

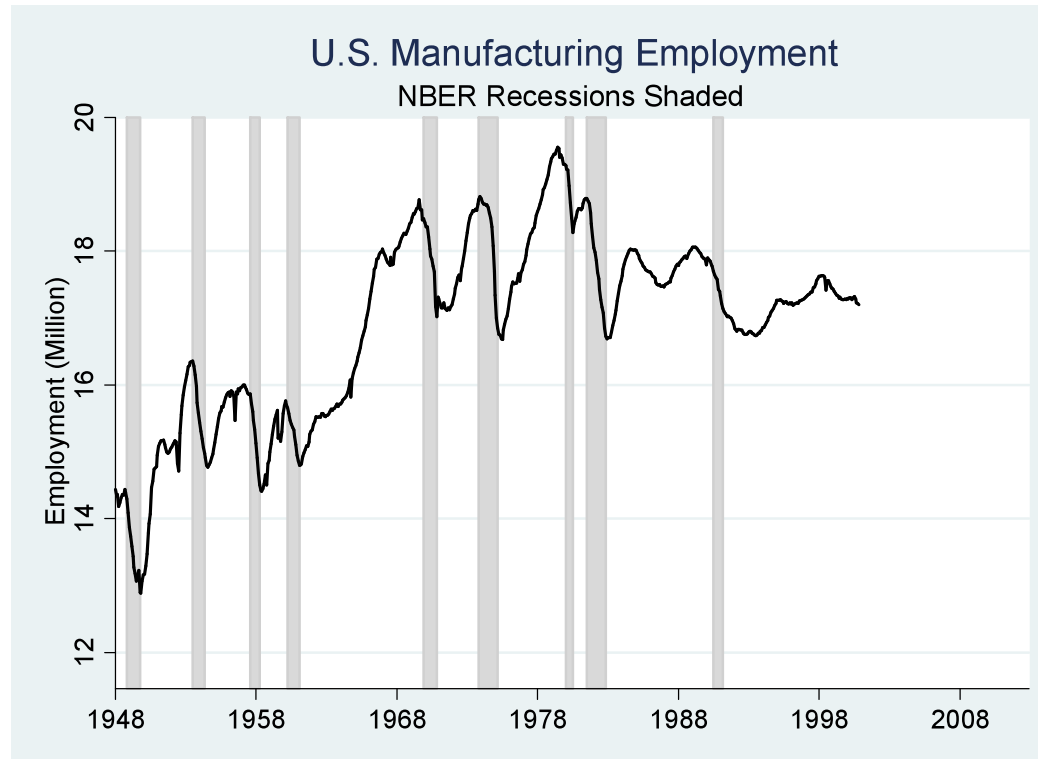
The Surprisingly Swift Decline of U.S. Manufacturing Employment

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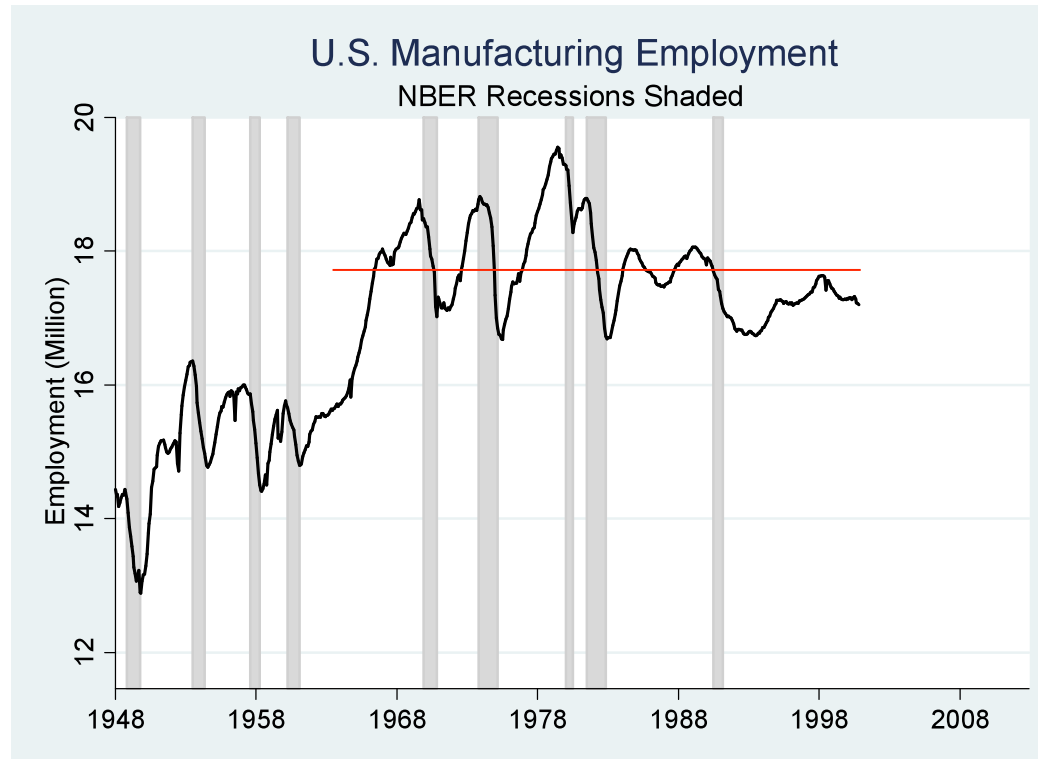
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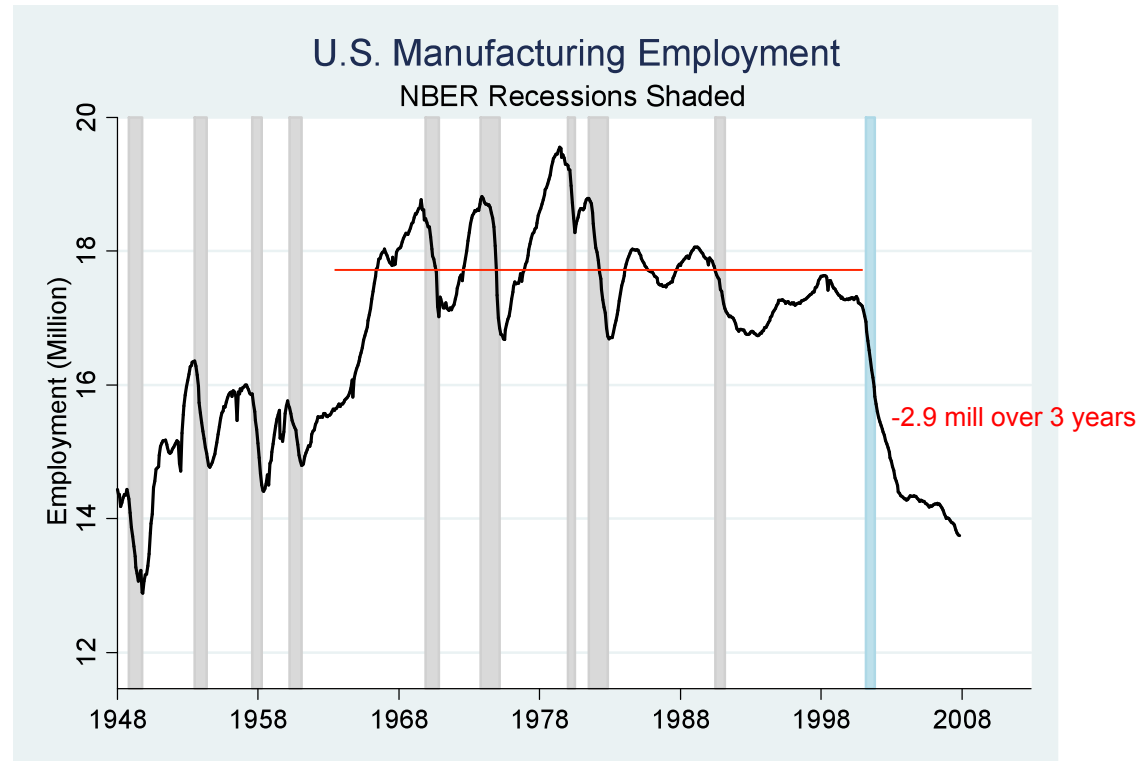
Post-War U.S. Manufacturing Employment



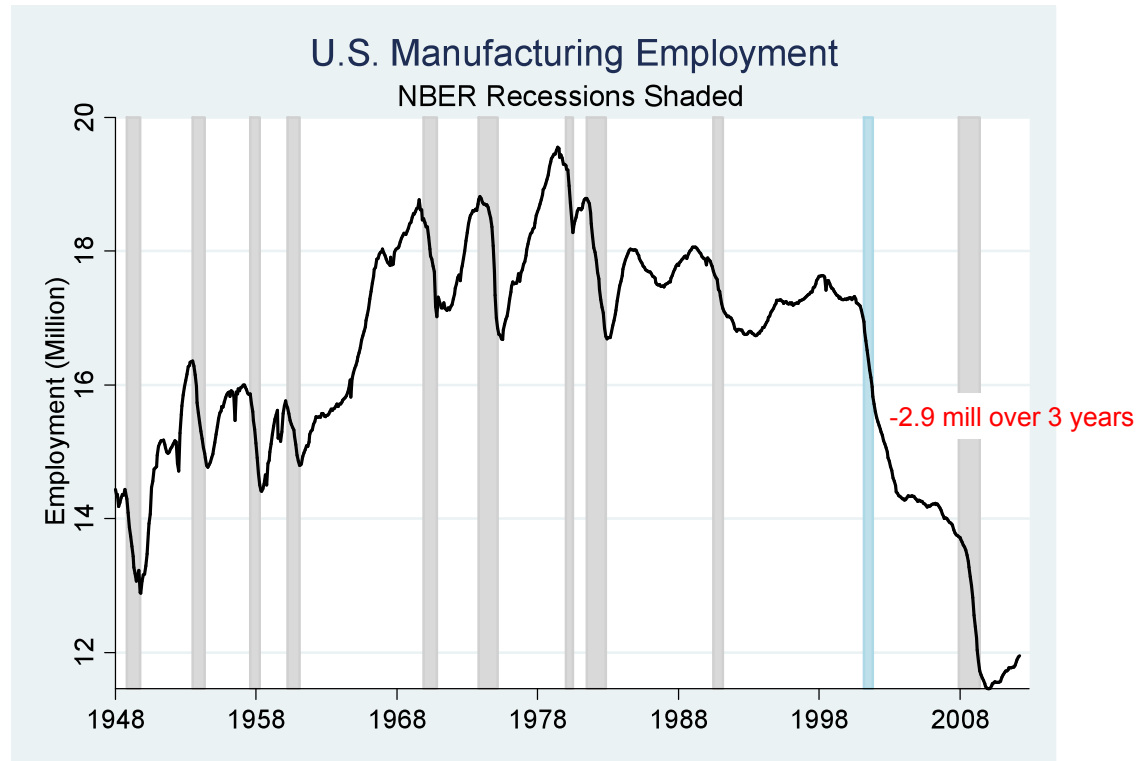
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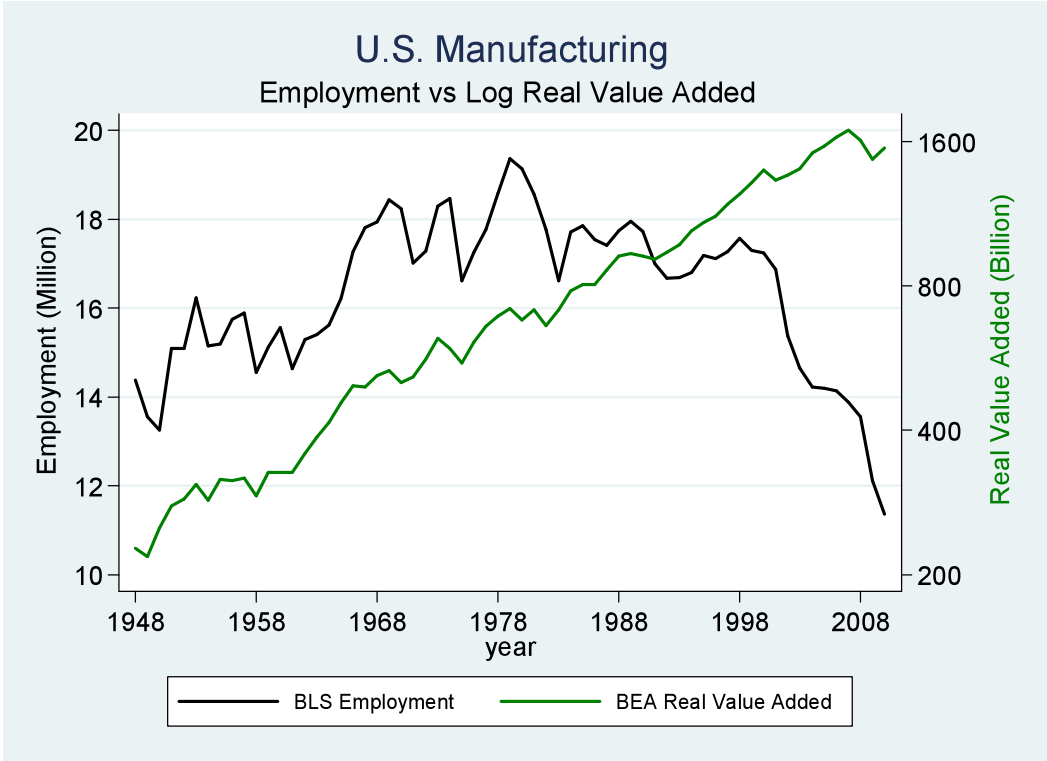
Post-War U.S. Manufacturing Employment



Introduction

- The sharp decline in US manufacturing employment is closely linked to a change in U.S. trade policy granting China **Permanent Normal Trade Relations (PNTR)** status
- **PNTR** did not change actual tariff rates
 - They were already at the low levels offered WTO member
 - But this status required annual approval by Congress
- The possibility of large tariff increases before PNTR likely discouraged
 - US firms from offshoring
 - Chinese firms from expanding

Before Continuing...



While US employment falls after 2001, real value added continues to rise at more-or-less the historical pace

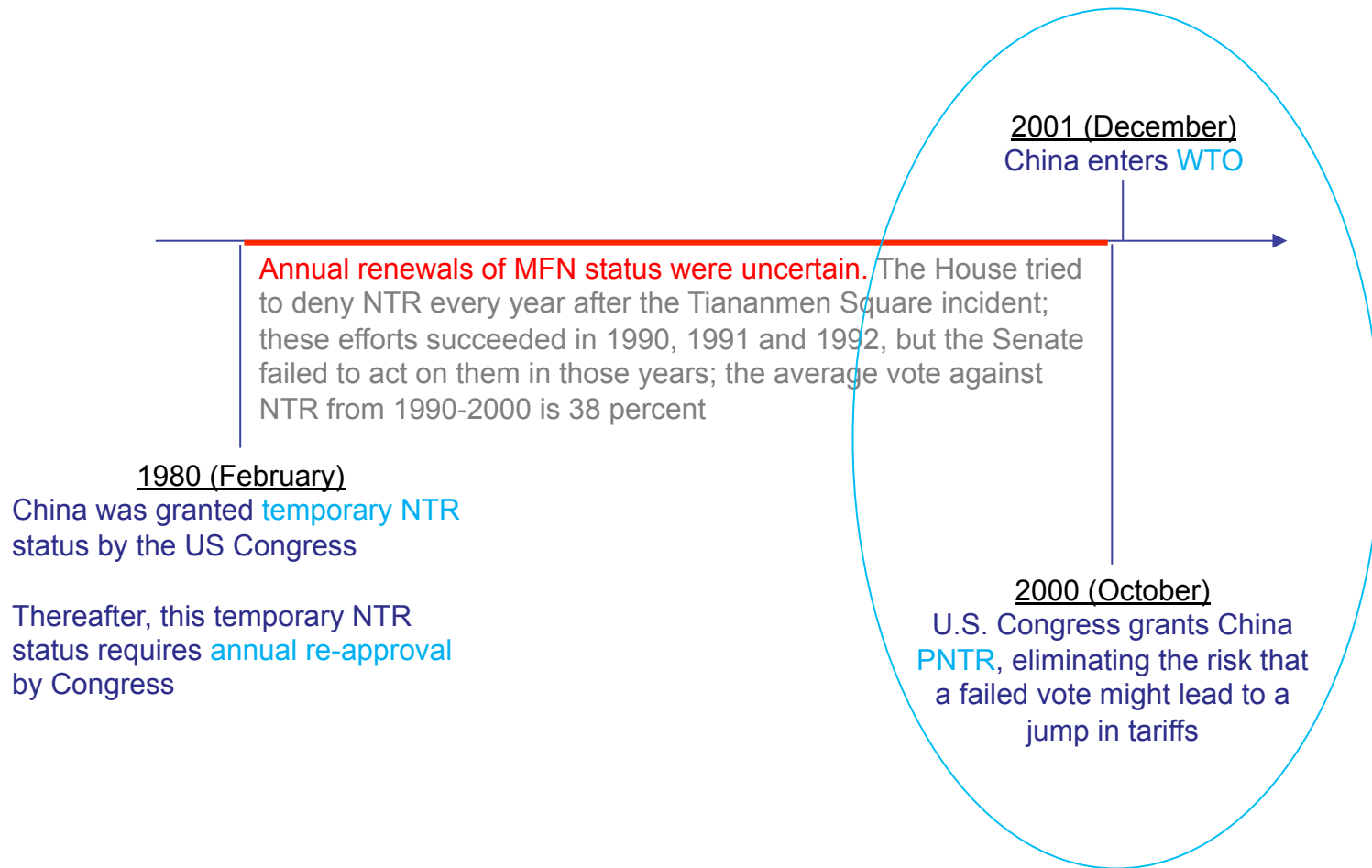
Outline

- US-China Trade Policy
- Data
- Baseline results
- Extended results
- Other outcomes
- Conclusion

US NTR and Non-NTR Tariffs

- **NTR** = Normal Trade Relations
 - Synonym for Most Favored Nation (MFN)
 - Clinton?
- The US has two basic tariff schedules
 - **NTR tariffs** : generally low; for WTO members
 - **Non-NTR tariffs** : generally high; for non-market economies;
: set by Smoot-Hawley (1930)
- So, how does China fit into these categories?

US-China Trade Policy, 1980-2001



Measuring the Policy Change

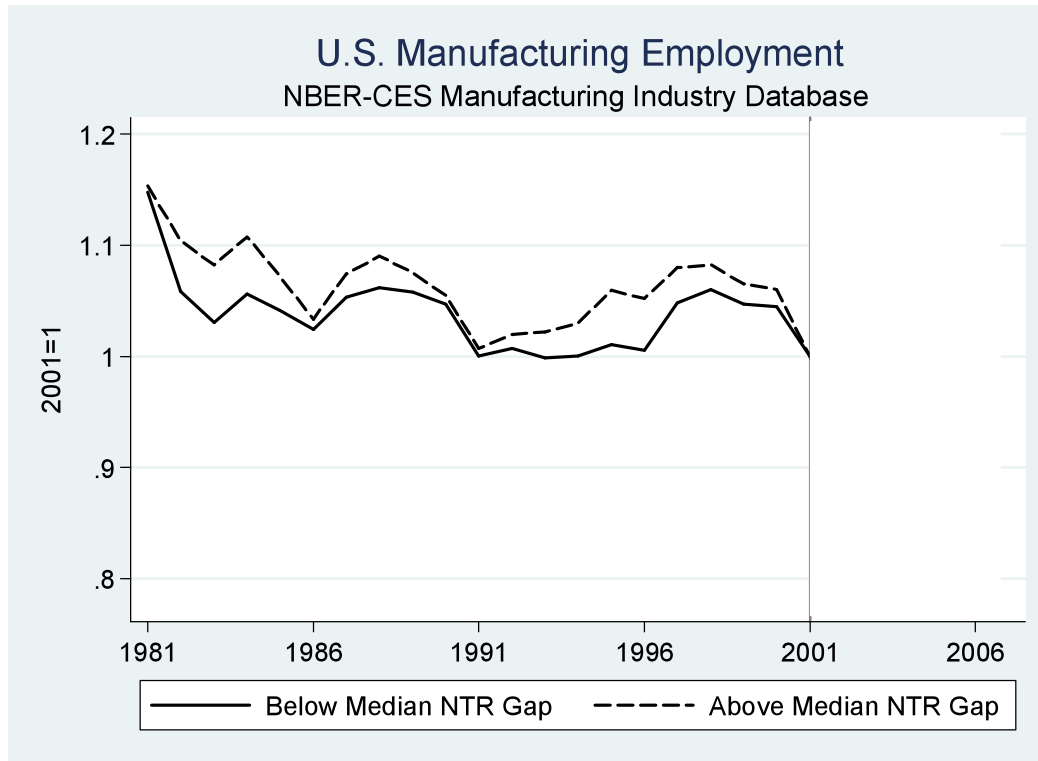
- We define a measure of the effect of the policy as:

$$\text{NTR Gap} = \text{Non-NTR Tariff} - \text{NTR Tariff}$$

- Two useful attributes
 - Measures extent to which tariffs could increase prior to PNTR
 - Varies across industries
- We can preview the results in two simple pictures that divide US industries according to whether their NTR gaps are above or below the median

Preview of Findings – Employment

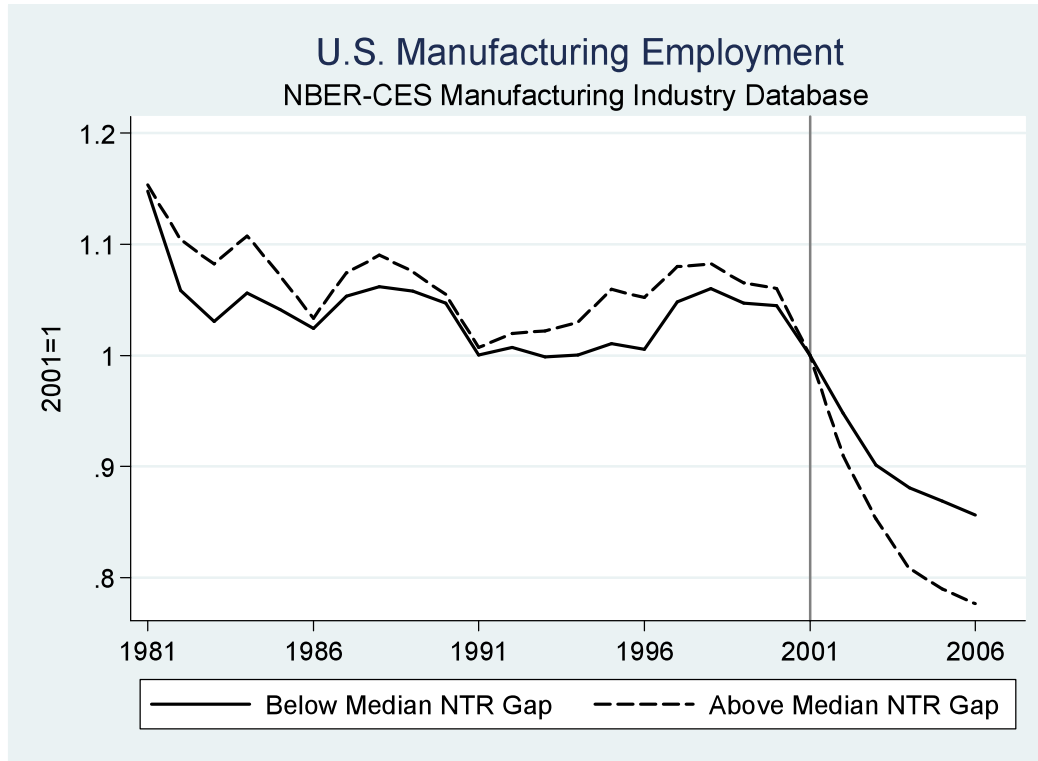
Public NBER-CES Data



- Split industries into two groups
 - Above median exposure
 - Below median exposure

Preview of Findings – Employment

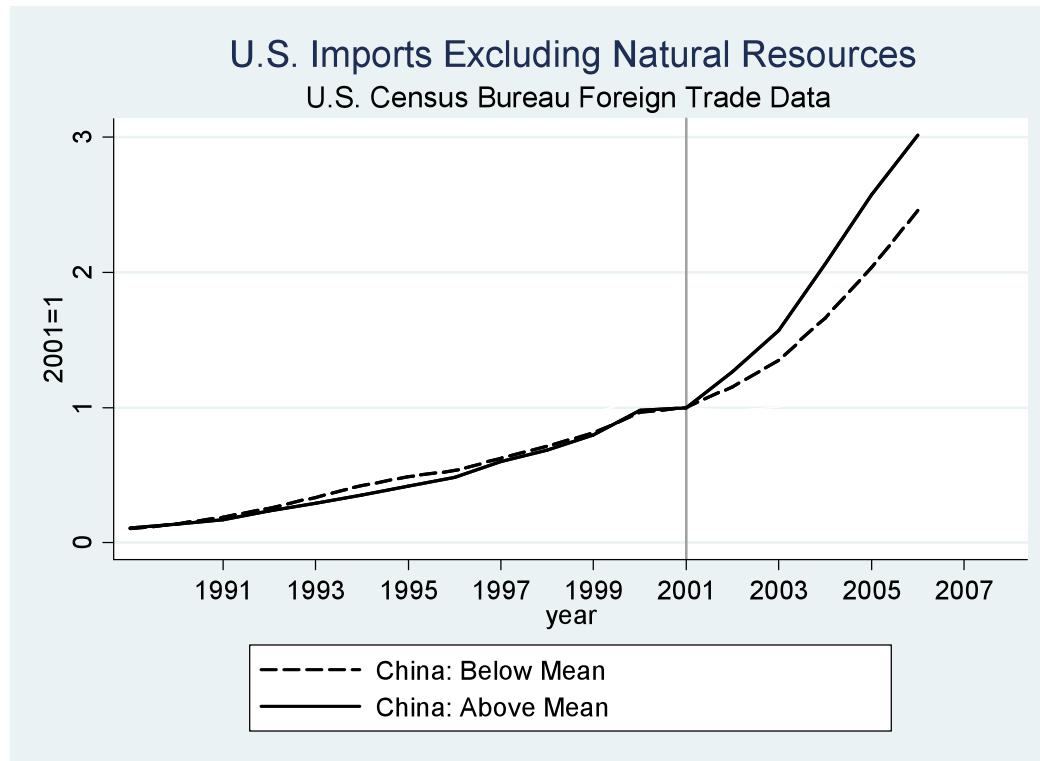
Public NBER-CES Data



- Split industries into two groups
 - Above median exposure
 - Below median exposure
- Trends are parallel before PNTR but diverge after PNTR
- (We use the gap as a continuous variable in our regression analysis.)

Preview of Findings – Trade

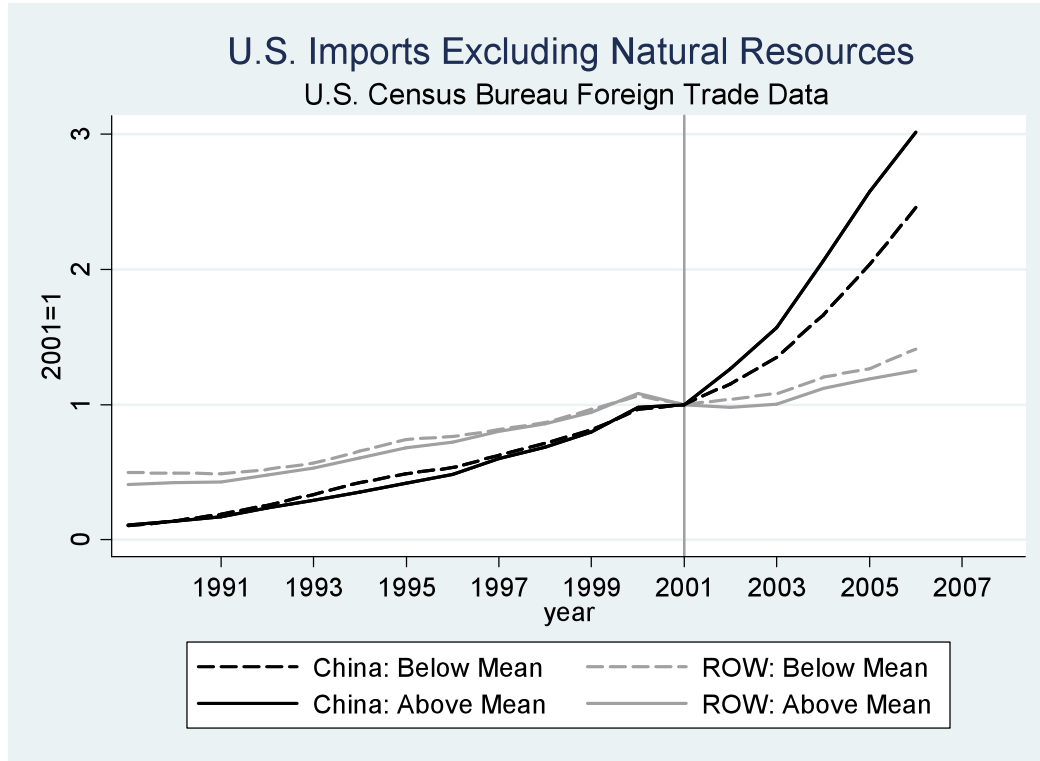
Public Census Trade Data



- Divergence is also evident in trade data
- Imports of more-exposed imports from China jump after PNTR relative to the imports from rest-of-world (ROW)

Preview of Findings – Trade

Public Census Trade Data



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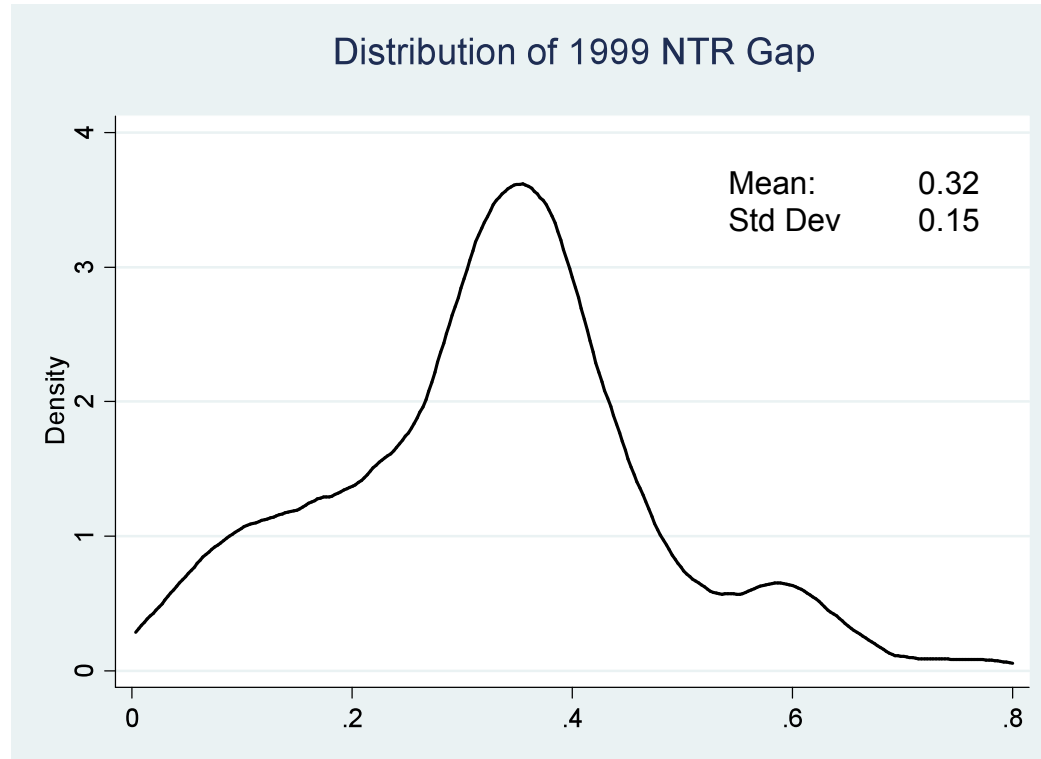
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$$\text{NTR Gap} = \text{Non-NTR Tariff} - \text{NTR Tariff}$$

- Compute NTR Gap for each HS8 using the *ad valorem* equivalent tariff rates from Feenstra, Romalis and Schott (2003)
- NTR Gap for industry i is the mean gap over the HS8s captured by the industry
- Available for 1989-2001, we use the NTR Gap for 1999 in the regression results to follow

Distribution of 1999 NTR Gap Across Industries



Census Employment Data

- LBD
 - Annual employment of all U.S. establishments, 1977-2009
- CM
 - Employment + other attributes for all manufacturing establishments every five years, 1977(5)2007
- LFTTD
 - Transaction-level US import data
 - Value
 - HS Product
 - Importer ID
 - Foreign exporter ID

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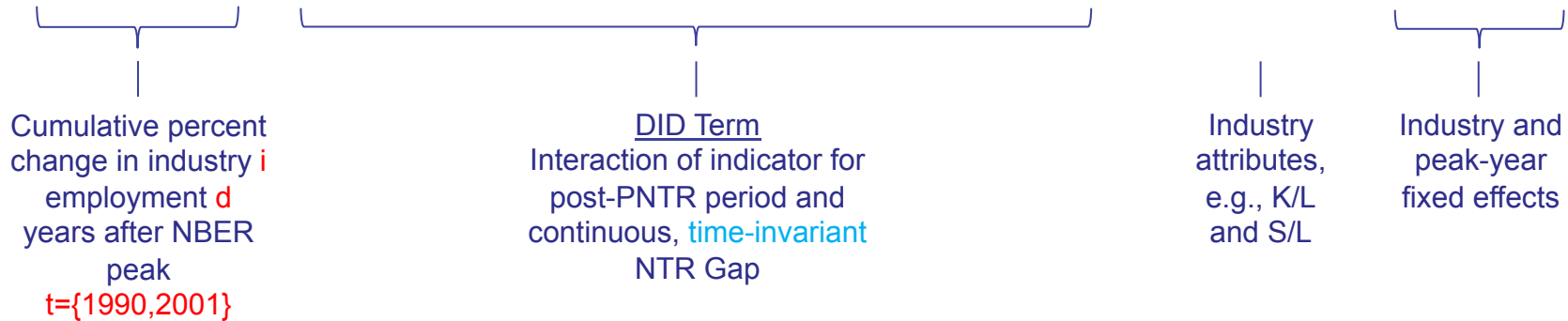
Empirical Strategy

- We use a **difference-in-differences** strategy to examine the link between PNTR/WTO and U.S. manufacturing employment outcomes
 - **1st difference**: industries with higher vs lower NTR Gaps
 - **2nd difference**: growth after 2001 versus after 1990 (prior peak)

Industry-Level OLS Diff-in-Diff (DID)

t = NBER peak {1990,2001}
 d = 1:6 years after peak
 i = industry

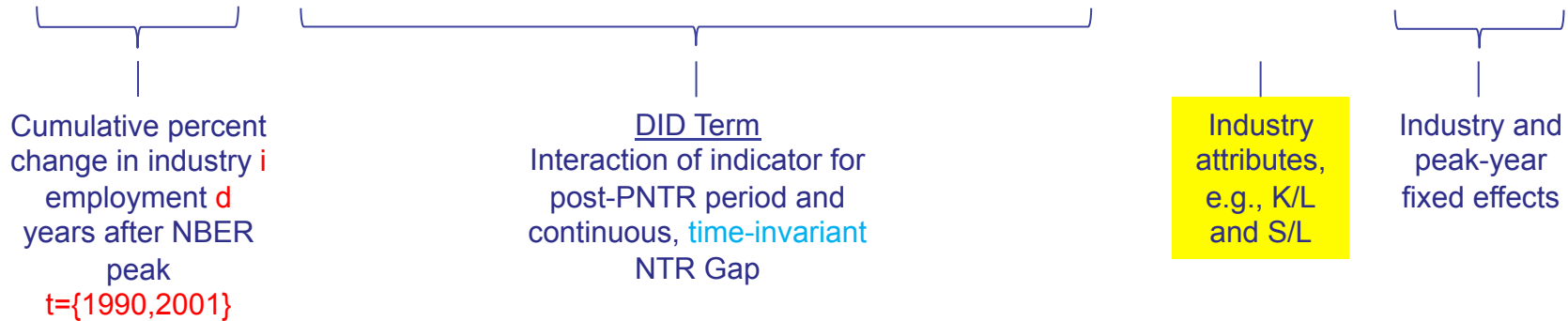
$$\frac{\Delta E_i^{t:t+d}}{E_i^t} = \alpha_d 1\{post - PNTR\} \times NTR\ Gap_i^{1999} + \gamma_d \mathbf{X}_{it} + \delta_{id} + \delta_{td} + \varepsilon_{itd}$$



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- Two sets of results
 - Baseline: only control for industry capital and skill intensity
 - Extended: control for everything we can think of

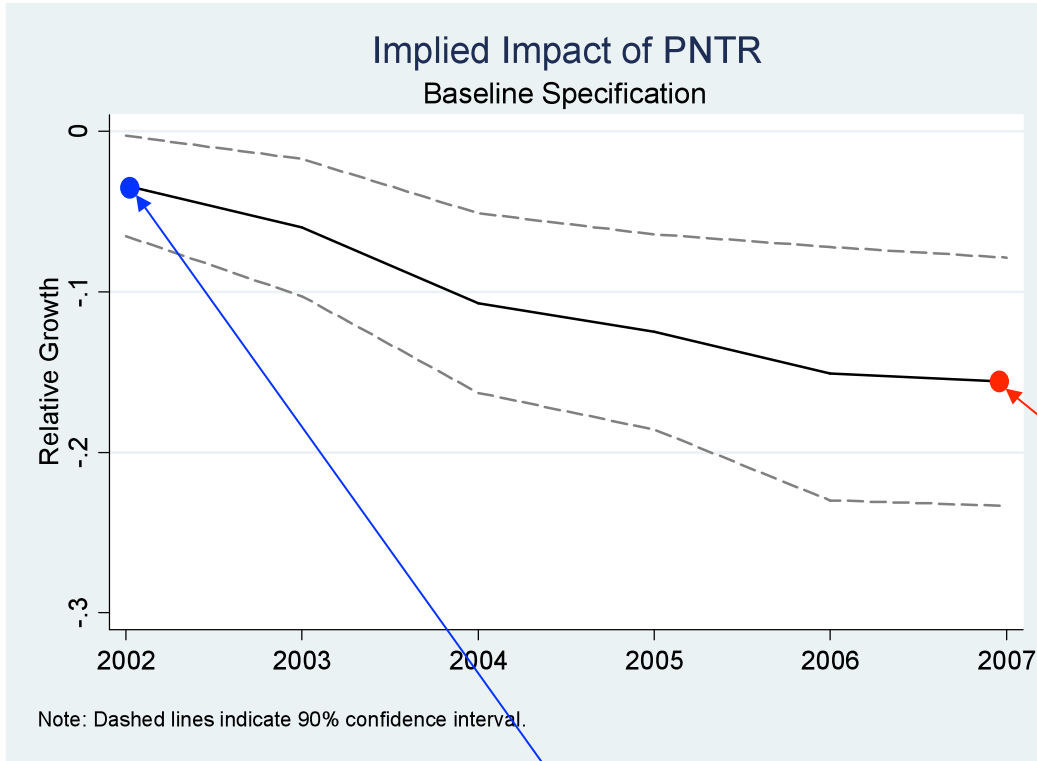
Basic Industry-Level Regressions

Bold=statistically significant at 10% level

	Percent Change in Industry Employment					
	Years After NBER Peak (LBD)					
	1	2	3	4	5	6
1{post-PNTR} x NTR Gap _i	-0.104 0.058	-0.187 0.082	-0.332 0.105	-0.387 0.114	-0.469 0.149	-0.482 0.147
ln(K/L _{it})	-0.058 0.036	-0.032 0.056	0.021 0.071	0.099 0.077	0.140 0.101	0.170 0.093
ln(S/L _{it})	-0.048 0.046	-0.110 0.059	-0.140 0.075	-0.131 0.087	-0.087 0.096	-0.108 0.111
Observations	652	652	652	652	652	652
R2	0.67	0.70	0.70	0.70	0.66	0.66
Fixed Effects	i,t	i,t	i,t	i,t	i,t	i,t
Employment Weighted	Yes	Yes	Yes	Yes	Yes	Yes
Implied Impact of PNTR	-0.034 0.019	-0.060 0.026	-0.107 0.034	-0.125 0.037	-0.151 0.048	-0.156 0.047

Baseline Results

DID Controlling for Industry K/L and S/L Only



After 7 years, cumulative employment growth is 15.6 percent lower than 7 years after the 1990 peak

After 1 year, cumulative employment growth is 3.4 percent lower than 1 year after the 1990 peak

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Alternate Explanations?

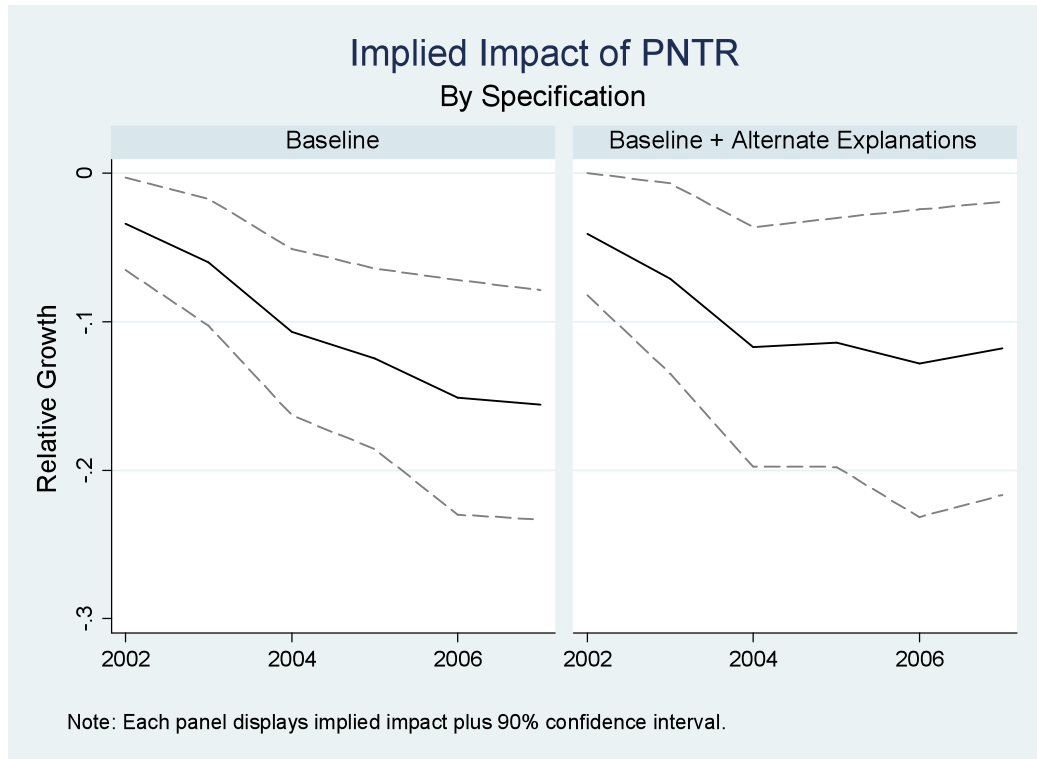
- Alternate explanations must explain:
 - Timing: why do U.S. employment fall and Chinese imports rise with PNTR?
 - Variation across industries: Why are changes in employment and imports greater for industries most affected by the policy change?
- Maybe the employment declines are related to changes in Chinese policy?
 - Not obvious why they would be correlated with the U.S. NTR gap, but we can check...

Alternate Explanations

- Changes in Chinese Policy
 - Reduce barriers to foreign investment – Nunn (2007)
 - Lower import tariffs – Brandt et al. (2013)
 - Eliminate export licensing requirements – Bai et al. (2007)
 - Eliminate production subsidies – Girma et al. (2007), Bown (2012)
- Union Resistance in the US – unionstats.org
- Bursting of the US tech bubble – IT dummy; control for prior growth
- Rising Chinese competitiveness – control for capital and skill intensity
- End of Textile and Clothing Quotas – Khandelwal et al. (2013)

Implied Impact of PNTR

Baseline vs Extended



Results are similar even after accounting for many alternate explanations

If we use different DID specifications, we also get similar results.

Outline

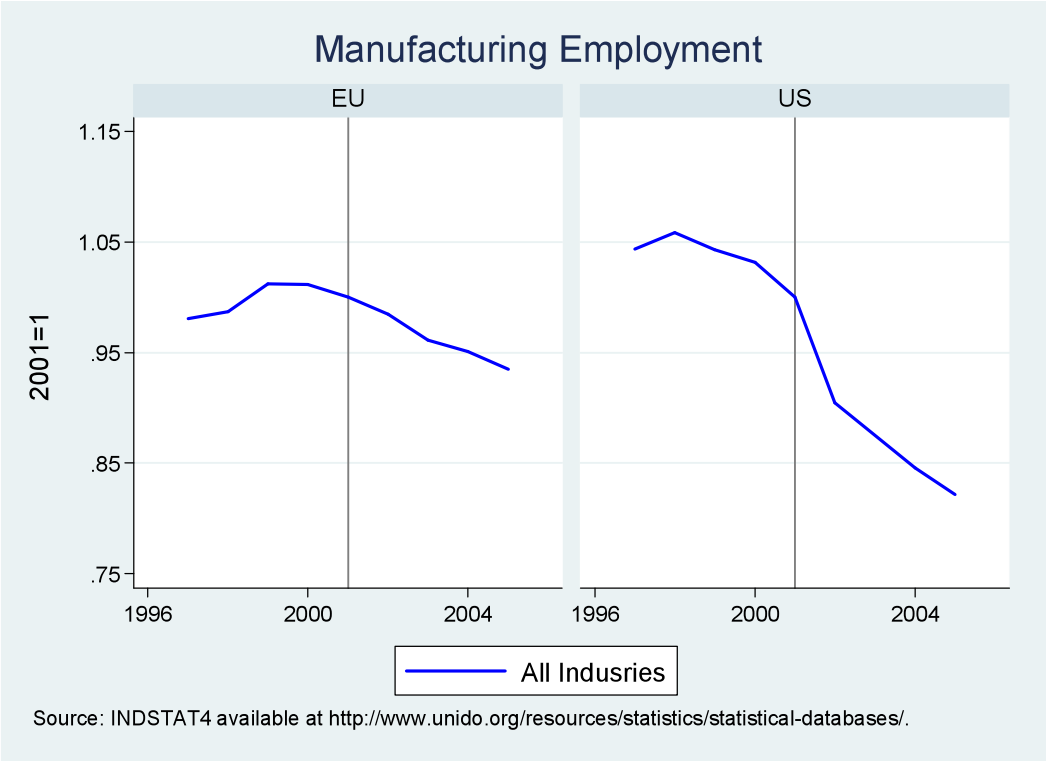
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 - Margins of Adjustment
 - Participation in trade by U.S. and Chinese firms
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Other Countries?

- The EU granted permanent NTR status to China in 1980
 - So, no annual renewals
- Dissimilarity of US and EU results indicates that the outcomes we observe in the U.S. are unlikely to be driven by
 - A productivity shock in China
 - A technology shock in industries that happen to have high gaps
- We can use employment from a different source – UNIDO – to compare the US and the EU

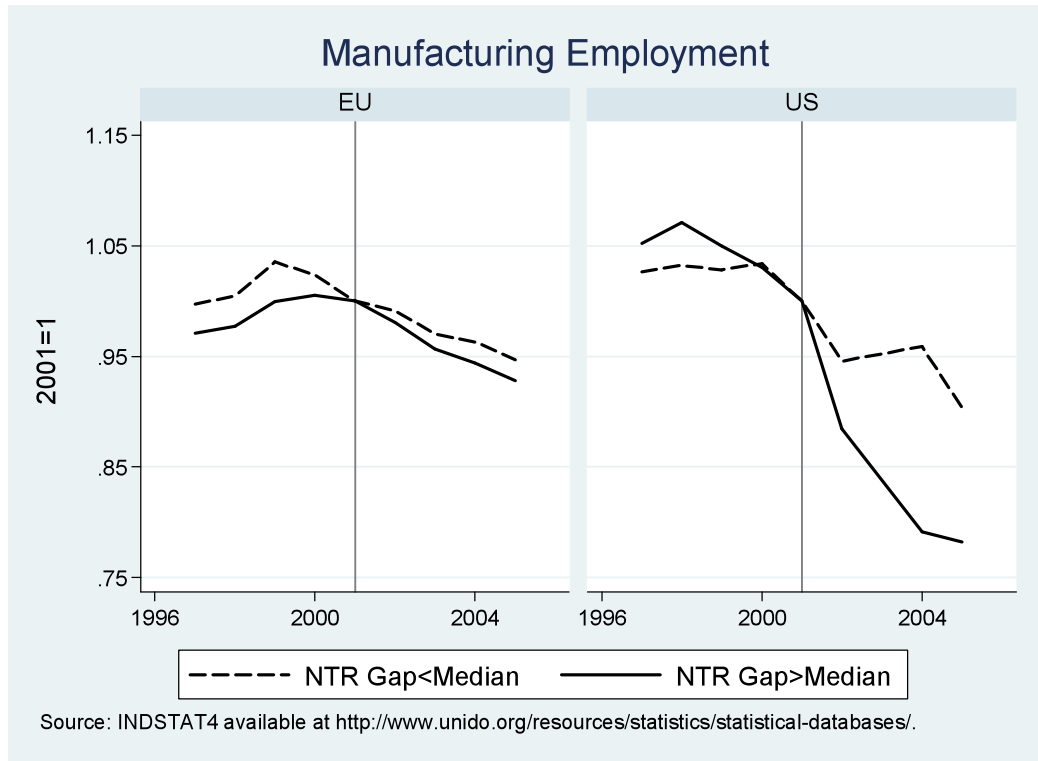
Overview of U.S. versus EU

Employment Data from UNIDO



Overview of U.S. versus EU

Employment Data from UNIDO



DID regression analysis reveals that the post-PNTR differences are statistically significant for the US but not the EU

The dissimilarity of US and EU results indicates that US outcomes are not driven by:

- (i) a productivity shock in China
- (ii) a technology shock in industries that happen to have high NTR gaps

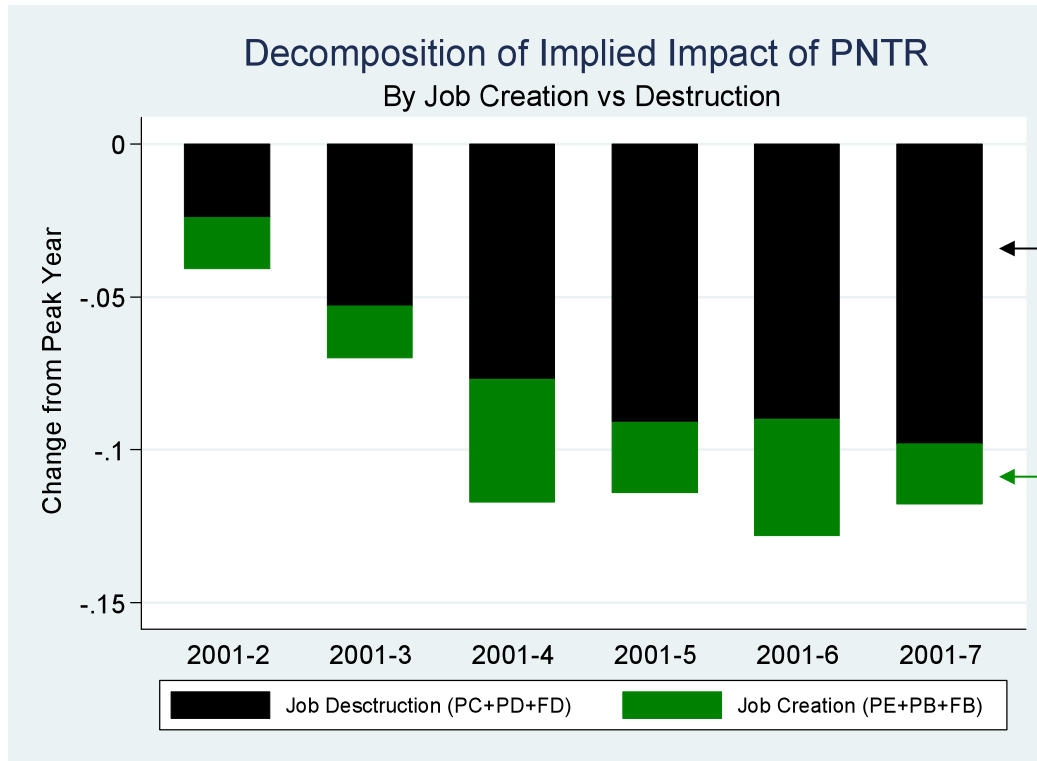
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Margins of Adjustment

- Job Destruction (JD)
 - PC: plant contraction at continuing firms
 - PD: plant death at continuing firms
 - FD: firm death
- Job Creation (JC)
 - PE: plant expansion at continuing firms
 - PB: plant birth at continuing firms
 - FB: firm birth

Implied Impact of PNTR



Contribution of exaggerated job destruction

Contribution of anemic job creation

JC contributes 17 to 41 percent across 2001-2007

Relates to research by Faberman (2012) on “jobless” recoveries and the end of the “great moderation” after 2001

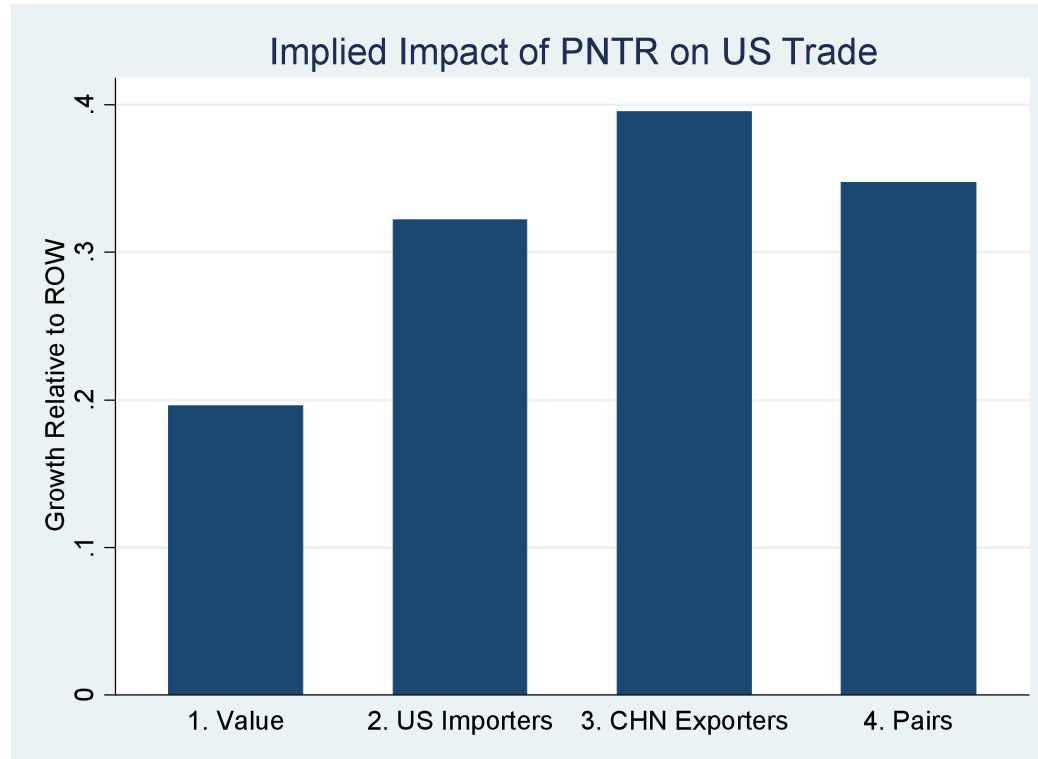
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Trade DID

- Trade data not available till 1990s
- So, amend DID to compare 2001-2005 to 1997-2001
 - 1st difference: products with higher vs lower NTR Gaps
 - 2nd difference: imports from China vs other U.S. trading partners
- Examine:
 - Value
 - Number of US importers
 - Number of Chinese exporters
 - Number of US-Chinese importer-exporter pairs

PNTR and U.S. Imports from China Implied Growth 2001-2005 vs 1997-2001



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Conclusions

- Strong link between US manufacturing job loss, US trade and PNTR
- U.S. imports from China surge in same industries where employment declines occur, along with number of U.S. importers, Chinese exporters and importer-exporter pairs
- Results are robust to inclusion of proxies for wide array of alternate explanations, as well as alternate specifications
- PNTR associated with both increased job destruction and decreased job creation

Thanks