TECHNO-INDUSTRIAL FDI POLICY AND CHINA'S EXPORT SURGE

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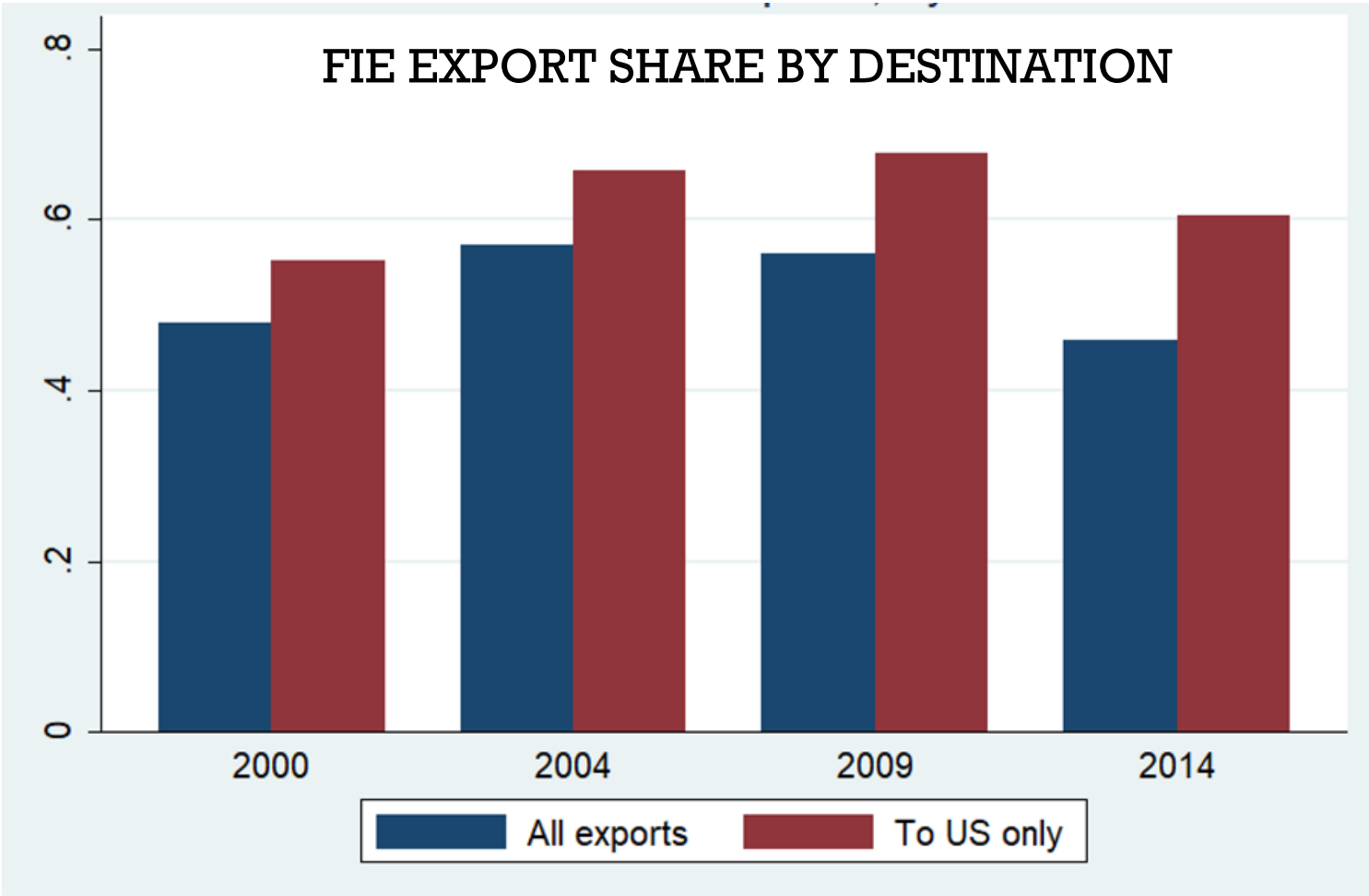
BACKGROUND: CHINA'S EXPORT SURGE

China's exports surged, rising from $57 billion in 2001 to $250 billion by 2008.

This export growth was highly concentrated by industry.

Exports surged in sectors where foreign invested enterprises account for a large share of exports. Electronics has a share over 70%.

DESPITE RESTRICTIONS, FIES PROVIDE A LARGE SHARE OF CHINA'S EXPORTS



IS CHINESE FDI REGULATION DIFFERENT?

- Chinese policy not different in form from other developing countries, but relatively restrictive due to ownership limits.
- WTO members agree not to impose trade-related investment measures.
- China agreed in its accession not to condition investment approval on tech transfer.

➢ **A big difference is size and use: China receives larger FDI inflows and exports more from FIEs.**

GUIDELINES CATEGORIZE SECTORS BY OPENNESS TO INVESTMENT

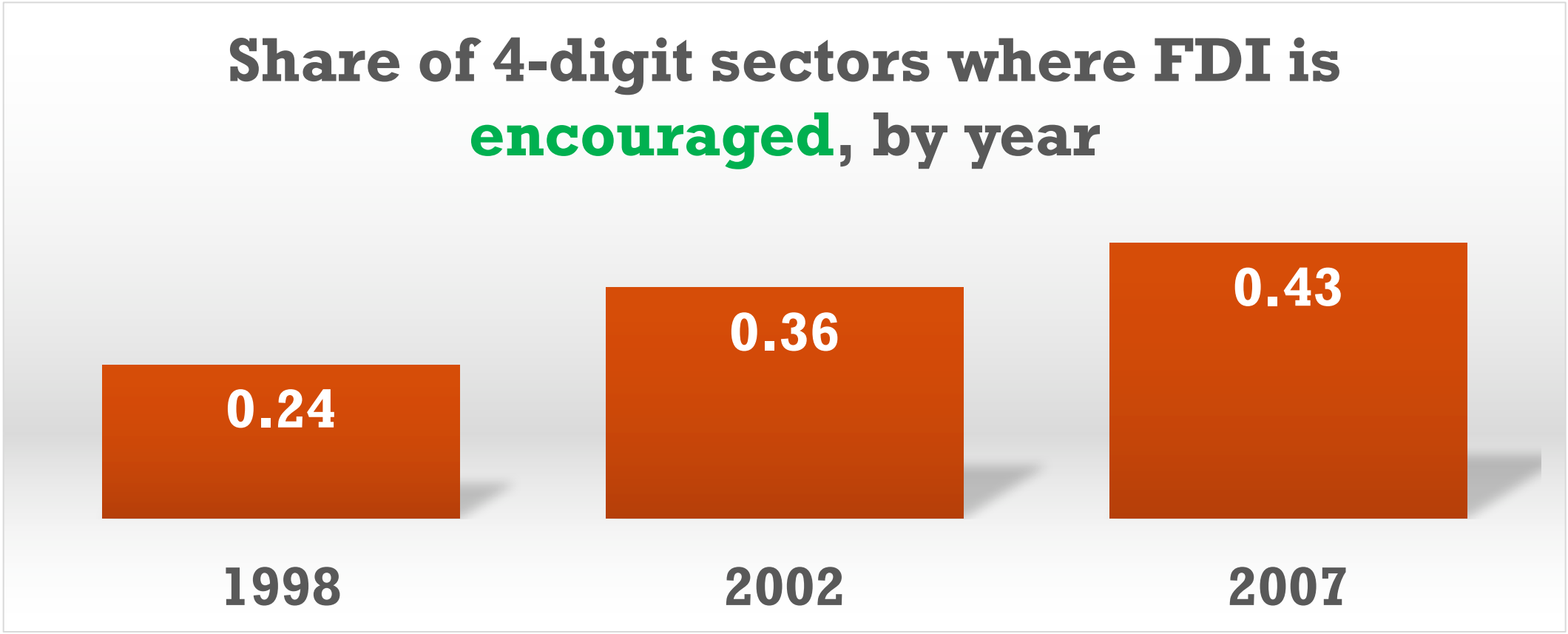
- Forbidden: no foreign investment permitted.
- Restricted: investment by permission and only as minority shareholder in a joint venture.
- Encouraged: preferences available on a deal-by-deal basis.
- Investment in all other industries is **allowed**, with no ownership restrictions, subject to approval.

WHAT DO WE EXPECT POLICY TO DO?

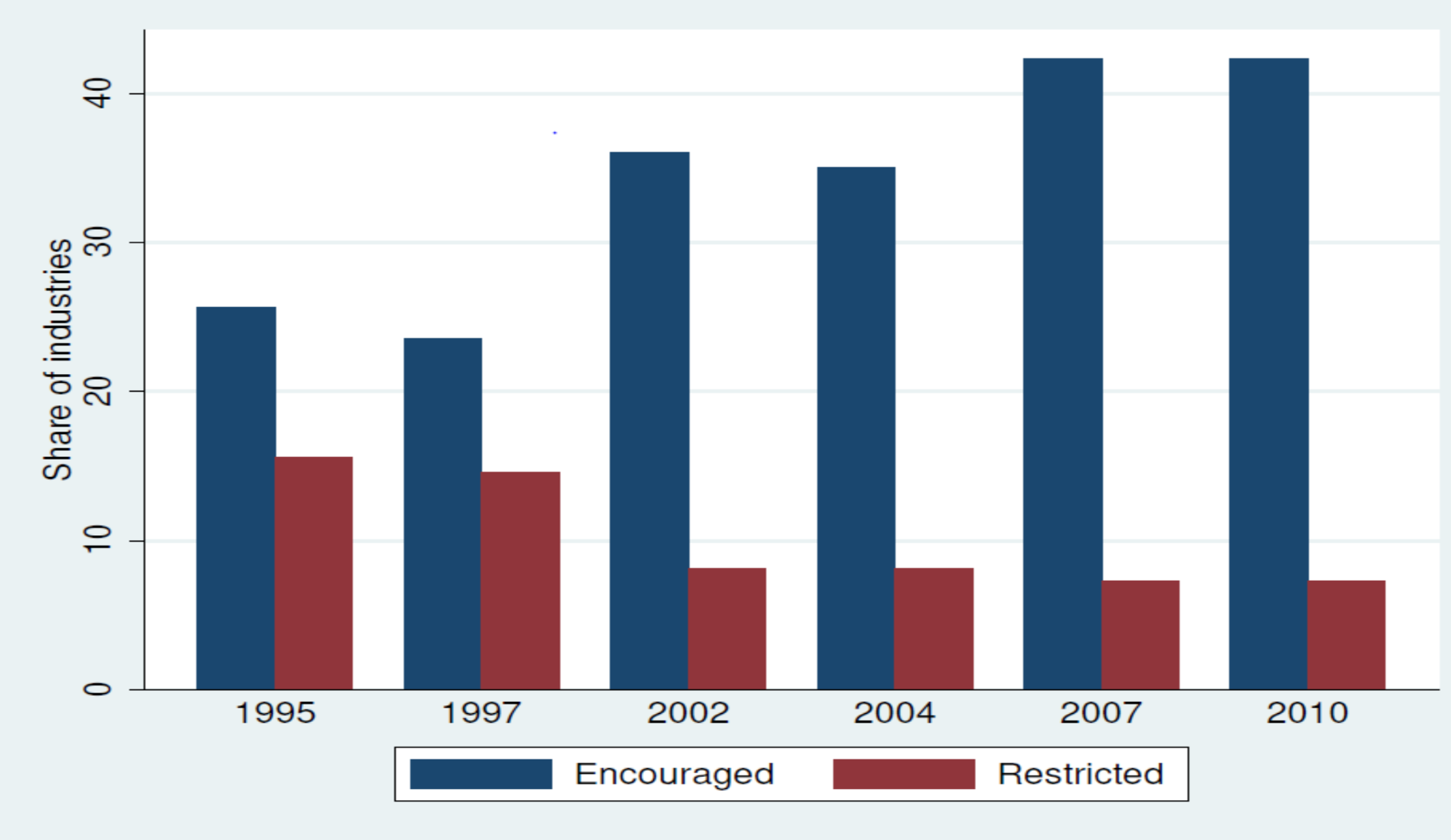
- Encouraging policies are deal specific, but they lower fixed costs of foreign entry raising number of such firms and exports.
- Restricted sectors are closed to wholly owned foreign investment, so this policy should reduce entry and exports by wholly owned foreign enterprise.

IS FDI ENCOURAGED OFTEN?

(DATA SOURCE: SHENG & YANG, 2016)

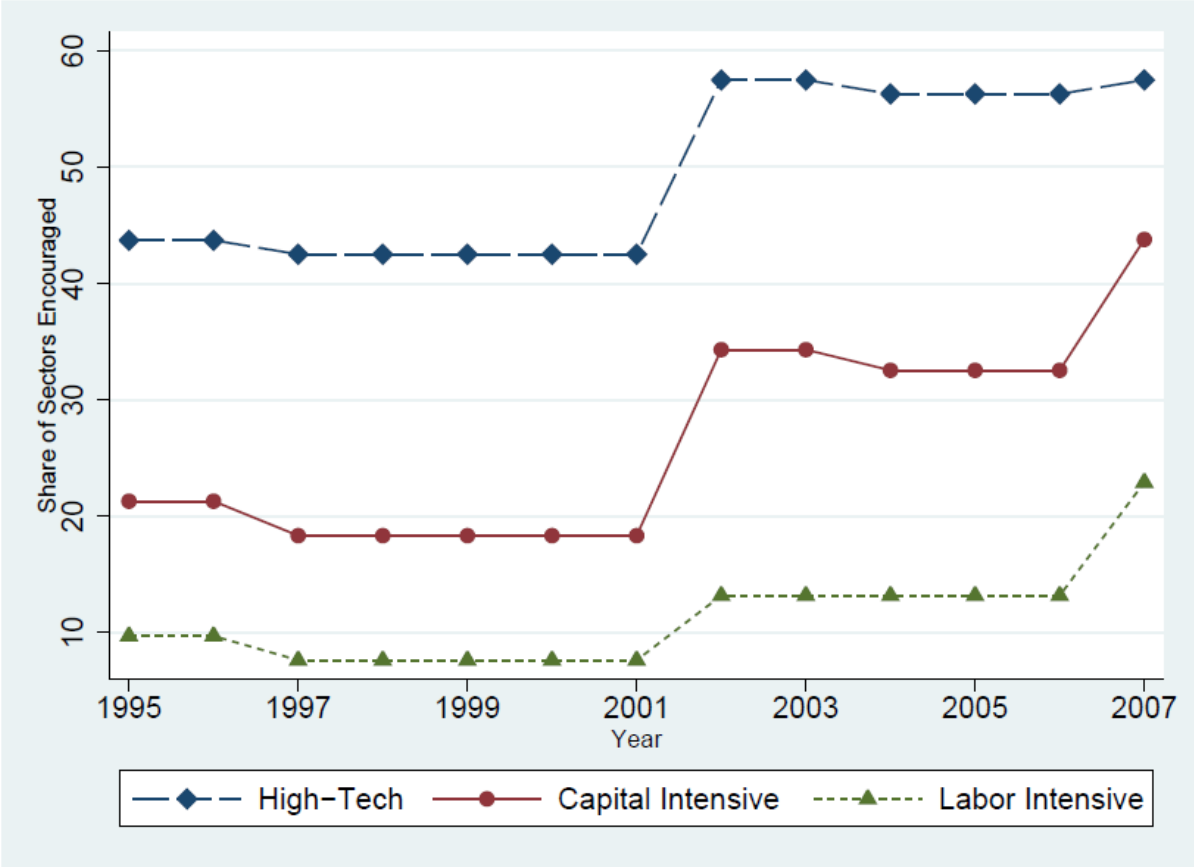


BY 2007, FDI IN 43% OF SECTORS ENCOURAGED



SHARE OF SECTORS THAT ARE ENCOURAGED

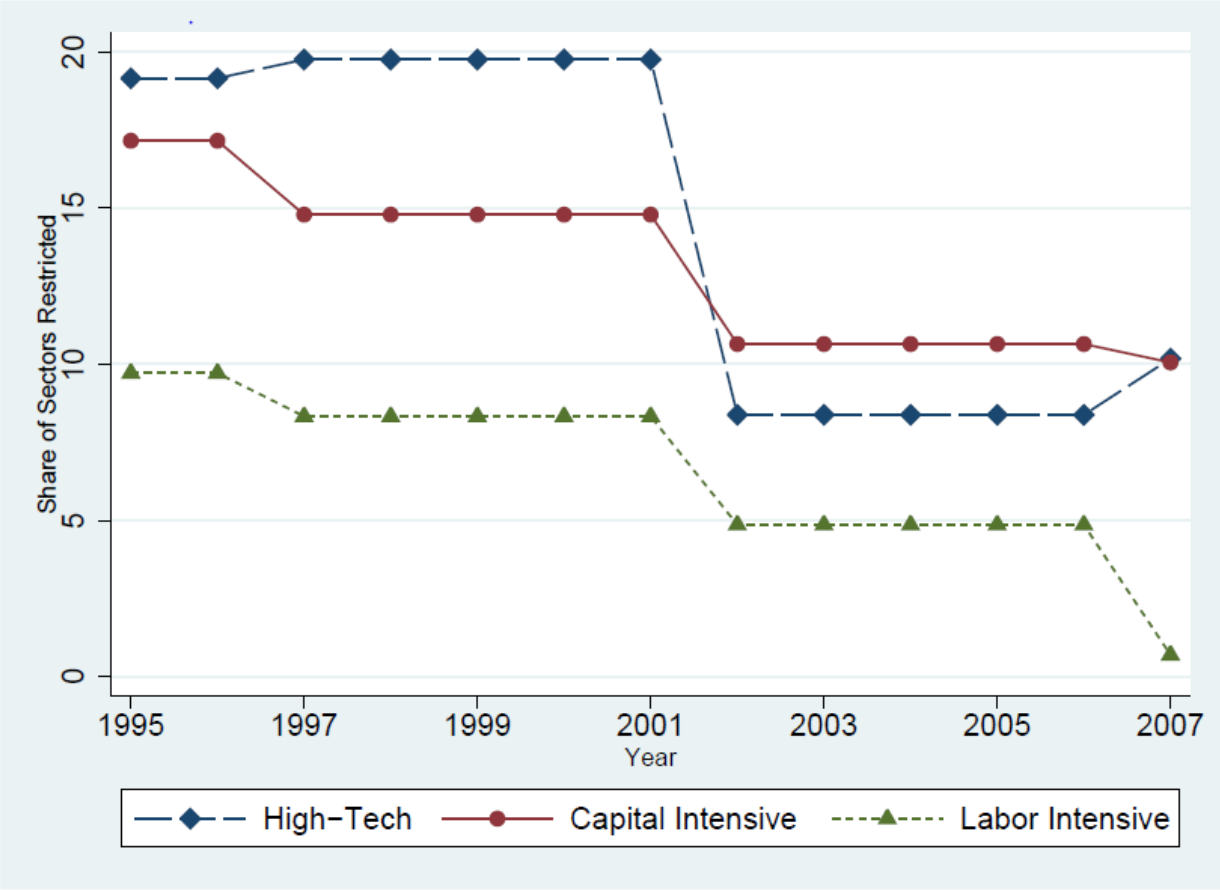
Share of Sectors Designated Encouraged, by Group, 1995-2007



(a) Encouraged

SHARE OF SECTORS THAT ARE RESTRICTED

Share of Sectors Designated Restricted, by Group, 1995-2007



(a) Restricted

WHICH INDUSTRIES ARE DESIGNATED AS HIGH TECH? (SOME EXAMPLES)

- Chemicals
- Medical and pharmaceutical products
- Special equipment manufacturing
- Communications, computers, other electronics
- Instruments, meters, office machinery

RESEARCH QUESTIONS AND METHODS

1. Does foreign investment activity change when a sector is Encouraged or Restricted?

   Compare before-and-after activity in "treated" industries to those with no policy change.

2. Can we account for possible policy endogeneity?

   Compare foreign to domestic activity over time, for treated and not treated industries.

3. Is activity being driven by other factors?

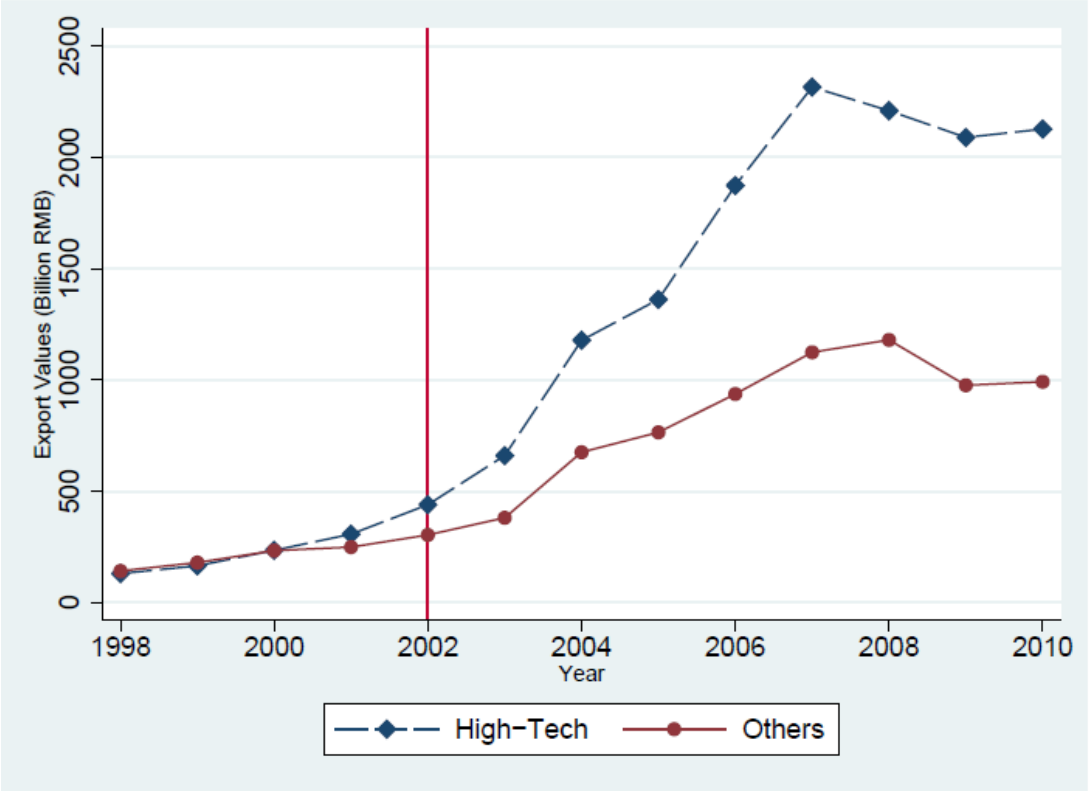
   Add controls for other trade policy changes.

WHICH ACTIVITIES DO WE EXPECT TO BE INFLUENCED BY FDI POLICY?

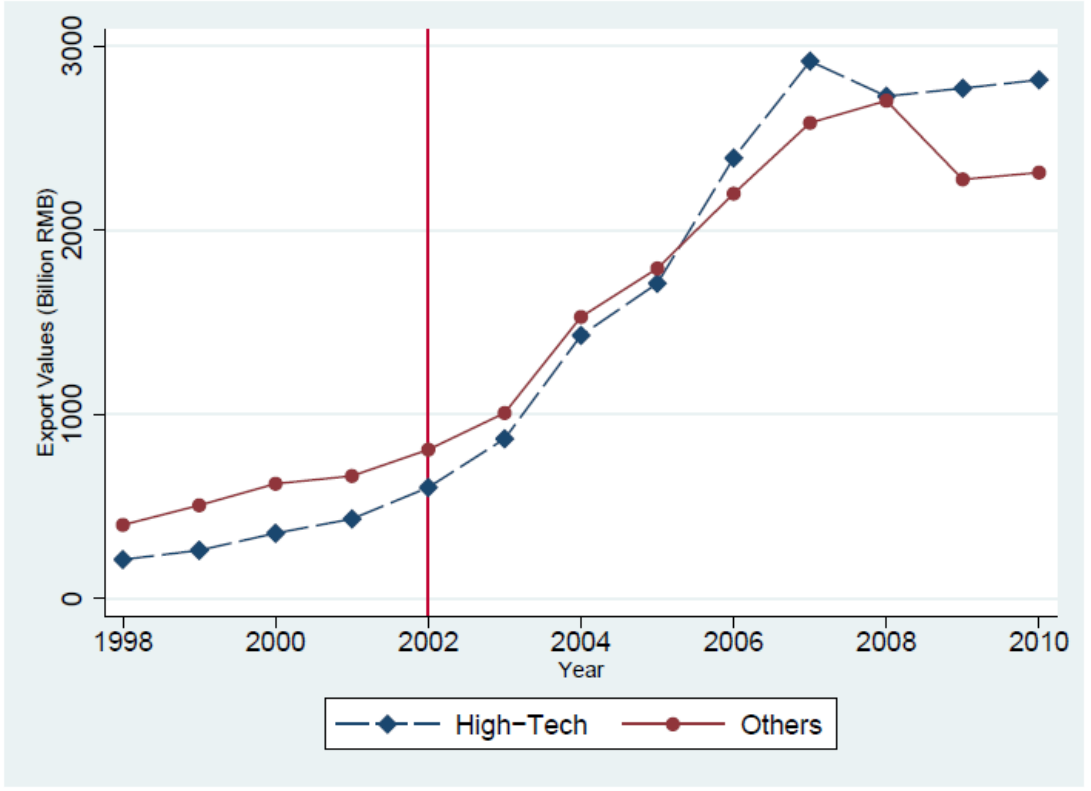
- Entry of new foreign enterprises into China
- Entry of foreign enterprises into exporting
- Export volume of foreign firms
- Other aspects of exporting (work in progress)
  - Intensity of existing relationships
  - Export of new products to new destinations
  - Exports to the United States only

EXPORT GROWTH OF HIGH-TECH AND OTHER SECTORS

(a) Foreign Enterprises



(b) Domestic Enterprises



WHAT DATA DO WE USE?

Chinese manufacturing firm census, 1998-2010

- Omits the smallest firms
- Provides number of firms, ownership, export value

Chinese Customs Records, 2000-2010

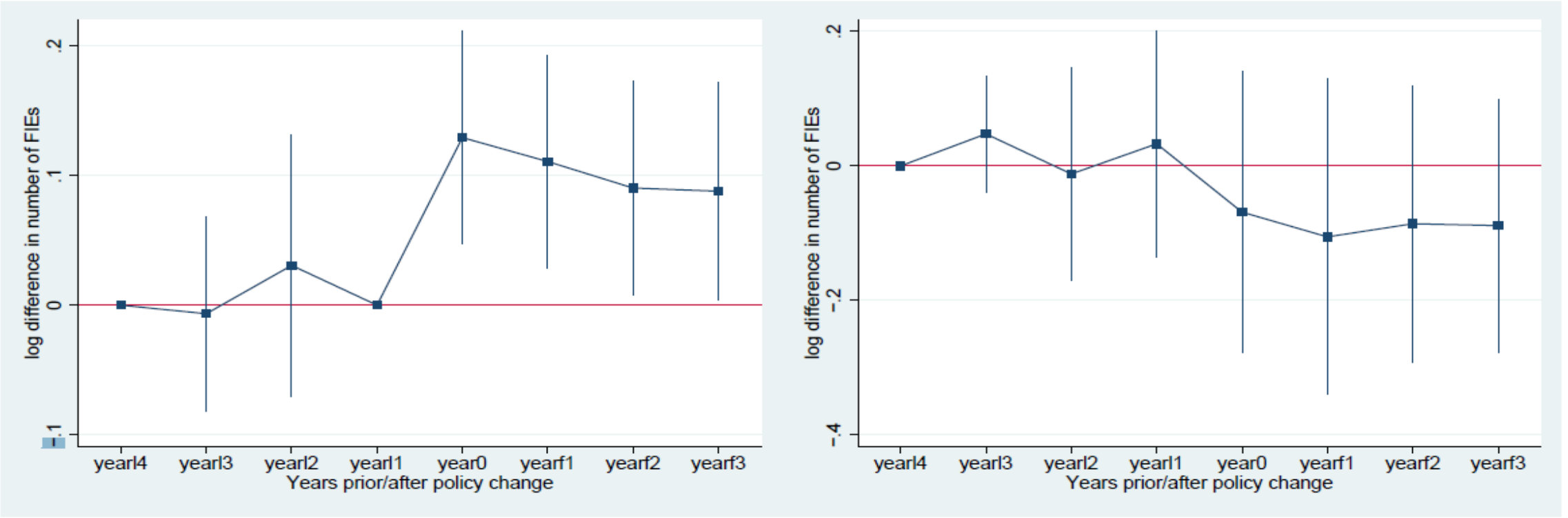
- Universe of exports
- Provides information on ownership type
- Provides product and destination information

- Sheng and Yang (2016) - policy designations

SOME PICTURES OF EFFECTS, USING EVENT STUDY METHODS

$$\ln Y_{jt} = \alpha + \sum_{t=-3}^{4} \beta_{1t} Encouraged_{jt} + \sum_{t=-3}^{4} \beta_{2t} Restricted_{jt} + \mu_j + \eta_t + \epsilon_{jt}$$

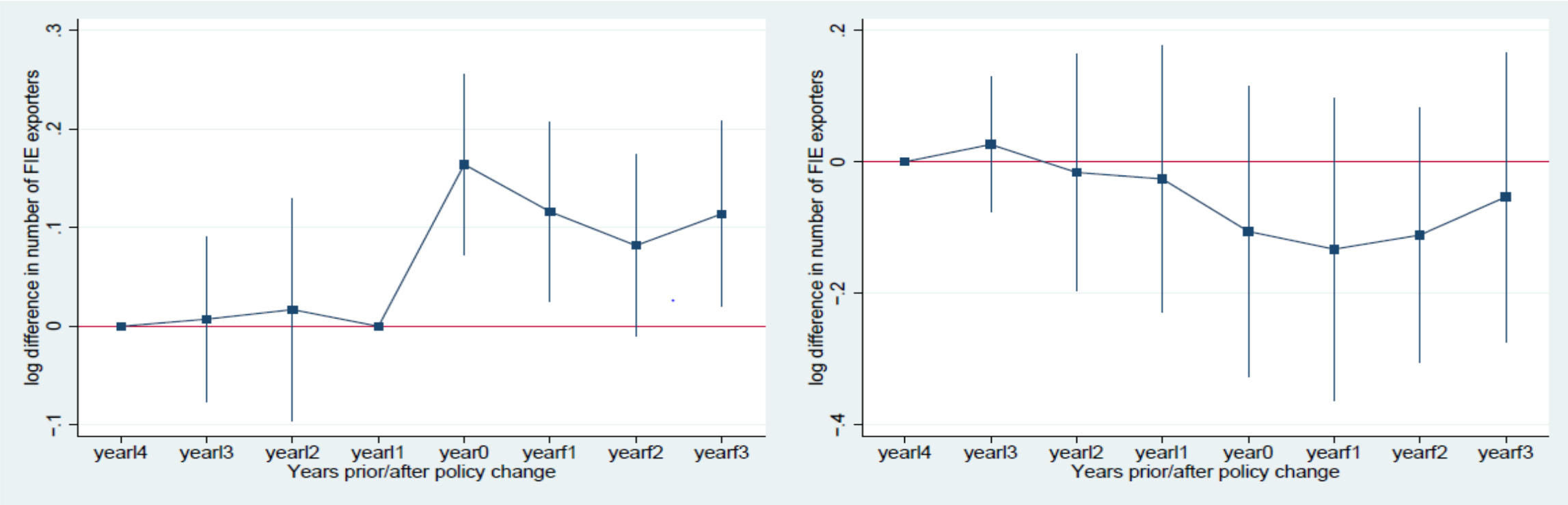
NUMBER OF FOREIGN FIRMS, TREATED V. NOT TREATED INDUSTRIES



(a) Encouraged

(b) Restricted

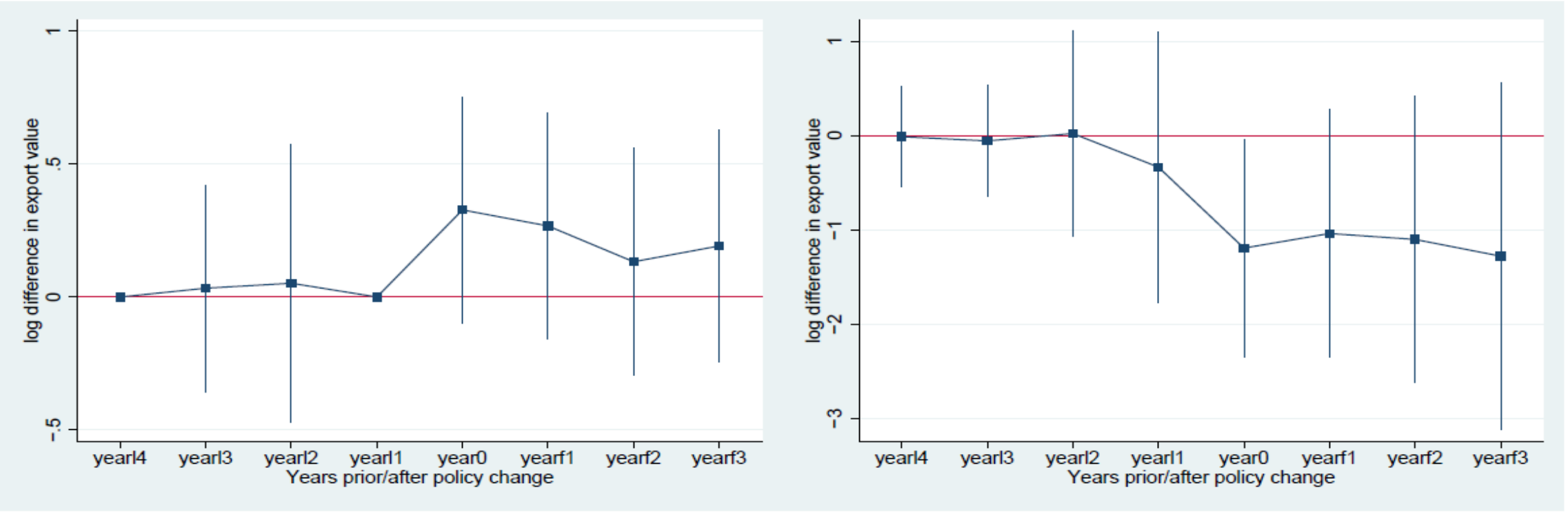
NUMBER OF FOREIGN EXPORTERS, TREATED V. NOT TREATED INDUSTRIES



(a) Encouraged

(b) Restricted

FIE EXPORT VALUES, TREATED V. NOT TREATED INDUSTRIES



(a) Encouraged

(b) Restricted

DIFFERENCE-IN-DIFFERENCES

- $\ln Y_{jt} = \alpha + \beta_1 Encouraged_{jt} + \beta_2 Restricted_{jt} + \mu_j + \eta_t + \epsilon_{jt}$
- j = industry, t = year
- Encouraged = 1 if industry j contains encouraged items in the FDI catalogue
- Restricted = 1 if industry j contains restricted items in the FDI catalogue
- μ_j, η_t are industry and year fixed effects

Regression DD Estimates of FDI Policy Effects

	(1) FIE	(2) JV	(3) WOFE	(4) Domestic
(Panel A: Depvar = ln Number of Firms)				
Encouraged	0.141***	0.142***	0.102**	0.077
	(0.044)	(0.042)	(0.046)	(0.059)
Restricted	-0.005	0.029	-0.147**	-0.034
	(0.045)	(0.039)	(0.067)	(0.062)
(Panel B: Depvar = ln Number of Exporters)				
Encouraged	0.153***	0.138***	0.101*	0.021
	(0.047)	(0.041)	(0.055)	(0.069)
Restricted	-0.047	0.024	-0.197**	0.000
	(0.049)	(0.042)	(0.074)	(0.065)
(Panel C: Depvar = ln Export Values)				
Encouraged	0.357**	0.382*	0.261	-0.171
	(0.141)	(0.177)	(0.185)	(0.123)
Restricted	0.173	0.207	-0.493	0.195*
	(0.153)	(0.195)	(0.329)	(0.104)
Observations	5615	5483	5194	5425

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TRIPLE DIFFERENCING: DOMESTIC FIRMS AS CONTROLS

$$logY_{ijt} = \alpha + \beta_1 Encouraged_{jt} \times FIE_i + \beta_2 Restricted_{jt} \times FIE_i + \gamma_1 Encouraged_{jt} + \gamma_2 Restricted_{jt} + FIE_i \times \mu_j + FIE_i \times \eta_t + \mu_j + \eta_t + \epsilon_{jt}$$

- j = industry, t = year
- Encouraged = 1 if industry j contains encouraged item in the FDI catalogue
- Restricted = 1 if industry j contains restricted item
- μ_j, η_t are industry and year fixed effects
- FIE =1 if outcome variable refers to foreign-invested enterprises in industry j

Regression DDD Estimates of FDI Policy Effects

	(1) FIE	(2) JV	(3) WOFE
(Panel A: Depvar = ln Number of Firms)			
DDD Enc	0.115***	0.116***	0.076*
	(0.028)	(0.031)	(0.036)
DDD Res	0.015	0.049	-0.127**
	(0.044)	(0.045)	(0.052)
(Panel B: Depvar = ln Number of Exporters)			
DDD Enc	0.180***	0.165***	0.128***
	(0.039)	(0.040)	(0.041)
DDD Res	-0.024	0.048	-0.173**
	(0.056)	(0.056)	(0.058)
(Panel C: Depvar = ln Export Values)			
DDD Enc	0.224**	0.341***	0.323**
	(0.109)	(0.118)	(0.130)
DDD Res	0.156	0.241	-0.095
	(0.159)	(0.174)	(0.201)
Observations	16892	16760	16471

FINDINGS: ENCOURAGED INVESTMENT

- Raises the number of foreign enterprises by **14%**
- Raises the number of foreign exporters by **15%**
- Raises the value of exports from foreign-invested enterprises by **36%**
- FDI promotion policies have no effect on domestic enterprises.

FINDINGS: REMOVING RESTRICTIONS

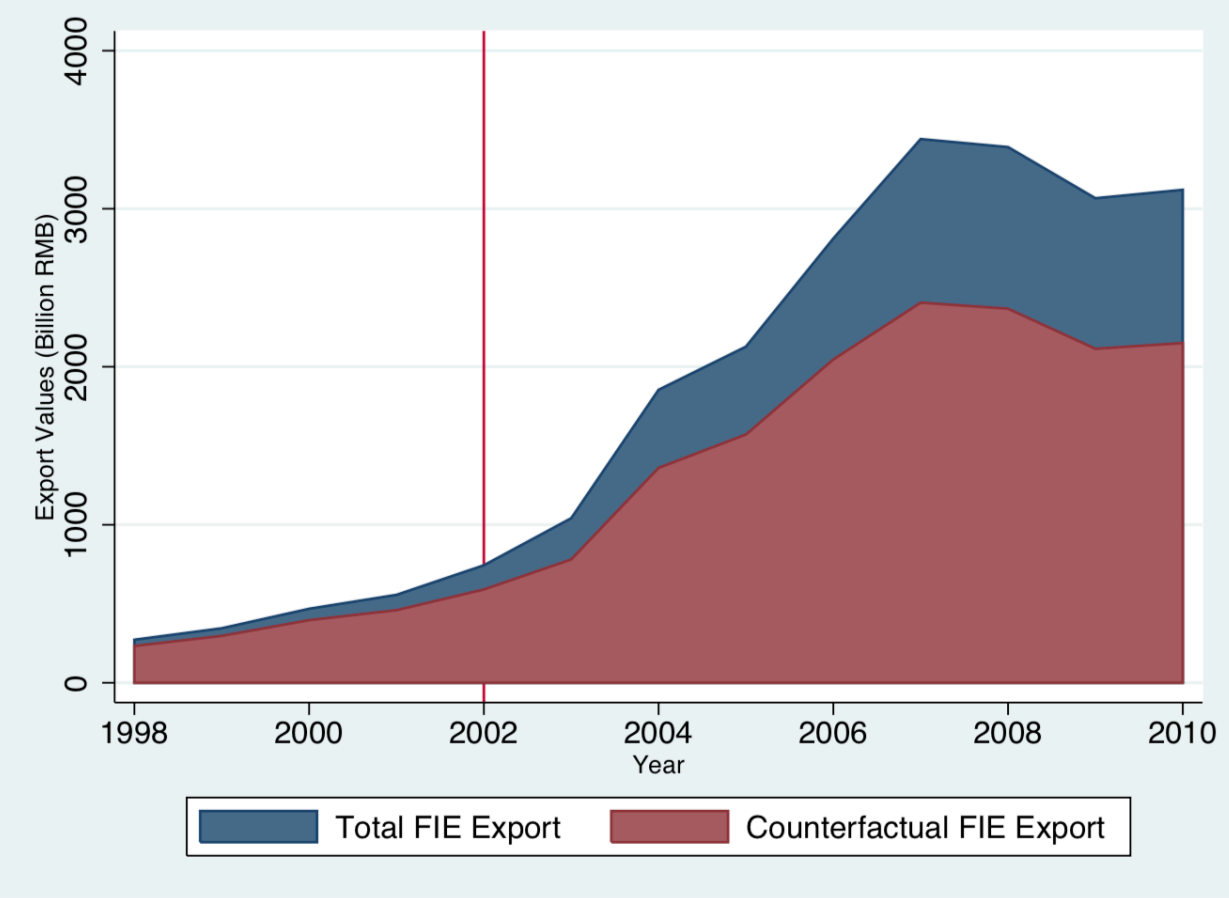
- Restrictions limiting wholly owned foreign firms reduce the number of such firms by **15%**.
- Does not affect the value of exports from WFOEs.
- Has no significant effect on activity of joint ventures.

MAGNITUDES: COUNTERFACTUALS

- Use the regression coefficients and actual trade flows to calculate predicted exported values in absence of encouragement.

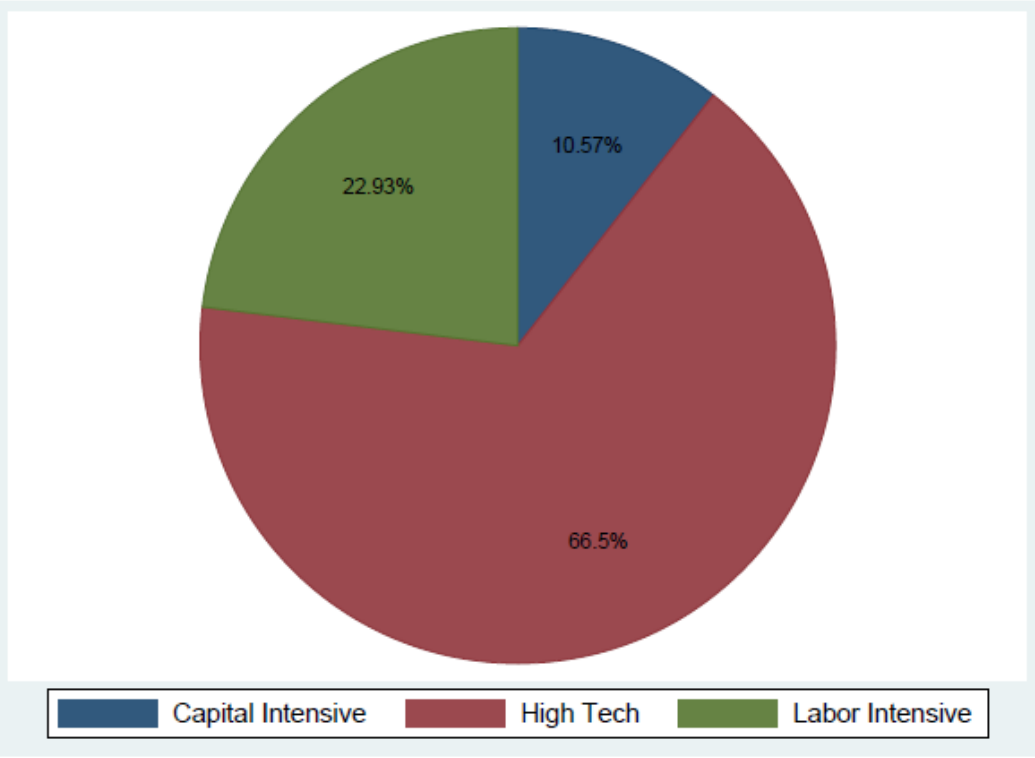
- $\Delta Export_t = \sum_j X_{jt} \cdot (e^{\beta_1 \cdot 1\{Encouraged_{jt}\}} - 1)$

FIE EXPORT COUNTERFACTUAL, ACTUAL VS. WITHOUT ENCOURAGEMENT

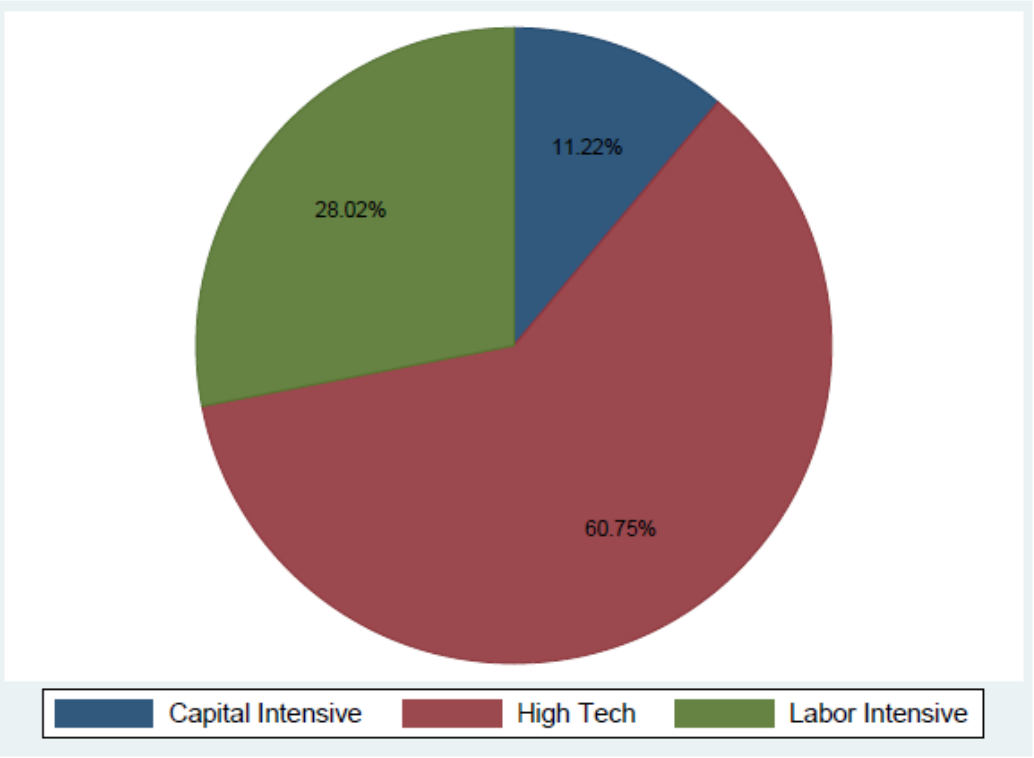


Source: Source of export data is the ASIP.

EXPORT COMPOSITION IN 2010, ACTUAL AND COUNTERFACTUAL



(a) Actual



(b) Counterfactual

Source: Source of export data is the ASIP. Grouping and calculations by authors.

DOES IT MATTER? (1: US-CHINA CONFLICT)

- Forced technology transfer is a major complaint against China by USA and others.
- How much of the "encouraging" is a quid pro quo?
- Policy responses restrict trade and investment:
  - ✓Section 301 investigation – tariffs? Restrictions?
  - ✓expanded CFIUS review of Chinese investments into US and review of outward investment by US companies.

DOES IT MATTER? (2: TRADE RULES)

- Industrial policy increasingly focused on high tech sectors: Made in China 2025 and Make in India
- FDI regulation only one policy that influences capital flows and trade - subsidies, procurement, NTBs, antitrust
- Clashing views on legitimacy of "sovereign" policy Hyper-globalization or unfair practices?
- WTO agreements cover limited aspects of how investment policies influence trade flows.

COMMENTS WELCOME!

Table 2: Linear Probability Models of Policy Designations

	(1) Encouraged	(2) Encouraged	(3) Restricted	(4) Restricted
Capital-Labor Ratio (1998)	0.000	0.000	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
High-Tech Dummy	0.297***	0.293***	0.046	0.034
	(0.070)	(0.067)	(0.029)	(0.032)
SOE Output Share	0.055	0.005	0.016	0.009
	(0.124)	(0.134)	(0.065)	(0.069)
COD Intensity		0.001		-0.000
		(0.002)		(0.001)
SO2 Intensity		0.011		-0.005
		(0.009)		(0.004)
Observations	6182	5770	6182	5770
Year FE	Yes	Yes	Yes	Yes

Note: Dependent variables are policy designations for CIC four-digit sectors from Sheng and Yang (2016). Other data sources described in text. Pooled observations, 1995-2007. Robustness standard errors in parentheses are two-way clustered at the industry and year level. * $p < .10$, ** $p < .05$, *** $p < .01$

Table 1: Regression DD Estimates of FDI Policy Effects W/O Sector 40

	(1) FIE	(2) JV	(3) WOFE	(4) Domestic
(Panel A: Depvar = ln Number of Firms)				
Encouraged	0.165***	0.136***	0.122*	0.055
	(0.049)	(0.041)	(0.057)	(0.071)
Restricted	-0.070	-0.011	-0.184**	-0.003
	(0.054)	(0.045)	(0.076)	(0.072)
(Panel B: Depvar = ln Number of Exporters)				
Encouraged	0.151***	0.140***	0.120**	0.100
	(0.045)	(0.042)	(0.046)	(0.060)
Restricted	-0.028	-0.006	-0.141*	-0.064
	(0.047)	(0.038)	(0.072)	(0.068)
(Panel C: Depvar = ln Export Values)				
Encouraged	0.385**	0.413**	0.284	-0.133
	(0.147)	(0.179)	(0.193)	(0.135)
Restricted	0.147	0.151	-0.327	0.138
	(0.167)	(0.211)	(0.308)	(0.111)
Observations	5379	5248	4962	5190

Note: Table reports results of OLS generalized difference-in-differences (DD) regressions. Dependent variables are log of indicated quantities in four-digit CIC industry j in year t. Independent variables representing Chinese FDI policy are dummies indicating whether a certain industry is encouraged, restricted, or not. All regressions include industry and year fixed effects. Clustered robust standard errors in parentheses. Source of export data is the ASIP. * $p < .10$, ** $p < .05$, *** $p < .01$

DD Regressions with Controls

	ln Num of Firms			ln Num of Exporters			ln Export Values		
	(1) FIE	(2) JV	(3) WOFE	(4) FIE	(5) JV	(6) WOFE	(7) FIE	(8) JV	(9) WOFE
Encouraged	0.139**	0.133***	0.099*	0.153**	0.131***	0.098	0.349**	0.367*	0.098
	(0.047)	(0.041)	(0.054)	(0.051)	(0.039)	(0.062)	(0.125)	(0.175)	(0.092)
Restricted	-0.033	0.004	-0.183**	-0.067	0.013	-0.230**	0.198	0.229	-0.264*
	(0.043)	(0.039)	(0.070)	(0.050)	(0.045)	(0.082)	(0.163)	(0.185)	(0.137)
NTR Gap	0.730***	0.622***	0.594***	0.850***	0.720***	0.767***	-0.515	0.534	0.130
	(0.184)	(0.156)	(0.188)	(0.209)	(0.175)	(0.191)	(0.695)	(0.676)	(0.416)
ln Output Tariff	0.013	0.122***	-0.007	-0.016	0.119**	-0.047	-0.239*	0.126	-0.239
	(0.034)	(0.033)	(0.045)	(0.041)	(0.049)	(0.048)	(0.126)	(0.268)	(0.136)
Non-Tariff Barriers	0.255**	0.168**	0.301**	0.181*	0.033	0.270*	-0.379	-0.421*	0.449
	(0.096)	(0.063)	(0.125)	(0.098)	(0.081)	(0.146)	(0.404)	(0.223)	(0.337)

MADE IN CHINA 2025 BIG CHANGE FROM STRATEGIC EMERGING INDUSTRIES POLICY

Although the goal is to upgrade industry writ large, the plan highlights 10 priority sectors: 1) New advanced information technology; 2) Automated machine tools & robotics; 3) Aerospace and aeronautical equipment; 4) Maritime equipment and high-tech shipping; 5) Modern rail transport equipment; 6) New-energy vehicles and equipment; 7) Power equipment; 8) Agricultural equipment; 9) New materials; and 10) Biopharma and advanced medical products.

US-CHINA TRADE FLOWS ARE IMPORTANT

- U.S. goods and services trade with China totaled an estimated $648.2 billion in 2016. Exports were $169.3 billion; imports were $478.9 billion. The U.S. goods and services trade deficit with China was $309.6 billion in 2016.
- China is currently our largest goods trading partner with $578.6 billion in total (two way) goods trade during 2016. Goods exports totaled $115.8 billion; goods imports totaled $462.8 billion. The U.S. goods trade deficit with China was $347.0 billion in 2016.
- Trade in services with China (exports and imports) totaled an estimated $69.6 billion in 2016. Services exports were $53.5 billion; services imports were $16.1 billion. The U.S. services trade surplus with China was $37.4 billion in 2016.
- According to the Department of Commerce, U.S. exports of goods and services to China supported an estimated 911 thousand jobs in 2015 (latest data available) (601 thousand supported by goods exports and 309 thousand supported by services exports.

IS THIS DIFFERENT FROM JAPAN-US TRADE CONFLICT IN THE 1980S?

There are similarities…

- Use of industrial policies for development
- Push into higher tech products and global brand status
- Global trading system unable to mediate bilateral conflict

…but also very important differences

- Japan was politically tied to the US;
- Japanese MNCs global before American firms;
- China is a very large market;
- Chinese policy similar to German and Japanese policies

Diff-in-Diff Industry-Level Regression Results, Depvar = ln Industrial Output

	(1) FIE	(2) JV	(3) WOFE	(4) Domestic
Encouraged	0.241***	0.289***	0.169***	0.028
	(0.040)	(0.048)	(0.063)	(0.036)
Restricted	-0.068	-0.062	-0.357***	0.020
	(0.061)	(0.072)	(0.095)	(0.055)
Observations	3184	3184	3184	3184

Robustness standard errors in parentheses are two-way clustered at the industry-five year plan and year level

* $p < .10$, ** $p < .05$, *** $p < .01$

TABLE: DD REGRESSIONS, INTERACTING FDI POLICY VARIABLES WITH NTR GAP

	ln Num of Firms			ln Num of Exporters			ln Export Values		
	(1) FIE	(2) JV	(3) WOFE	(4) FIE	(5) JV	(6) WOFE	(7) FIE	(8) JV	(9) WOFE
Encouraged	0.206**	0.151**	0.099	0.214**	0.142*	0.083	0.609**	0.302	0.860
	(0.068)	(0.065)	(0.066)	(0.084)	(0.066)	(0.089)	(0.239)	(0.325)	(0.595)
Restricted	0.230*	0.174	0.042	0.239**	0.183**	0.046	0.537	0.411	0.309
	(0.116)	(0.119)	(0.111)	(0.093)	(0.065)	(0.142)	(0.336)	(0.341)	(0.898)
Encouraged × NTR	-0.232	-0.062	-0.009	-0.206	-0.036	0.048	-0.863	0.234	-2.092
	(0.182)	(0.172)	(0.184)	(0.220)	(0.170)	(0.204)	(0.574)	(0.839)	(1.552)
Restricted × NTR	-0.859*	-0.553	-0.706	-1.031**	-0.593**	-0.900	-1.299	-0.768	-2.743
	(0.423)	(0.383)	(0.500)	(0.402)	(0.262)	(0.662)	(1.024)	(1.373)	(3.695)
NTR Gap	0.795***	0.655***	0.616***	0.894***	0.722***	0.774***	-0.512	0.406	-2.552***
	(0.194)	(0.166)	(0.196)	(0.214)	(0.179)	(0.202)	(0.636)	(0.688)	(0.736)
ln Input Tariff	0.519**	0.300	0.769***	0.460**	0.157	0.891***	1.035	0.254	2.012*
	(0.181)	(0.208)	(0.195)	(0.200)	(0.204)	(0.223)	(0.681)	(0.875)	(0.932)
ln Output Tariff	0.008	0.119***	-0.010	-0.019	0.119**	-0.049	-0.236*	0.137	-0.438**
	(0.034)	(0.032)	(0.045)	(0.040)	(0.049)	(0.048)	(0.124)	(0.267)	(0.199)
Observations	5615	5483	5194	5615	5483	5194	5615	5483	5194