled	Skilled	Unskilled
Flow (in millions)	6.07	21.46	3.08	2.18
Share (%)	8.6	7.6	4.4	0.7
Females	Skilled	Unskilled	Skilled	Unskilled
Flow (in millions)	5.02	24.24	3.59	5.36
Share (%)	8.6	7.6	7.8	2.0

Notes: Based on authors calculation using Chinese Census 2000. The sample uses 16-65 year-old employed workers in China during 2000.

Appendix: Trade and Migration

	Migration		Native Working Hours	
	Unskilled	Skilled	Unskilled	Skilled
NTR Gap	0.032	0.093	0.56	-0.000
	(0.019)*	(0.032)**	(0.015)***	(0.012)
R^2	0.96	0.88	0.72	0.73
N	666	666	666	666
Other Controls	Yes	Yes	Yes	Yes
Prefecture FE; Year FE	Yes	Yes	Yes	Yes

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table: *Increase in Labor Demand in Chinese Prefectures, 2000–2005*

Table: *Robustness Checks: **High School** Completion of local labor force (male plus female), with sectoral employment weights*

	ISIC Rev3		CIC 2002	
	(1)	(2)	(3)	(4)
tariff$_{CHN}^{L}$	-0.316	-0.331	-0.241	-0.247
	(0.125)**	(0.121)***	(0.098)**	(0.095)**
tariff$_{CHN}^{H}$	0.181	0.204	-0.011	-0.000
	(0.098)*	(0.093)**	(0.073)	(0.073)
tariff$_{ROW}^{L}$	0.519	0.458	0.145	0.120
	(0.307)*	(0.305)	(0.068)**	(0.065)*
tariff$_{ROW}^{H}$	0.173	0.169	0.116	0.115
	(0.033)***	(0.033)***	(0.025)***	(0.026)***
Post WTO $*$ NTR^{L}	-0.433	-0.414	-0.265	-0.252
	(0.091)***	(0.089)***	(0.077)***	(0.077)***
Post WTO $*$ NTR^{H}	-0.111	-0.123	-0.166	-0.175
	(0.152)	(0.153)	(0.119)	(0.119)
Skilled Migration Share		0.057		0.056
		(0.005)***		(0.005)***
R^2	0.87	0.88	0.87	0.88
N	5,085	5,085	5,085	5,085
Other Controls	No	Yes	No	Yes
Pref FE; Cohort FE	Yes	Yes	Yes	Yes
Pref x cohort trend	Yes	Yes	Yes	Yes

$^*\ p < 0.1;\ ^{**}\ p < 0.05;\ ^{***}\ p < 0.01$

Table: *Placebo Test: **Junior High School** completion*

	All prefectures				Prefectures with immigrants		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
tariff^L_{CHN-O}	0.007	0.008		0.017	-0.034		-0.012
	(0.070)	(0.076)		(0.076)	(0.103)		(0.106)
tariff^H_{CHN-O}	-0.131	-0.131		-0.129	-0.107		-0.094
	(0.149)	(0.143)		(0.141)	(0.278)		(0.283)
tariff^L_{ROW}	0.051	0.051		0.057	0.015		0.020
	(0.110)	(0.110)		(0.110)	(0.155)		(0.156)
tariff^H_{ROW}	-0.247	-0.247		-0.242	-0.263		-0.261
	(0.145)*	(0.144)*		(0.146)*	(0.159)*		(0.154)*
$\text{tariff}_{CHN-Tech}$		-0.002		0.012	-0.001		-0.008
		(0.205)		(0.207)	(0.268)		(0.273)
Post WTO $*$ NTR^L			0.026	0.019		0.024	0.013
			(0.042)	(0.042)		(0.058)	(0.058)
Post WTO $*$ NTR^H			-0.056	-0.054		-0.071	-0.056
			(0.053)	(0.052)		(0.080)	(0.081)
Skilled Migration Share				0.002			0.006
				(0.003)			(0.008)
R^2	0.87	0.87	0.87	0.87	0.90	0.89	0.90
N	4,799	4,799	4,799	4,799	3,116	3,116	3,116
Other Controls	No	No	No	Yes	No	No	Yes
Pref FE; Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pref x cohort trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Appendix: Granger Test

Table: *Granger Test: **High School** completion of older cohorts (Class of 1980 - Class of 1994)*

	All prefectures				Prefectures with immigrants		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
tariff$_{CHN-O}^{L}$	0.014	0.025		0.020	0.042		0.038
	(0.048)	(0.050)		(0.051)	(0.064)		(0.063)
tariff$_{CHN-O}^{H}$	0.038	0.052		0.041	-0.005		-0.021
	(0.095)	(0.092)		(0.090)	(0.116)		(0.115)
tariff$_{ROW}^{L}$	0.039	0.037		0.038	0.029		0.031
	(0.089)	(0.089)		(0.089)	(0.092)		(0.094)
tariff$_{ROW}^{H}$	-0.093	-0.090		-0.083	-0.120		-0.114
	(0.084)	(0.085)		(0.088)	(0.086)		(0.088)
tariff$_{CHN-Tech}$		-0.118		-0.130	0.030		0.031
		(0.147)		(0.146)	(0.184)		(0.182)
Post WTO $*$ NTR^{L}			0.049	0.052		0.039	0.037
			(0.041)	(0.043)		(0.054)	(0.056)
Post WTO $*$ NTR^{H}			-0.019	-0.014		-0.010	-0.006
			(0.045)	(0.046)		(0.062)	(0.063)
Skilled Migration Share				0.003			0.007
				(0.004)			(0.004)
R^2	0.79	0.79	0.79	0.79	0.82	0.81	0.82
N	4,212	4,212	4,212	4,212	3,352	3,352	3,352
Other Controls	No	No	No	Yes	No	No	Yes
Pref FE; Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pref x cohort trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Appendix: Robustness Check

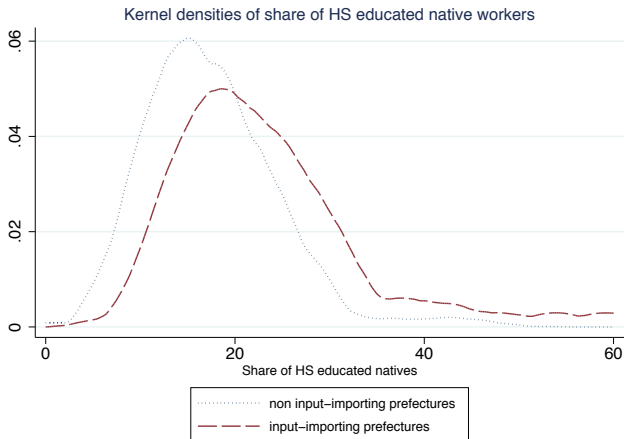Table: *Robustness Checks: **High School** Completion of Labor Force*

	NM + IM (1)	NM + EM (2)	NM (3)	female NM + IM (4)	female NM + EM (5)
tariff^L_{CHN-O}	-0.195	-0.176	-0.183	-0.115	-0.077
	(0.068)***	(0.074)**	(0.073)**	(0.079)	(0.075)
tariff^H_{CHN-O}	-0.239	-0.151	-0.185	-0.172	-0.120
	(0.124)*	(0.122)	(0.115)	(0.123)	(0.113)
tariff^L_{ROW}	0.117	0.154	0.158	-0.209	-0.157
	(0.097)	(0.091)*	(0.092)*	(0.065)***	(0.061)**
tariff^H_{ROW}	-0.106	-0.096	-0.095	0.047	0.053
	(0.080)	(0.072)	(0.072)	(0.114)	(0.097)
$\text{tariff}_{CHN-Tech}$	-0.789	-0.467	-0.460	-0.526	-0.337
	(0.267)***	(0.200)**	(0.202)**	(0.226)**	(0.201)*
Post WTO $*$ NTR^L	-0.125	-0.110	-0.109	-0.060	-0.015
	(0.051)**	(0.045)**	(0.047)**	(0.045)	(0.044)
Post WTO $*$ NTR^H	-0.047	-0.003	-0.032	-0.060	-0.046
	(0.056)	(0.056)	(0.056)	(0.055)	(0.054)
R^2	0.80	0.81	0.81	0.78	0.82
N	4,856	4,856	4,856	4,855	4,855
Other Controls	Yes	Yes	Yes	Yes	Yes
Pref FE; Cohort FE	Yes	Yes	Yes	Yes	Yes
Pref x cohort trend	Yes	Yes	Yes	Yes	Yes

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

- DiNardo, Fortin and Lemieux (1996)
- Pavcnik (2003) for skill upgrading in Columbia
- Chiquiar and Hanson (2005) for income selection of Mexican immigrants in the U.S.

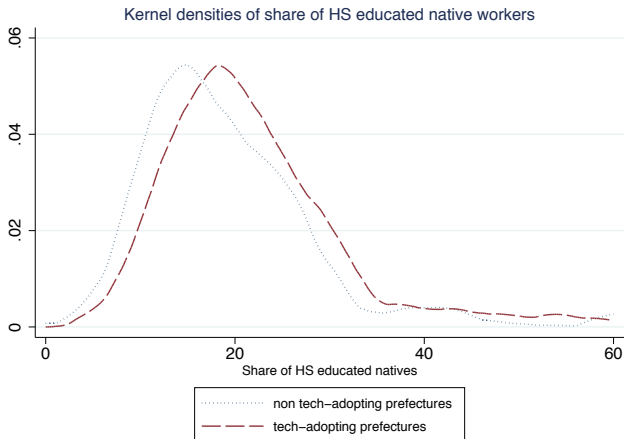# Appendix: Imports of Intermediate Goods

Kernel densities of share of HS educated native workers

Appendix: Imports of Intermediate Goods

Kernel densities of share of HS educated native workers

Legend:
- non input–importing prefectures
- input–importing prefectures
- Counterfactual (reweighted) density

X-axis: Share of HS educated natives

▶ Back to Robustness Checks

Kernel densities of share of HS educated native workers
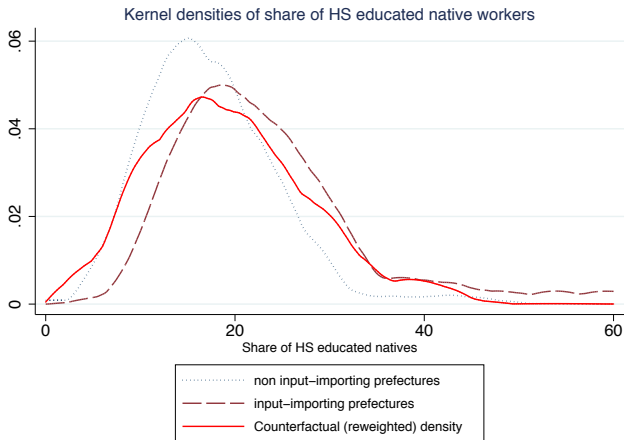
Appendix: Foreign Technology Adoption

Kernel densities of share of HS educated native workers

Legend:
- non tech–adopting prefectures
- tech–adopting prefectures
- Counterfactual (reweighted) density of tech–adpoting prefectures

▸ Back to Robustness Checks