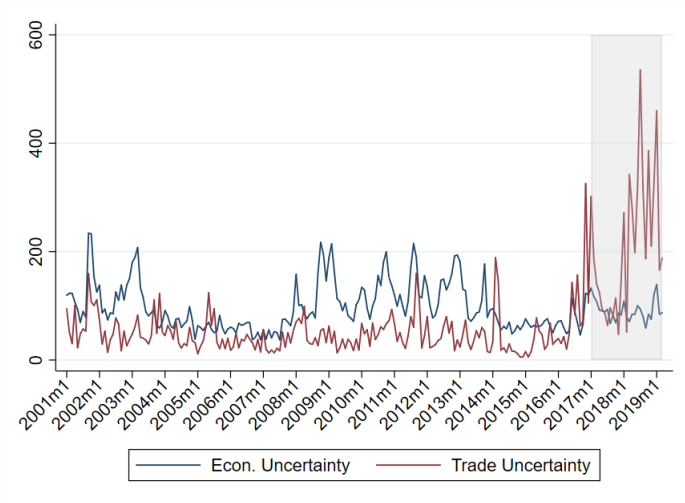# Trade Policy Uncertainty and Stock Returns

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September 19, 2019

Trade Policy Uncertainty Receiving Tons of Media Coverage

Baker, Bloom and Davis (2016) newspaper-based measures of policy uncertainty

Research Question

- ▶ Is there a risk premium associated with trade policy uncertainy?
    - ▶ If so, how large is this risk premium?
- ▶ How are different types of exposure priced?
    - ▶ Direct exposure: Competition channel
    - ▶ Indirect exposure: Input and output linkages

Setting

- ► 1980: China granted low tariffs reserved for WTO members
- ► 1989: Tiananmen Square Crackdown, Congress starts voting annually to revoke China's Normal Trade Relations (NTR) status
    - ► Industries heterogeneously exposed to policy change based on tariffs set in 1930's
- ► 1994/1998: Clinton goes against House Republicans, and pushes for Permanent Normal Trade Relations (PNTR)
- ► China was granted PNTR in 2000/2001

Stylized Facts

Average Annualized Returns
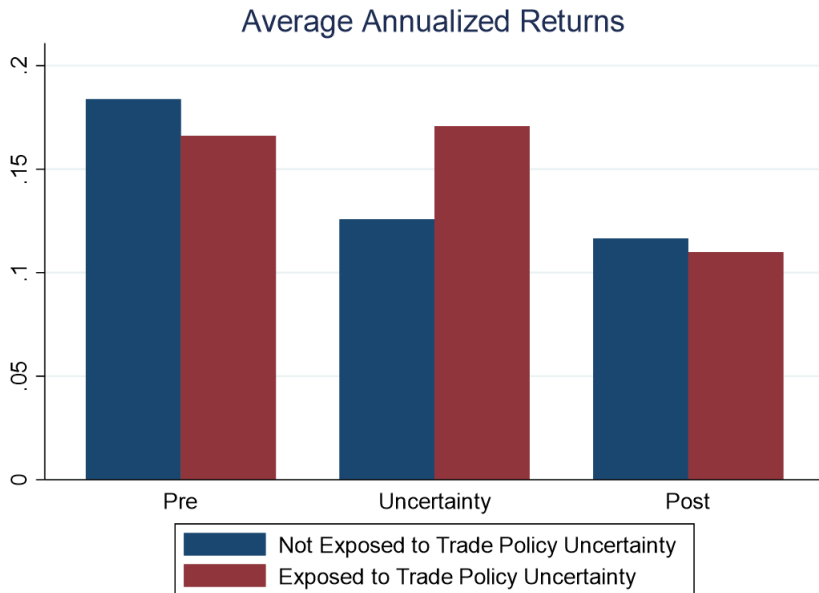
Main Results

- Firms exposed to trade policy uncertainty earned an additional 4.3% per year, relative to unexposed firms
  - Up/Down stream exposure to uncertainty is also priced
  - Effect is weaker in more concentrated industries
- Proposed explanation: Risk premium for policy uncertainty
  - Rule out compensation for China Shock and Chinese competition
  - Provide evidence against series of positive/negative surprises related to granting China PNTR
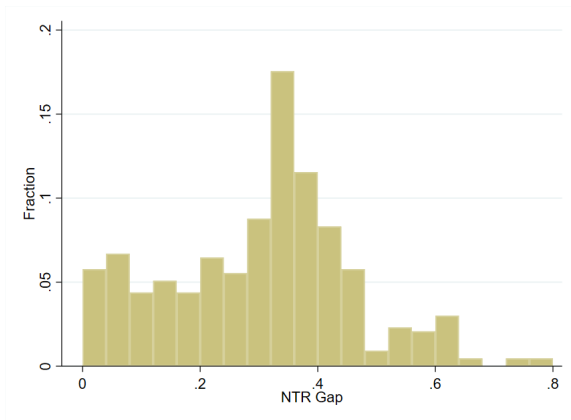
Outline

Baseline Results

Mechanism

Next Steps & Conclusion

Effect of removing NTR Status

- ▶ If NTR status revoked, *all* manufacturing tariffs revert to non-NTR rates, established in 1930 under Smoot-Hawley
- ▶ Define the *NTR gap$_{i,t}$ = Smoot Hawley$_i$ − NTR$_{i,t}$*
  - ▶ 79% of the variation in the NTR gap is from SH rates

Baseline Regression

Differences-in-Differences setup:

$$r_{i,t} = \alpha + \beta \left(NTRGap_{i,t-1} \times \mathbf{1}_{1990-2001} \right) + \\ \beta_1 NTRGap_{i,t-1} + \beta_2 \mathbf{1}_{1990-2001} + \gamma X_{i,t-1} + \varepsilon_{i,t} \tag{1}$$

- ► We are comparing returns of high and low gap industries, during/outside the tariff uncertainty period
    - ► Pre Period: 1980-1989
    - ► Treatment Period: 1990-2001 (Pre-PNTR)
    - ► Post Period: 2002-2007

High Gap ⇒ High Returns Pre-PNTR

	(1)	(2)	(3)	(4)	(5)
$NTRGap_{i,t-1} \times PrePNTR_t$	0.016***	0.017***	0.020***	0.025***	0.021***
	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)
$NTRGap_{i,t-1}$	-0.007	-0.010***	-0.011***	-0.009*	-0.009*
	(0.005)	(0.003)	(0.003)	(0.005)	(0.005)
$PrePNTR_t$	-0.004***	-0.004***	-0.005***	-0.006***	
	(0.001)	(0.001)	(0.001)	(0.001)	
Observations	41,241	41,241	40,689	40,689	40,689
R-squared	0.001	0.001	0.002	0.003	0.091
Policy Controls	No	Yes	Yes	Yes	Yes
Matched Control Sample	No	No	Yes	Yes	Yes
Firm Controls	No	No	No	Yes	Yes
Month Fixed Effects	No	No	No	No	Yes
Industry Fixed Effects	No	No	No	No	No

Going from 25th percentile NTR gap (ex. Aluminum Sheet, Plate, and Foil Manufacturing), to 75th percentile NTR gap (ex. Heating Equipment Manufacturing), increases stock returns by 4.3% per year

Robustness Checks

- ► Alternative weights and standard errors `table`
- ► Conditioning on exposure to systematic risk, or putting multi-factor residuals on LHS `table`
- ► Alternative industry definitions, constant manufacturing sample, tech boom/bust `table`
- ► Exogeneity tests `table`

Input Output Linkages

- ► So far we have been measuring tariffs on *direct* competitors
- ► Why input/output (I/O) linkages may matter:
  - ► "We cannot plan and run our business if we are wondering whether our most important source of supply is about to disappear. Without continuity and certainty of supply, American toy companies also cannot plan to take advantage of the growing Chinese market." Harry Pearce, CFO of Tyco Toys, 1996 `more examples`

Upstream/Downstream Exposure ⇒ Higher Returns Pre-PNTR

| | China | | US | | |
	Inputs	Outputs	Inputs	Outputs	Inputs
China Inputs Exposure	0.040***				
	(0.011)				
US Outputs Exposure		-0.001			
		(0.027)			
US Inputs Exposure			0.04		
			(0.049)		
US Outputs Exposure (L)				0.040**	
				(0.016)	
US Inputs Exposure (L)					0.066***
					(0.020)
Observations	34,329	34,329	34,329	34,329	34,329
R-squared	0.087	0.086	0.086	0.087	0.087
Policy Controls	Yes	Yes	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes	Yes
Ind/Month Fixed Effects	Yes	Yes	Yes	Yes	Yes

Magnitudes: China inputs: 1.6%-2.5% per year, US inputs, 2.5%-9.5% per year and US outputs,4.6%-5.6% per year.

Definition/Example

Market Power $\Rightarrow$ Lower Returns Pre-PNTR

	Matched	Top 8	HHI 50
$NTRGap_{i,t-1} \times PrePNTR_t$	0.023***	0.038***	0.028***
	(0.007)	(0.010)	(0.007)
Concentration Measure		0.001	0.034
		(0.006)	(0.050)
Concentration Interaction		-0.036**	-0.128**
		(0.018)	(0.062)
Observations	40,413	40,413	40,413
R-squared	0.399	0.400	0.400
Policy Controls	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes
Ind/Month Fixed Effects	Yes	Yes	Yes

Note: This is run with SIC-4 portfolios, instead of Pierce and Schott industry families Baseline effect in matched sample: 3% per year. Effect of concentration: -1.1% to -2.4% per year.

Outline

Possible Mechanisms

1. Uncertainty risk premium
2. Compensation for China shock and/or expected Chinese competition
3. Series of positive/negative shocks

We are open to your suggestions about how to better isolate these channels

Mechanism 1: Risk Premium

- Uncertainty about trade policy with China from 1990-2001
- Not obvious whether China would be charged high tariffs, or granted PNTR
    - Effects of high/low tariffs were uncertain, as evidenced by mixed returns on NTR voting dates (table)
- High gap firms more exposed to possible policy changes
- Investors holding high gap firms required compensation for risk associated with trade policy uncertainty

Portfolio Analysis

	Low Gap	2	High Gap	TPU
PrePNTR$_t$	-0.004	-0.001	0.006**	0.010**
	(0.003)	(0.002)	(0.002)	(0.004)
Market	0.749***	0.952***	1.053***	0.305***
	(0.051)	(0.028)	(0.031)	(0.066)
Size	-0.074	-0.151***	0.129**	0.203**
	(0.064)	(0.041)	(0.055)	(0.097)
Value	0.420***	-0.272***	-0.343***	-0.763***
	(0.097)	(0.064)	(0.069)	(0.144)
Profitability	0.197**	0.075	-0.367***	-0.564***
	(0.082)	(0.054)	(0.061)	(0.127)
Investment	0.022	0.408***	-0.246***	-0.268
	(0.126)	(0.075)	(0.093)	(0.190)
Observations	336	336	336	336
R-Squared	0.502	0.854	0.905	0.574

Mechanism 2: Expected Chinese Competition

- Effects of Chinese competition on US firms *after* PNTR are well documented
  - Autor, Dorn and Hanson (2013) [ADH]
  - Pierce and Schott (2016), Handley and Limao (2017), etc.
- Add ADH shock to our baseline regression (table)
- Add imports of goods from China to baseline

Chinese Competition Not Significant

	(1)	(2)	(3)
$NTRGap_{i,y-1} \times PrePNTR_t$	0.0243***	0.0253**	0.0252**
	(0.009)	(0.011)	(0.010)
$China_i \times PrePNTR_t$		0.0038	0.0027
		(0.011)	(0.012)
$NTRGap_{i,y-1} \times PrePNTR_t \times China_i$		-0.0126	-0.0134
		(0.033)	(0.033)
$\Delta IP_{i,t} \times PostPNTR_t$			-0.0001
			(0.000)
Observations	21,405	21,297	21,297
R-squared	0.108	0.108	0.108
Policy Controls	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes
Ind/Month Fixed Effects	Yes	Yes	Yes

Mechanism 3: Positive/Negative Shocks

- ► Global shocks to high/low gap industries between 1990-2001
- ► High gap firms suffered after from Chinese competition after PNTR
    - ► Series of Positive Shocks in Pre Period: Each year China was not granted PNTR was good news for high gap firms
    - ► Series of Negative Shocks in Post Period: People did not fully anticipate effects of Chinese competition

No Effect of NTR Gap Outside the US

	Japan	Korea	UK	France	Australia
$NTRGap_{i,t-1} \times PrePNTR_t$	0.003	0.008	0.008	0.003	0.007
	(0.007)	(0.015)	(0.010)	(0.009)	(0.011)
$NTRGap_{i,t-1}$	-0.003	-0.02	-0.011	-0.004	-0.019*
	(0.006)	(0.017)	(0.012)	(0.007)	(0.011)
Observations	18,372	3,993	13,129	7,278	5,173
R-squared	0.479	0.601	0.26	0.565	0.317
Policy Controls	Yes	Yes	Yes	Yes	Yes
Firm Controls	No	No	No	No	No
Month Fixed Effects	Yes	Yes	Yes	Yes	Yes

Voting Day Effects

| Dependent Variable: Event Day Returns | | | | |
| | Real Voting Dates | | Placebo Voting Days | |
	Signed	Absolute	Signed	Absolute
Lagged NTR Gap	-0.016	0.034***	-0.006	0.009
	(0.011)	(0.007)	(0.012)	(0.007)
Constant	0.003	0.014***	0.003	0.021***
	(0.003)	(0.002)	(0.003)	(0.002)
Observations	1,355	1,355	1,349	1,349
R-squared	0.008	0.067	0.001	0.006

Table with all voting days (table), and PNTR/Earnings
Announcement dates (table)

Average Returns Regressions, With Event Dates Removed

	All	Ex. PNTR	Ex. Votes	Ex. Earn	Ex. All
$NTRGap_{i,t-1} \times PrePNTR_t$	0.015**	0.016***	0.017***	0.012*	0.014***
	(0.006)	(0.006)	(0.005)	(0.006)	(0.005)
$NTRGap_{i,t-1}$	-0.010*	-0.011*	-0.011*	-0.009*	-0.010*
	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)
Observations	40,689	40,689	40,689	40,689	40,689
R-squared	0.379	0.38	0.383	0.365	0.371
Policy Controls	Yes	Yes	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes	Yes
Month Fixed Effects	Yes	Yes	Yes	Yes	Yes

Outline

Dow Tumbles Nearly 800 Points as Trade Jitters Return

Donald J. Trump ✔
@realDonaldTrump

….I am a Tariff Man. When people or countries come in to raid the great wealth of our Nation, I want them to pay for the privilege of doing so. It will always be the best way to max out our economic power. We are right now taking in $billions in Tariffs. MAKE AMERICA RICH AGAIN

7:03 AM - 4 Dec 2018

Index performance on Tuesday

Dow industrials
S&P 500
Nasdaq

Conclusion

- ► Large risk premium for exposure to trade policy uncertainty, over 4% per year
- ► Upstream/Downstream exposure priced
- ► Effect is weaker in more concentrated industries
- ► Rule out alternative channels, such as Chinese competition and series of positive/negative shocks
- ► Results consistent with Pastor Veronesi (2012/2013): Risk premium, realized volatility, jumps on announcement dates – more to be done on modeling side

Additional Slides

Additional Anecdotal Evidence

- Testifying before the House on June 1997, Eugene Milosh, President of the American Association of Exporters and Importers, stated: "Any annual review process introduces uncertainty, weakening the ability of U.S. traders and investors to make long-run plans, and saddles US/China trade and investment with a risk factor cost not faced by our international competitors".

- Testifying before the House on February 2000, Thomas St. Maxens, a representative from Mattel, asserted that "while the risk that the United States would withdraw NTR status from China may be small, if it did occur the consequences would be catastrophic for US toy companies given the 70 percent non-MFN US rate of duty applicable to toys".
  - Uncertainty was substantial, even just months before the PNTR was granted!

back

Weights and Standard Errors

	(1)	(2)	(3)	(4)
$NTRGap_{i,t-1} \times PrePNTR_t$	0.021**	0.024**	0.021***	0.019***
	(0.009)	(0.010)	(0.006)	(0.005)
$NTRGap_{i,t-1}$	-0.009		-0.006	-0.010**
	(0.007)		(0.005)	(0.004)
Observations	40,689	40,689	41,144	39,776
R-squared	0.091	0.095	0.046	0.13
Firm Controls	Yes	Yes	Yes	Yes
Month Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	No	Yes	No	No

Column 1: Double clustered standard errors at industry/month level.
Column 2: Double clustering, and add industry fixed effects.

Column 3: Last-year weights. Column 4: 1979 weights. back

Additional Robustness

	Baseline	CRSP	No Elec.	Beta	MF Resids.	Con50
$NTRGap_{i,t-1} \times PrePNTR_t$	0.021***	0.015***	0.020***	0.019***	0.021***	0.021***
	(0.005)	(0.006)	(0.005)	(0.005)	(0.004)	(0.006)
$NTRGap_{i,t-1}$	-0.009*	(0.001)	(0.007)	(0.006)	-0.009***	(0.010)
	(0.005)	(0.004)	(0.005)	(0.005)	(0.002)	(0.007)
Observations	40,689	34,259	39,405	35,553	40,689	35,793
R-squared	0.091	0.098	0.108	0.102	0.061	0.083
Policy Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Month Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

back

Exogeneity

	NTR Gap 1990		NTR Gap 1999		IV (1990)		Placebo	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$NTRGap_{i,1990} \times PrePNTR_t$	0.015**	0.020***						
	(0.006)	(0.006)						
$NTRGap_{i,1990}$	-0.006	-0.008*					0.000754	-0.0197
	(0.005)	(0.005)					(0.003)	(0.025)
$NTRGap_{i,1999} \times PrePNTR_t$			0.017***	0.022***				
			(0.005)	(0.005)				
$NTRGap_{i,1999}$			-0.005	-0.004				
			(0.004)	(0.004)				
IV: $NTRGap_{i,t-1} \times PrePNTR_t$					0.017***	0.027***		
					(0.004)	(0.008)		
Placebo: $NTRGap_{i,t-1} \times PrePNTR_t$							0.00339	0.0032
							(0.005)	(0.005)
Observations	41,241	40,689	41,241	40,689	41,241	40,689	41,241	40,689
R-squared	0.089	0.091	0.089	0.092	0.089	0.093	0.09	0.095
Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Level Controls	No	Yes	No	Yes	No	Yes	No	Yes

back

Mixed Results on Voting Dates

Dependent variable: Returns in from t-1 to t+3

MFN-Status Voting Date Vote Result:	10/18/1990 House/Pass	7/10/1991 House/Pass	7/21/1992 House/Pass	6/8/1993 House/Reject	8/9/1994 House/Reject	7/20/1995 House/Table	6/27/1996 House/Reject
Lagged NTR Gap	0.0813***	0.00831	-0.0259**	-0.0413*	0.0738***	-0.0589*	-0.0332
	(0.0169)	(0.0107)	(0.0117)	(0.0210)	(0.0213)	(0.0308)	(0.0232)
Observations	126	126	124	123	123	123	122
R-squared	0.234	0.01	0.071	0.085	0.319	0.135	0.105

MFN-Status Voting Date Vote Result:	6/24/1997 House/Reject	7/16/1997 Senate/Reject	7/22/1998 House/Reject	7/20/1999 House/Reject	7/27/1999 Senate/Reject	7/18/2000 House/Reject
Lagged NTR Gap	-0.0259	0.023	-0.0866*	-0.103***	-0.0218	-0.0676**
	(0.0297)	(0.0371)	(0.0443)	(0.0341)	(0.0243)	(0.0278)
Observations	122	122	122	119	119	117
R-squared	0.044	0.013	0.152	0.223	0.025	0.094

back

China's MFN Status

- ▶ 1980: China granted MFN status, required annual renewal
- ▶ 1980-1989: Annual renewal of MFN status essentially automatic
- ▶ 1989: Tiananmen Square crackdown. Congress wanted MFN status to be conditional on human rights conditions
- ▶ 1990-2001: Annual votes on China's MFN status, with House passing resolutions to revoke MFN in 90, 91 and 92
  - ▶ In 1992, House & Senate pass resolution to revoke MFN unless China has met conditions related to (1) Human Rights (2) Intellectual Property (3) Tariffs (4) Nuclear Proliferation
  - ▶ This was Vetoed by G. H.W. Bush. House overrode, but Senate Failed

Removing Tariff Uncertainty

- ▸ 3/8/2000: Clinton submits proposal to grant PNTR
- ▸ 5/24/2000: House passes amended version of Clinton plan
- ▸ 9/19/2000: Senate passes un-amended version of Clinton plan
- ▸ Clinton signed US-China Relations Act on Oct 10, 2000
  - ▸ Granted China PNTR but was contingent on China's accession to the WTO
- ▸ China joined the WTO on December 11, 2001
- ▸ PNTR became effective on January 1, 2002

Including 2001 in Pre-PNTR Period

Why include 2001, even though Clinton gave conditional NTR in 2000?

▶ "Protracted accession negotiations and a jet fighter collision meant that in the summer of 2001 Congress again voted on whether to revoke MFN. China joined the WTO on December 11, 2001 and the United States effectively enacted PNTR on January 1, 2002. This strongly suggests that uncertainty about column 2 tariffs was not reduced until 2002." From Handley and Limao (2015)

PNTR Dates/Earnings Announcements

	(1)	(2)	(4)
	PNTR Dates		Earnings ann.
	10/10/2000	12/11/2001	
Lagged NTR Gap	-0.159**	0.0099	
	(0.07)	(0.03)	
Lagged NTR Gap x Pre-PNTR			0.00727*
			(0.00)
Observations	117	112	103,951
R-squared	0.114	0.003	0.012
Event Window	t-1 to t+3	t-1 to t+3	t-5 to t+1

Dependent variable: Event-Day Returns

▶ From Griffin (2018) 5/24/2000 high gap firms drop

▶ Granting PNTR 10/10/2000 – Implies an average realized stock return of -4.5%, relative to a hypothetical industry with a zero NTR gap.

▶ Earnings days: While statistically significant, effect is economically small

back

Summary Statistics

Variable	1990			1999			2007		
	Low-Gap	High-Gap	t-Stat	Low-Gap	High-Gap	t-Stat	Low-Gap	High-Gap	t-Stat
NTR Gap in 1999	0.10	0.43	13.77	0.17	0.45	9.09	0.16	0.45	10.72
Market Capitalization ($B)	12.88	13.10	0.05	55.35	109.18	1.60	82.89	85.50	0.06
EV/EBITDA	6.21	8.44	3.51	13.80	23.55	3.01	10.60	11.32	0.44
Price / Earnings per Share	13.92	15.16	0.46	31.71	38.11	1.00	13.64	20.64	2.16
Price / Book	1.85	4.17	4.75	5.32	11.35	4.68	3.83	5.47	2.82
Return on Equity	0.05	0.05	-0.78	0.04	0.03	-1.92	0.04	0.04	0.12
Return on Invested Capital	0.05	0.13	3.21	0.13	0.25	0.89	0.07	0.30	1.64
Dividend Yield	0.05	0.03	-5.46	0.02	0.01	-2.19	0.02	0.02	-0.59
Total Sales ($B)	23.48	9.54	-1.77	36.09	17.98	-1.59	70.30	22.91	-1.44
Current Ratio	1.26	2.07	5.20	1.49	1.97	2.84	1.64	2.15	3.55
Debt / Equity	0.68	0.26	-3.59	0.37	0.06	-4.99	0.29	0.09	-3.20

Industry Families

"As noted in the main text, we use the algorithm developed in Pierce and Schott (2012b) to create a constant manufacturing sample over which employment changes can be analyzed. This algorithm creates *families* of four-digit SIC and six-digit NAICS codes that group related SIC and NAICS categories together over the 1977 to 1997 and 1997 to 2007 periods over which SIC and NAICS codes were used, respectively."

Examples of families: Manufacture of plastics products; Manufacture of basic chemicals, except fertilizers and nitrogen compounds, Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet paper; Manufacture of paints, varnishes and similar coatings, printing ink and mastics

Measuring Upstream/Downstream Exposure

Follow Acemoglu et. al. (2016):
$USInputs_{j,t} = \sum_s \omega_j^s Gap_{j,t-1}$ where ω_j^s is the share of
<u>intermediate</u> inputs expenditures of US industry j on US
industry s, among spending on inputs from US industries.

Example: Industry j buys \$50 inputs from China, \$25 from
industry i in US and \$25 from industry k in US. The US
industries have gaps of 0.1 and 0.3, so US Upstream =
$([25/50] \times 0.1 + [25/50] \times 0.3) = 0.2$

Following Acemoglu et. al., if your inputs come from a non-manufacturing sector, the NTR Gap is set to zero, which
is why the average upstream/downstream measures is lower than the average NTR gap.

Adding Autor et. al. (2013) Shock to Baseline

	(1)	(2)	(3)
$NTRGap_{i,t-1} \times PrePNTR_t$	0.0243***	0.0232**	0.0196**
	(0.009)	(0.009)	(0.009)
$\Delta IPW_{i,t}$		-4.49E-05	-0.00019
		(0.000)	(0.000)
Observations	21,405	21,405	21,405
R-squared	0.108	0.108	0.104
Policy Controls	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes
Industry/Month Fixed Effects	Yes	Yes	Yes

Column 1: Baseline regression in matched sample.
Column 2: Add US import penetration.

Column 3: Insturment US import penetration with other high-income countries. back

Volatility

Pastor Veronesi (2011) show that policy changes increase both realized and implied volatility.

	(1)	(2)	(3)	(4)	(5)	(6)
$NTRGap_{i,t-1} \times PrePNTR_t$	0.009***	0.009***	0.009***	0.008***	0.005*	0.005**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
$NTRGap_{i,t-1}$	0.005**	0.005**	0.005**	0.002	0.003	
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	
$PrePNTR_t$	-0.001***	-0.001***	-0.001***	-0.001***		
	0.000	0.000	0.000	0.000		
Observations	41,241	41,241	40,689	40,689	40,689	40,689
R-squared	0.037	0.037	0.037	0.06	0.424	0.48
Policy Controls	No	Yes	Yes	Yes	Yes	Yes
Matched Control Sample	No	No	Yes	Yes	Yes	Yes
Firm Controls	No	No	No	Yes	Yes	Yes
Month Fixed Effects	No	No	No	No	Yes	Yes
Industry Fixed Effects	No	No	No	No	No	Yes