

Trade policy uncertainty and exports: Evidence from China's WTO accession

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Question & Stylized facts

- **Question:** How the reduction in future trade policy uncertainty affects firms' export decisions
 → China's firms' export to the US (2000-2006), China's WTO accession (2001)

- **Two stylized facts**

- **Aggregate reallocation (export dynamics in China)**

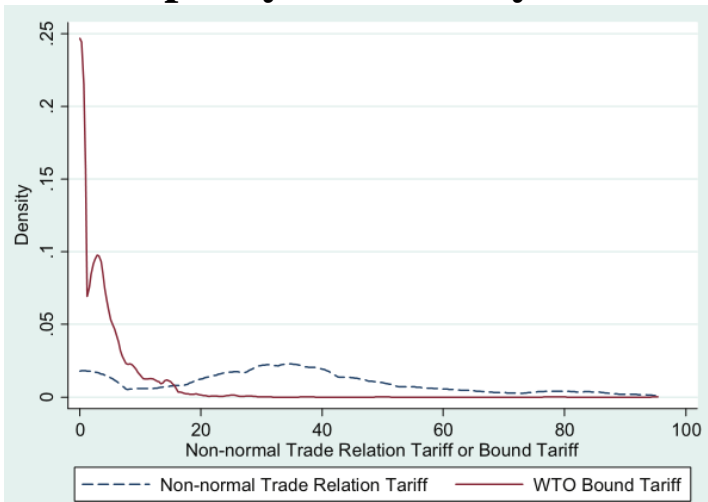
Different firms' ownership

Panel A: Market share changes 2000–2006, overall and by firm ownership		State-Owned Enterprises	Foreign-Invested Enterprises	Domestic Private Firms
Margin	All	SOE	FIE	DOM
	(1)	(2)	(3)	(4)
(1) Incumbents net entry	-10.484***	-5.484***	-4.663***	-0.336***
(2) Exiters	-75.995***	-52.107***	-19.761***	-4.127***
(3) New exporters	67.144***	9.906***	26.836***	30.402***
(4) Adders	19.335***	11.468***	5.989***	1.879***
(5) Total net entry	10.484***	-30.734***	13.064***	28.154***
(6) Total	0	-36.218***	8.401***	27.817***

Four margins of adjustment

} New entrants

- **Trade policy uncertainty**



Worst-case tariffs ↓ → Trade policy uncertainty ↓

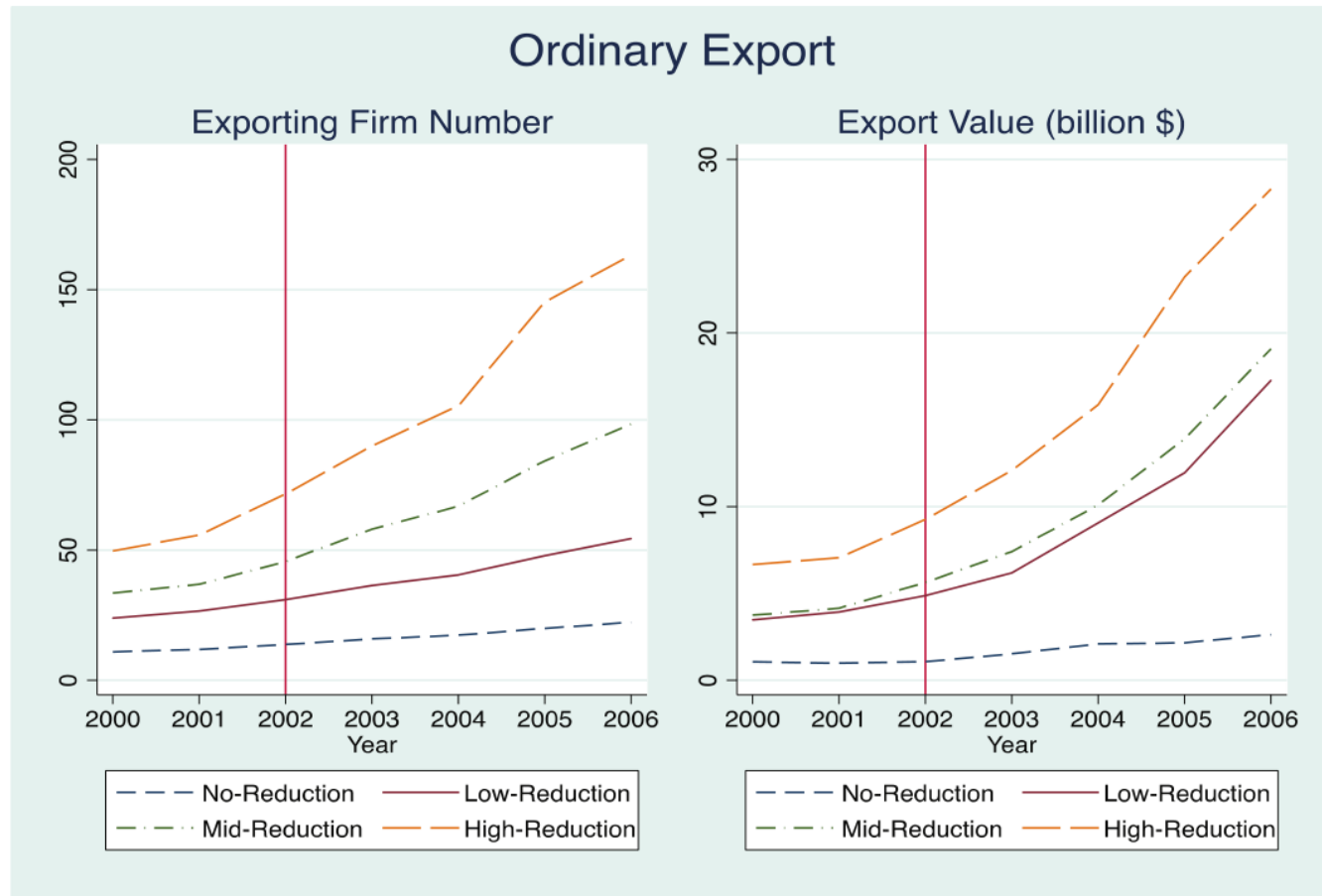
- Before: US special rate of duty
- After: much lower WTO-bound tariffs

Methodology: Theoretical Model

- Incorporate trade policy uncertainty into Melitz(2003) → heterogeneous firm model
- **Basic setting:** (CES + monopolistic competition)
 - CES Preferences: $U = \left[\int_{\omega \in \Omega} q(\omega)^{\frac{\sigma-1}{\sigma}} d\omega \right]^{\frac{\sigma}{\sigma-1}}$, where $\sigma < 1$
 - Demand for each variety ω : $q(\omega) = Q \left[\frac{p(\omega)}{P} \right]^{-\sigma}$, where $P = \left[\int_{\omega \in \Omega} p(\omega)^{1-\sigma} d\omega \right]^{\frac{1}{1-\sigma}}$ is the aggregate price, Q is the total quantity demanded in this industry
- **Trade policy and uncertainty:** $\tau > 1$; arrival rate(λ); new tariff $\sim H(\tau)$ with support $[1, \bar{\tau}]$ where $\bar{\tau} \geq \tau$
- **Firm decisions:**
 - Sunk entry cost f_e
 - Productivity φ with CDF $G(\varphi)$ and PDF $g(\varphi)$
 - For exporters: **per-period fixed export cost $M^\eta f$** , where M is total mass of exporters, $\eta \geq 0$ represents the degree of **congestion externalities** involved in entering export markets
- **Firm's export participation** (Based on present value of variable profit and the fixed cost)
 - $v_p(\tau_t, \varphi) = v(\tau_t, \varphi) + \rho((1 - \lambda)v_p(\tau_t, \varphi) + \lambda E_\tau v_p(\tau_{t+1}, \varphi)) \rightarrow v_p(\tau_t, \varphi) = BRT_t \varphi^{\sigma-1}$
where $B = \frac{1}{M\sigma(1-\rho)\tilde{\varphi}^{\sigma-1}}$, and $T_t = \delta_a \tau_t^{-1} + \delta_E E_\tau(\tau^{-1})$, $\delta_a = \frac{1-\rho}{1-p(1-\lambda)}$, $\delta_E = \frac{\rho\lambda}{1-p(1-\lambda)}$, $\delta_a + \delta_E = 1$
 - Expected profit: $\pi_p(\tau_t, \varphi) = BRT_t \varphi^{\sigma-1} - M^\eta f / (1 - p) \rightarrow$ **Cutoff productivity φ^* : $\pi_p(\tau_t, \varphi^*) = 0$**
 - $\varphi \geq \varphi^*$: export
- **Conclusion:** Trade policy uncertainty $\downarrow \rightarrow \varphi^* \uparrow$, $M \uparrow \rightarrow$ **simultaneous entries and exits**

Methodology: Empirical analysis

- **Data source:** China's transaction-level customs data & WTO Tariff Download Facility (HS06 product level)
- Trade policy environment measure: (control variables)
 - τ_h : average U.S. tariff rate of product h between 2000 and 2002
 - $d\tau_h$ = applied tariff in 2000 - applied tariff in 2002
 - gap = worst-case tariff - applied tariff $\rightarrow dgap_h$ = gap in 2000 - gap in 2002 (positive value \rightarrow less uncertainty)



Larger reduction \rightarrow Larger growth

Methodology: Empirical analysis

● Baseline results: (reallocation)

- Use China's exports to the EU as control group

- $d\ln Num_{mhct} = \sum_{j=2001}^{2006} \beta_j 1\{j = t\} 1\{c = us\} dgdp_h + \sum_{j=2001}^{2006} \delta_j 1\{j = t\} 1\{c = us\} + \sum_{j=2001}^{2006} \gamma_j 1\{j = t\} 1\{c = us\} X_h + \delta_{ht} + \varepsilon_{hct}$

$d\ln Num_{mhct}$: change in the log number of exporting firms in margin m for product h exported to destination c in year t

Trade policy uncertainty and the number of firms, difference in differences estimates: US comparison with the EU as the control group.

Dependent	Log firm number (year t)				Log firm number at year 2000 exited by year t			
	New entrants (new exporter and adders)				Exiters			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
US * dgap * 2001	0.012*** (0.001)	0.014*** (0.001)	0.013*** (0.001)	0.012*** (0.001)	0.012*** (0.001)	0.014*** (0.001)	0.012*** (0.001)	0.012*** (0.001)
US * dgap * 2002	0.015*** (0.001)	0.017*** (0.001)	0.015*** (0.001)	0.015*** (0.001)	0.012*** (0.001)	0.014*** (0.001)	0.012*** (0.001)	0.012*** (0.001)
US * dgap * 2003	0.016*** (0.001)	0.018*** (0.001)	0.016*** (0.001)	0.016*** (0.001)	0.011*** (0.001)	0.013*** (0.001)	0.012*** (0.001)	0.011*** (0.001)
US * dgap * 2004	0.017*** (0.001)	0.021*** (0.001)	0.019*** (0.001)	0.018*** (0.001)	0.012*** (0.001)	0.014*** (0.001)	0.012*** (0.001)	0.012*** (0.001)
US * dgap * 2005	0.021*** (0.001)	0.022*** (0.001)	0.020*** (0.001)	0.019*** (0.001)	0.012*** (0.001)	0.014*** (0.001)	0.012*** (0.001)	0.012*** (0.001)
US * dgap * 2006	0.020*** (0.001)	0.022*** (0.001)	0.019*** (0.001)	0.018*** (0.001)	0.012*** (0.001)	0.014*** (0.001)	0.013*** (0.001)	0.012*** (0.001)
Constant	0.244*** (0.001)	0.244*** (0.001)	0.259*** (0.001)	0.264*** (0.001)	0.169*** (0.001)	0.169*** (0.001)	0.180*** (0.001)	0.183*** (0.001)
HS 6 * year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
US * year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
X in US * year * X								
dτ	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
τ		Yes	Yes	Yes		Yes	Yes	Yes
F_asset			Yes	Yes			Yes	Yes
IM_share				Yes				Yes
N	278,446	278,446	259,476	254,968	278,446	278,446	259,476	254,968
R ²	0.738	0.738	0.747	0.749	0.724	0.725	0.734	0.736
Adj. R ²	0.738	0.738	0.747	0.749	0.724	0.725	0.734	0.736
F	6138.980**	4646.850	4083.272	3520.625	4309.669	3249.056	2689.484	2264.383

Methodology: Empirical analysis

- **Robustness check:** industry-specific/ trade-regime specific/ induced by other possible trade policy uncertainties like AD
- **Uncertainty reductions & More competitive market**

- Price

$$price_{fhc} = \alpha + \beta_1 1\{new\}_{fc} + \beta_2 1\{new\}_{fc} 1\{c = us\} + \beta_3 1\{new\}_{fc} dgap_h + \beta_4 1\{new\}_{fc} 1\{c = us\} dgap_h + \delta_{hc} + \varepsilon_{hct}$$

- Quality

$$U = \left(\int (\eta q)^{\frac{\sigma-1}{\sigma}} d\omega \right)^{\frac{\sigma}{\sigma-1}}, \text{ where } \eta \text{ is the quality of the variety}$$

$$\rightarrow \text{Demand: } q = \eta^{\sigma-1} p^{-\sigma} P^{\sigma-1} Y \rightarrow \ln q = -\sigma \ln p + \ln(P^{\sigma-1} Y) + (\sigma - 1) \ln \eta$$

$$\rightarrow \text{Regression: } \ln q_{fht} = -\sigma \ln p_{fht} + a_{ht} + u_{fht} \rightarrow \text{Use estimated residual } \eta_{fht} = e^{\hat{u}_{fht}/(\sigma-1)} \text{ to represent quality}$$

→ Use quality as dependent variable to regress again as in price

Price and quality difference between new exporters and exiters.

Dependent	Price in year t (for new exporters) or in year 2000 (for exiters)			Quality in year t (for new exporters) or in year 2000 (for exiters)		
	$t = 2002$	$t = 2004$	$t = 2006$	$t = 2002$	$t = 2004$	$t = 2006$
	(1)	(2)	(3)	(4)	(5)	(6)
New	-11.083 (70.740)	1.095 (41.401)	5.549 (28.853)	0.955*** (0.207)	0.261 (0.161)	0.972*** (0.143)
New * US	138.291 (103.393)	154.868** (61.549)	130.370*** (42.976)	-0.284 (0.303)	-0.109 (0.239)	-0.697*** (0.213)
New * $dgap$	0.246 (1.540)	-0.248 (0.888)	-0.302 (0.611)	-0.011** (0.005)	0.004 (0.003)	0.002 (0.003)
New * US * $dgap$	-4.187* (2.308)	-4.836*** (1.374)	-4.080*** (0.955)	0.009 (0.007)	0.003 (0.005)	0.013*** (0.005)
Constant	28.624 (27.928)	34.185** (16.571)	32.229*** (11.667)	50.773*** (0.082)	50.674*** (0.064)	50.154*** (0.058)
Prod * Cty FE	Yes	Yes	Yes	Yes	Yes	Yes
N	260,387	441,467	732,152	260,387	441,467	732,152
R^2	0.059	0.021	0.014	0.166	0.158	0.154
Adj. R^2	0.037	0.008	0.006	0.147	0.147	0.147
F	2.028	6.259	8.880	90.863	297.128	675.937

Conclusion & Future studies

- **Conclusion**

- **Reallocation effect:** simultaneous entries and exits
- **More competitive market:** lower prices & improved productivity

- **Future studies**

- other firm-level characteristics
- multi-product firms' responses