Techno-industrial FDI Policy and China's Export Surge

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Abstract

Researchers emphasize productivity growth of China's domestic enterprises as well as the granting of permanent trade relations as causes of China's export surge to the U.S. after 2000. Less well understood is the role of Chinese industrial policy as embodied in its regulation of foreign direct investment, which encourages development of high-technology industries. This gap is troubling, since about half of Chinese exports between 2000 and 2008 originated in foreign-owned enterprises. This paper uses a quasi-natural-experiment approach to assess the effect of changes in Chinese foreign investment policies in 2002, 2004, and 2007 on Chinese exports. Our differences-in-differences analysis strongly supports the view that Chinese FDI policies are effective in promoting exports. We find that favorable treatment of foreign investment in a particular sector promotes entry of foreign firms that export, and that it raises export values in the targeted industry. Results from triple-differenced analysis show that foreign-owned exporters increase in number when such investment is encouraged and that these firms increase the value of their exports relative to their domestic peers. Using detailed China Customs data, we find that preferential treatment of an industry increases its exports at both the intensive and extensive margin and is particularly effective in raising exports to the U.S. Overall, we estimate that changes in FDI policy explain almost one-quarter of China's export surge and shifted China's export composition toward high-technology industries. These results are relevant for current discussion of how China uses investment policy to shape its international competitiveness.
JEL Classifications: *F14*

1 Introduction

Following its accession to the World Trade Organization, China's exports surged, rising from $57 billion in 2001 to $250 billion by 2008.[1] In industrial sectors where Chinese market share soared, importing countries experienced the disruption of geographically concentrated job losses. In the United States, net imports from China grew especially quickly and manufacturing employment, which had declined steadily for 20 years, fell by 18% between March 2001 and March 2007 (Pierce and Schott, 2016). Although other factors clearly contributed to these losses, competition from China was a particularly salient explanation for manufacturing job losses in America.[2]

Explanations for the rapid growth in Chinese exports vary. Autor et al. (2013) emphasize productivity growth of Chinese domestic firms as a key driver of export growth to the US. The dynamic nature of China's manufacturing sector and sustained growth in total factor productivity are confirmed by Brandt et al. (2012). Other researchers emphasize the resolution of trade policy uncertainty stemming from the granting to China of permanent normal trade relations (PNTR) by the US. Handley and Limao (2015) relate the resolution of policy uncertainty directly to Chinese export growth at the product level, while Feng et al. (2017) document the simultaneous entry and exit of exporters to the US, as well as improvements in their product quality.

Each of these explanations provides important insights, and each has empirical support.[3] Because it is a large and complex phenomenon, China's export surge was, in all likelihood, propelled by simultaneous shocks to Chinese supply, trade policies, and multinational supply chains. What is missing from this rich menu of explanations, however, is an active role for Chinese industrial policy in midwifing the export surge. Rather than influencing its export profile solely through market reforms and reductions in trade barriers, throughout the decade following its WTO accession China's foreign investment policies promoted export upgrading and the development of high-technology capabilities. China's leadership initially directed foreign investment to sectors that would spur exports and provide foreign exchange earnings, but gradually transitioned to promoting investment

[1] Enright (2017, p.38) reports that in 2013 FIEs accounted for 47% of China's exports, indicating that their importance for China's trade relations has not diminished in the aftermath of the Great Recession.

[2] A cottage industry has developed attributing various American social ills to China's export surge. These papers are cited in numerous newspaper articles and blog posts (see https://www.nytimes.com/2014/04/02/opinion/edsall-is-the-american-middle-class-losing-out-to-china-and-india.html for a prominent example) and some of the most well-cited are collected at the popular website http://chinashock.info

[3] In addition to the studies cited above, see Ebenstein et al. (2014), which considers trade and offshoring.

in sectors that would further industrial development (Enright, 2016). These policy directions were made clear in 2007, when China's guidance to foreign investors included special efforts to attract investors in hundreds of advanced sectors. [4]

Chen and Naughton (2016) define techno-industrial policy as direct government intervention to promote high-technology industries and to upgrade traditional sectors. While Chen and Naughton (2016) document the post-WTO-accession planning of technology-related magaprojects, our attention is focused on how China shaped its export performance through the regulation of foreign investment. Our primary goal is to identify the effect of changes in FDI policy on the number, exporting status, and export volumes of foreign-invested enterprises (FIEs) operating in China. Given that during the decade ending in 2010, foreign enterprises accounted for more than half of all Chinese exports (with a high of 58% reached in 2005 and 2006), changes in the treatment of foreign investment is a potentially important explanation for the export surge of the period.[5]

China's unilateral revisions of its foreign investment policies in 1997, 2002, and 2007 provide an opportunity to assess the impact of these regulatory changes on the presence and performance of foreign enterprises operating in China. Our differences-in-differences analysis strongly supports the view that Chinese preferential FDI policies were effective in shaping and promoting exports. We find that favorable treatment of foreign investment in a particular sector promotes entry of foreign firms that export and raises export values in the targeted industry. We triple difference the data to guard against our results being driven by general export promotion policies or changes in China's comparative advantage that impact an entire sector. Our results show a significantly different effect of FDI policy changes on foreign-owned firms in sectors that receive favorable treatment, relative to domestic peers in the same sector. Indeed, our reduced-form calculations imply that these policies explain at least 14% of the increase in Chinese exports over the decade. These findings indicate the efficacy of Chinese FDI policy in attracting foreign exporters, raising Chinese export volumes, and shifting China's export profile toward high-technology sectors.

The differencing method we use are common to the literature, and we draw upon an extraor-

[4] Chinese industrial policy in the years between WTO accession and the Great Recession is often characterized as targeting the reduction of negative social disruptions stemming from reforms of the late 1990s and WTO-accession-related market openings. However, as we show below, during this period China preferenced foreign investment in sectors deemed important for technology upgrading, even while liberalizing its foreign investment regime to meet explicit WTO mandates. See (Naughton, 2017) for a discussion of the slowdown in reforms following WTO accession.

[5] Enright (2016) provides several descriptive tables detailing the importance and performance of FIEs in China from 1993 to 2013.

dinary amount of data to implement these analytical techniques. To examine the common trends assumption implicit in the method, we examine export entry and volumes both before and after changes in FDI policy. Trends for preferenced industries show no discernible difference from those of industries not so designated. We also consider the possibility of alternative explanations for exporter entry during the period, including the reduction in uncertainty stemming from granting of PNTR to China. While we find that this factor did leada to entry and higer export volumes, its inclusion in our regressions has no impact on the magnitude of the policy effects that we identify. To further assess the robustness of our estimates, we employ detailed China Customs data to estimate the effect of FDI policy changes on both the intensive and extensive of exporting, both for exports in general and to the United States in particular.

The magnitude of the effect of preferential policy on exports appears to be large. Counterfactuals calculated using our reduced form estimates suggest that up to one-quarter of the export surge may be the result of changes in FDI regulation. We also find that the policies do act as techno-industrial policy in that they shift China's export composition toward high-technology industries, raising the high-tech share of exports by about 5 percentage points.

Provide a preview of the paper's structure here.

2 Foreign-Invested Enterprises and Chinese Exports

Significant foreign investment from regions other than Taiwan and Hong Kong began to flow into China by the middle of the 1990s. Attracted by the growing domestic market, many of these investors were quickly disillusioned by rising costs for specialized resources, difficulties with local joint venture partners, and unexpectedly low returns. According to Branstetter and Lardy (2006), even as FDI levels began to fall in the late 1990s, the Chinese government was negotiating terms for WTO accession that dramatically expanded the freedom of foreign firms to operate in China. Among these reforms were reduced regulatory barriers in some sectors and greater freedom to operate as a wholly foreign-owned enterprise (WFOE) rather than as a joint venture (JV) with a Chinese partner. This liberalization, coupled with an expanding domestic economy, led to increased levels of FDI each year from 2000 through 2008 (Enright, 2017, p.37).

As shown in Table 1, foreign invested enterprises are a very important source of Chinese ex-

ports. In 2000, FIEs provided 45.7% of exports to all destinations. Surprisingly given the dynamic nature of China's domestic private sector documented by Brandt et al. (2017), the share of exports originating in a foreign enterprise rose to almost 59% by 2005, before falling back to 48.9% by 2008. These trends indicate what export data explicitly show: exports from FIEs rose faster than exports from domestic firms throughout the period of China's "export surge." The second data column adds another dimension to our understanding of the surge. The share of exports qualifying for special Customs treatment as "processing exports," implying that they are produced with significant shares of imported materials, was 60% in 2000 and fell ever so slightly over the period.

When we consider exports to the United States only, we see that FIEs are an even more likely source of goods. The FIE share of exports to the US was 52.2% in 2000, rising to 67.5% by 2006 before falling back a bit to 58.5% by 2008. Moreover, exports to the US are more likely than not to be produced under a processing Customs regime. In sum, despite almost a decade of growth in domestic manufacturing capabilities, by 2008 China's exports remained heavily dependent on foreign-invested enterprises and global value chains.

3 FDI Policy as Industrial Policy

From its opening to foreign investors, the Chinese government has actively shaped the organizational form and the sectoral composition of direct investment inflows. The first regulations guiding foreign investment were issued in 1995, the *Interim Provisions on Guiding Foreign Investment and the Catalogue for the Guidance of Foreign Investment Industries*. The "Catalogue" was amended many times and it provided broadly defined constraints and opportunities for foreign investors. China's sectoral approach to FDI policy is evident in the nature of the guidance, which targets particular sectors for preference or restriction. Since 2002, the Catalogue has classified investment into particular sectors as encouraged, restricted, and prohibited categories, in accordance with a separate set of regulations adopted in connection with WTO accession (Enright, 2017, p.14). Investment into industries not listed in the Catalogue is permitted, unless prohibited by other regulations. Investors into encourage sectors may enjoy preferential treatment, such as expedited permitting, access to scarce materials or enhanced market access, although the details of specific entry conditions are not publicly known. All forms of ownership are possible in encouraged sectors,

although additional restrictions may apply. Investment into restricted sectors requires case-by-case approval, and then often only in the form of a joint venture with limited foreign control. Prohibited sectors are those in which no foreign investment is allowed.[6]

We use this classification system and changes over time in the Catalogue's guidance to characterize China's sector-based investment policies. Specifically, we draw upon the careful coding by Sheng and Yang (2016) of the Catalogue text into binary codes denoting the policy stance for all 480 four-digit SCIC sectors from 1998 to 2008. The Catalogue was substantially amended in 2002, 2004, and 2007, producing both cross-sectional and time-series variation in the policies we analyze. According to Enright (2016), the 2007 changes are particularly important as they embody a concerted attempt to move China's export profile away from low value-added processing activities and sectors considering resource intensive or highly polluting toward desired high-technology activities.

To illustrate the changing nature of these FDI guidelines, we sort the 29 two-digit SCIC manufacturing sectors into four descriptive groups. The first group, high technology, contains sectors that include industries identified in China's high-technology yearbooks. The second group, fragmented, includes industries in two sectors, electrical machines and transport equipment, both of which have very high levels of production occurring through foreign-invested enterprises.[7] These sectors are deeply embedded into global value chains. The third group, capital intensive, contains industries that have high levels of capital per worker and that are not included elsewhere. Firms in these industries are more likely to be state-owned than those in other groups. The last group, labor intensive, contains industries with low levels of capital per worker.

Figure 1 shows the share of all four-digit industries in each of our four groups that are encouraged (panel a) or restricted (panel b). The graph indicates that the share of encouraged industries is highest in the high-technology group, followed by capital-intensive industries and fragmented industries. All groups experience an increase in the share of industries that are encouraged in 2002, with the largest increase in share encouraged occurring for the capital-intensive group. In 2007, all groups again experience an increase in the share of industries encouraged, with the jump again largest for the capital intensive sector. Despite these changes, high-technology industries are the

[6] This discussion draws from Enright, 2017, pp. 14-16, who provides additional detail.

[7] If we sort these sectors by capital per worker, electrical machines would be placed into the labor-intensive group and transport equipment would be placed into capital-intensive group. Neither is included in the Chinese High-Technology Yearbooks.

most likely to be encouraged, with 60% offering investors preferential treatment. This high share indicates that the Chinese approach to FDI policy, well before the recent 'Made in China 2025' campaign, can be characterized as "techno-industrial policy."

Panel b shows that the share of industries in which investment is restricted has declined for all sectors, although there was little change in policy for labor-intensive sectors until 2007 when almost all restrictions were removed. Particularly noteworthy are the large declines in the restricted share of industries considered high-tech or fragmented in 2002. The policy shift in the fragmented group is pronounced, with 23% of industries restricted prior to 2002 and no industries restricted after 2002.

To further explore the nature of these policy designations, we estimated a linear probability model for both the encouraged and restricted designation. The results of this regression, which pools all sectors observed in the years 1995 through 2007, are shown in Table 2. The coefficient values provide partial correlation coefficients for the selected industry characteristics and the binary policy indicator. As regressors, we include industry characteristics that are mentioned as determinants of Chinese policy in the literature. These characteristics are the industry's capital intensity, measured by its 1998 capital-labor ratio, whether or not the industry appears in the Chinese high-technology yearbooks, the state-ownership share of industrial output, and two measures of pollution intensity (COD intensity, which measures water pollution intensity, and SO2 intensity, which measures a form of air pollution intensity). As can be seen in column (1) and (2), only the high-technology dummy is statistically significant and relatively large, whether or not we control for pollution intensity. This implies that high-tech status is a good predictor of whether or not an industry is encouraged. When we look at the results in columns (3) and (4), we see that only capital intensity is a good predictor of whether or not a sector is restricted and that this correlation is not large.

Given the importance of FIEs to China's export volume and the encouragement given investors in high-technology sectors, we next explore the exporting behavior of foreign and domestic firms in this sector compared to all other sectors. As shown in Figure 2, among domestic firms export values grow steadily in all industries, high-technology and others. However, among foreign-invested firms, exports from the high-technology sector grow faster than those in other sectors, more than quadrupling in value before falling off slightly with the Great Recession.

4 Methodology

4.1 Empirical specifications

To identify the effects of the Chinese FDI policy on the FIE's entry and exports, we exploit the variation in the changes of industry FDI regulation in 1998-2010 using the following generalized differences-in-differences (DD) specification:

$$\ln Y_{jt} = \alpha + \beta_1 Encouraged_{jt} + \beta_2 Restricted_{jt} + \mu_j + \eta_t + \epsilon_{jt}, \tag{1}$$

where Y_{jt} indicates the log of outcomes: ln(number of firms) as firm entry, ln(number of exporters) as exporter entry , and ln(export values) of industry j in year t. $Encouraged_{jt}$ indicates whether the industry j has any encouraged item in the FDI catalogue in year t. $Restricted_{jt}$ indicates whether the industry j has any restricted item in the FDI catalogue in year t. We drop industries that contain activities designated as forbidden items in the catalogue. The left out neutral category includes all the industries that are neither encouraged nor restricted. The parameters of interest are β_1 and β_2. β_1 (β_2) measures the effect of FDI encouragement (restriction) on a series of FIE outcomes.

To aid inference, we include a set of year dummies when estimating (1). The coefficients on these dummies capture temporal changes in FIE activity common to all industries. We also include a set of industry dummies, indicators for the four-digit SCIC sector of the investor. These coefficients capture differences in the attractiveness of sectors for investment. All regressions are two-way clustered at the four-digit SCIC industry and year level to avoid upward bias when estimating standard errors.

4.2 Discussion of identification assumptions

The identification relies on the important assumption that industries with and without policy changes would have similar trends of outcome variables. In this section, we examine the potential threats to the assumption. The primary threat to the "no pre-trend" assumption is policy endogeneity. If the change of FDI policy is driven by unobservable industry characteristics that correlate with outcomes, the estimates will be biased. We examine whether the policy endogeneity leads to

different pre-trends for industries with and without policy change using the following event study framework:

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

The explanatory variables include seven policy-by-year dummies, $Encouraged_{jt}$ and $Restricted_{jt}$, which denote 3 years before the change of the FDI policy to 4 years after. Period 0 denotes the year of policy change. The coefficients of interest, β_{it}, $(i = 1, 2)$, measure how the outcome variables evolve over the seven years' period. In the regression analysis, year before the policy change is left out as the baseline. Since the main policy changes happened around year 2002, we concentrate on the years between 1999 and 2006.

The event study analysis provides an examination of pre-trends in outcome variables. We do not find significant trends in outcomes before the change of FDI policy. The estimates for years after the policy enactment indicate the dynamic effects of FDI policy changes. We graphically show the how the treatment effects evolved over time in Figure 3.

4.3 Policy endogeneity, triple-differences (DDD) method

The DD framework in equation (1) identifies the effect of FDI regulation through industry-by-year changes in FDI policy. A remaining concern, however, is that FDI policy changes are correlated with time-variant, industry-specific unobserved factors. A likely possibility is that exogenous technological change within a global industry makes China a more attractive location for production. If Chinese officials respond to the enhanced investment environment for China by encouraging firm entry, FDI policy is endogenous to firm behavior. Such policy endogeneity would create a correlation between FDI policy and FIE entry These concerns are important and we address them with a triple differencing approach that makes use of the fact that FDI policy affects only foreign firms and not domestic firms. If technological innovation makes China a more attractive location for a particular industry, both foreign and domestic firms should be affected by it. In this case, even though the government encourages foreign firm entry, we should observe entry by both foreign and domestic firms.

These considerations motivate a triple-differences model, using domestic firms as a within-

industry control group, with the following specification:

$$\begin{aligned}\ln Y_{ijt} = \alpha &+ \beta_1 Encouraged_{jt} \times FIE_i + \beta_2 Restricted_{jt} \times FIE_i \\ &+ \gamma_1 Encouraged_{jt} + \gamma_2 Restricted_{jt} + FIE_i \times \mu_j + FIE_i \times \eta_t \\ &+ FIE_i + \mu_j + \eta_t + \epsilon_{jt},\end{aligned} \tag{3}$$

Besides the key interaction term of FDI policy variables and FIE status, we include FIE-by-year dummies, FIE-by-industry dummies, and FIE dummies. The coefficients of interest are β_1 and β_2, which identify the effects of FDI policy as their differential impacts on outcomes of FIEs and Domestics.

To make the most of accessing to the rich transaction-level China Customs Records, we also run similar DDD specifications to examine both intensive and extensive margins for all countries and US only.

We define the intensive margin as the export value of continuous exporters by a particular HS6-level product (00-s) to a particular country (c), where continuous exporters refer to firms conducting exporting throughout the sample period 2000-2008. The extensive margin is defined as the number of exporting firms within a particular HS6-level product to a particular country (c) in year t. Then the differential policy effects on FIE and domestic enterprises can be writte as:

$$\begin{aligned}\ln Y_{icst} = \alpha &+ \beta_1 Encouraged_{st} \times FIE_i + \beta_2 Restricted_{st} \times FIE_i \\ &+ \gamma_1 Encouraged_{st} + \gamma_2 Restricted_{st} \\ &+ FIE_i + \mu_s + \mu_c \times \eta_t + \epsilon_{jt},\end{aligned} \tag{4}$$

where the dependent variable $\ln Y_{icst}$ represents log of intensive (extensive) margin for ownership type i, to country c, for product s, in year t.

5 Data Sources

The study requires detailed information on Chinese industrial firms for an extended period of time. The main source of annual data on manufacturing firms is the annual survey of industrial production (ASIP) for 1998-2010 which includes information for all state-owned industrial firms and non-state

owned firms with sales above 5 million RMB. The dataset is collected through annual surveys by National Bureau of Statistics (NBS) of China and discussed in detail in Brandt et al. (2014). The aggregated value of exports, output, employment, sales, and capital for these firms are nearly equal to the totals reported annually in China's Statistical Yearbook. Compared to the universe of firms observed in the 2004 China Economic Census, our sample of above-scale industrial firms represents the most of industrial production in China. As discussed in Brandt et al. (2017), included firms in the ASIP data account for 91 percent of gross output, 71 percent of employment, 97 percent of exports, and 91 percent of total fixed assets in 2004 census survey year.

The sample represents firms among four-digit Standard Chinese Industry Classification (SCIC) manufacturing industries that are surveyed annually from 1998 to 2010. The SCIC system is comparable to the Standard Industrial Classification (SIC) system used in the U.S. During the sample period, the SCIC codes updated to a new version (GB/T4754-2002). Thus, we converted the old version (GB/T4754-1994) of SCIC codes using Dean et al. (2009)'s concordance table for years before 2002.

We utilized information on firms' registered types (variable dengji zhuce leixing) to identify firms' ownership types.[8] Following Brandt et al. (2017), we also determine firm's ownership type based on the largest ownership share in registered capital. Thus, firms' ownership types can be classified into four categories: state, private, foreign, and Hong Kong, Macao or Taiwan (HKMT). Foreign type includes both wholly-owned-foreign-invested enterprises (WOFEs) and joint ventures with local governments (JVs). For the purpose of this analysis, we then aggregate the firm-level data into industry level to acquire the total number of firms, exporters, and aggregated export values for each ownership type.

To control for the effect of import tariff at SCIC 4-digit level, we use input tariff and output tariff downloaded from the online appendix of Brandt et al. (2017) which is available at https://feb.kuleuven.be/public/N07057/CHINA/appendix/. Input tariffs are aggregated by weighted average of output tariffs using the industry shares from the Chinese 2002 Input-Output table. For CCR regressions at the HS 6-digit level, we obtain Chinese import tariff from World Bank WITS-TRAINS dataset in which the raw data are at HS 6-digit level. We take simple average of

[8]Stipulations on how to distinguish firm ownerships between registered types can be found on the website of China's NBS: http://www.stats.gov.cn/tjsj/tjbz/200610/t20061018_8657.html.

import tariff to avoid potential bias in the industry average because of low trade volumes in heavily protected product lines.

To isolate the effect of Permanent Normal Trade Relationship (PNTR) between China and the US, we include NTR gap calculated by the difference between ad valorem equivalent NTR and non-NTR tariff rates following Pierce and Schott (2016). The data for computing NTR gap from 1989 to 2001 are from Feenstra, Romalis, and Schott (2002). We use the NTR gap for 1999, the year before the passage of PNTR in the US, in our regression analysis. Also, the results are qualitatively robust to using the NTR gaps from any available years. Summary statistics on four-digit SCIC industry-level dependent variables and controls can be found in Table A1.

The FDI policy data used in the paper are from Sheng and Yang (2016). They constructed a unique measure of ownership liberalization using the official government list of industries that were encouraged, restricted, or prohibited for foreign investment. This list, provided in the Catalogue for the Guidance of Foreign Investment Industries (NDRC, various years), was first published in 1995 and was revised subsequently in 1997, 2002, 2004, and 2007. In encouraged industries, foreign investors given more freedom to choose their ownership structures and enjoyed other advantages, such as preferable corporate tax rates, low land costs, and duty-free imported inputs. By contrast, the Chinese government imposed stringent restrictions on ownership structures and high entry costs for foreign investors in restricted or prohibited industries. Summary statistics of policy variables for policy changing years are shown in Table A2.

Export flows by trade type (ordinary or processing trade), by destination country and by ownership category are from China's Custom Office for the period 2000-2008 which record the value and quantity of every transaction that passes through China's customs and are aggregated to the 6-digit Harmonized System (HS) product level. Since HS code versions were updated in 1996 (H1), 2002 (H2) and 2007 (H3) during the sample period, we use concordances obtained from the World Bank's WITS dataset[9] to convert HS codes in each year to H1. we use the HS-SCIC concordance table constructed by the NBS and extended further by Brandt et al. (2017) to obtain export flows by trade type and by destination country at 4-digit SCIC level that we use in industry-level analysis. Since the currency unit in ASIP dataset is thousand RMB, which is different from the unit used in CCR data (US dollar), we convert export values from US dollar to thousand RMB using

[9]See http://wits.worldbank.org/product_concordance.html

official exchange rate (RMB per US$, period average) from World Bank WDI database.

6 FDI Policy and FIE Entry and Export Performance

6.1 Differences-in-differences Analysis

Differences-in-differences (DID) analysis identifies the effect of FDI policy changes from both cross-sectional and time-series variation in policy designations. We expect that preferential policy, captured by the 'encouraged' dummy, reduces the cost of entry for foreign firms and, thus, promotes entry, exporting, and export volumes. We also expect that restrictions on investment, captured by the 'restriction' dummy, will reduce entry of foreign firms and the value of their exports. The details of the policy are important to note, however, as restricted sectors may be open to investment in the form of a joint venture, while wholly owned foreign enterprises are blocked. To capture this possibility, we also divide our sample of foreign firms into joint ventures and wholly owned subsidiaries and analyze these separately.

Table 3 provides our baseline results, using four-digit industry fixed effects and year dummies as controls. Robust standard errors are two-way clustered at the four-digit SCIC industry and year level. We separately analyze samples of foreign-invested enterprises and domestic firms.

The top panel provides results for our analysis of firm entry. As can be seen from the first row of the panel, designating an industry as encouraged raises the number of foreign firms by 0.14 log points, an effect that is statistically significant in the full sample and for both FIE subsamples, JV and WFOE. Reassuringly, the policy has no significant effect on entry of domestic firms. Restrictions on foreign investors reduce their presence in a sector, as shown in the first panel, with an estimated reduction in the number of WFOEs by 0.147 log points. Our results indicate that this designation has no significant effect on the number of JV entrants, consistent with the nature of the policy restriction on ownership and control.

The second panel provides results for DID analysis of the number of firms that export. The estimates imply significant responses by foreign investors to encouraging policies, with the number of FIE exporters rising by an estimated 0.153 log points. We find that the policy raises the number of both JVs and WFOEs who engage in exporting. Again, we find no effect of FDI policy changes on domestic firms. For industries under FDI restrictions, we find that this designation significantly

reduces the presence of WFOE exporters, with an estimated reduction of 0.197 log points in their number. Restrictions have no significant effect on the number of JV exporters or domestic firms, as expected.

The bottom panel examines the response of export values to policy changes. The findings suggest that designating a sector as encouraged raises its exports by an average of 0.357 log points, with a large point estimate for both types of foreign firms but a statistically significant effect only for JVs. This effect is large and we will explore it further in the following sections, where we add additional controls to our analysis. Turning to industries for which foreign investment is restricted, we find that the policy reduces exports from WFOEs, although the point estimate is not significant. However, we find that domestic firms in these industries have higher than expected export values, with a significant point estimate of 0.195 log points.

Other studies suggest that several aspects of trade policy influenced China's export surge. The first of this is the granted of PNTR to China by the United States in 2001. Since this policy change occurred at the same time as a significant revision of Chinese FDI regulations, we need to control for it. We do so by including a separate regressor to capture the response of firms to the end of uncertainty in China's trading status with the US. The "NTR gap" is defined as the difference between the non-NTR rates to which tariffs would have risen if annual renewal had failed and the NTR tariff rates that were locked in by PNTR (Pierce and Schott, 2016). We also include controls for changes in Chinese domestic tariffs, both tariffs on inputs and output tariffs.

For our purposes, the important implication of the results shown in Table 4 is that the addition of this set of controls does not change the conclusions one can draw from Table 3. Designation as an encouraged industry raises the number of FIEs, the number of FIE exporters, and the value of exports originating in foreign-owned firms. The point estimates remain very similar with statistical significance reduced only for the WFOE subsample.

Results for the newly added controls are interesting in their own right. Removal of the uncertainty of annual NTR review is positively associated with the number of FIEs and the number of FIEs that export, with point estimates that are highly significant. We interpret these estimates as confirmation of the mechanisms identified by Pierce and Schott (2014), even though we do not find a significant effect on export values for FIEs overall and a negative effect on exporting by WFOEs. Higher input tariffs are associated with larger numbers of WFOEs and higher WFOE export val-

ues. It is not obvious why WFOEs are differential affected by input tariffs. Perhaps because many WFOEs engage in processing export activity, and thus import inputs duty-free, lower input tariffs after 2002 reduced the advantages they enjoyed over domestic rivals. Lastly, our results suggest that higher output tariffs lead to higher numbers of JV firms and JV exporter, although they reduce export values.

To really push our data, we generalize our approach further by allowing each industry to have its own time trend. Table 5 reports results of the DID analysis, with the inclusion of two-digit industry-specific year trends. Including these controls reduces the size of our estimated effects, but retains the significance of the policy for FIE firm behavior. The estimated impact of encourage status falls from 0.136 log points in Table 4 to 0.998 log points when we allow for industry-specific year trends. The estimated effect on the number of JVs, however, is changed very little as it falls from 0.131 log points to 0.112 log points and remains highly significant. Similarly, we find that our point estimate for the number of FIE exporters is little changed and our estimated effect on export values is higher while remaining statistically significant.

6.2 Triple-differencing analysis

To guard against the possibility that policy changes are correlated with unobservable factors that influence the general level of entry and exporting in an industry, we estimate the impact of FDI policy on foreign firms using domestic firms in the same sector as a control group. These triple-differencing results are shown in Table 6. The entries provide estimated coefficients that measure the impact of FDI policy changes on foreign firms relative to their domestic counterparts. As controls, we include industry and year fixed effects, as well as additional variables that allow ownership specific levels and trends – ownership x industry, ownership x year, and ownership fixed effects. Robust standard errors are two-way clustered at four-digit SCIC and year level.

The triple-differenced results support inferences drawn from the DID analysis. Encouraging FDI policy raises the number of FIEs relative to the number of domestic firms in the same industry by 0.115 log points overall, with significant effects for both the JV and WFOE subsample. Again we find that investment restrictions reduce WFOE entry relative to the number of domestic firms, with designation as a restricted sector associated with a 0.127 log points reduction in wholly owned FIEs. Panel B provides estimates that support the finding that encouraging policy increases the number

of FIE exporters relative to domestic exporters, with the point estimate of 0.18 log points being highly significant. Finally, Panel C provides strong evidence that FDI policy influences export values. Relative to their domestic peers, designation as an encouraged sector raises FIE export values by a very large 0.753 log points, with strong and significant responses found in both the JV and WFOE subsamples. WFOE exports in restricted sectors are much lower than those from domestic firms, with an estimated 0.54 log points reduction in WFOE export values relative to domestic peers. Such large estimated policy impacts raise the question of whether FDI regulation is used to boost Chinese exports in desired sectors, with project approvals favoring those that target foreign markets. We have no direct evidence to support such an interpretation, but these results suggest that further analysis is needed to understand the mechanisms by which FDI policy influences trade flows.

6.3 The margins of exporting

Using detailed China Customs Records, we investigate the effect of FDI policy changes on the margins of exporting, again using a triple-differencing approach. This data source covers the universe of exporters and thus includes many more small and medium firms transactions. We expect that FDI policy, which appears to be focused on entry, would influence the extensive margin of exporting more strongly than the intensive margin of exporting by incumbent firms. To further explore the nature of the response, we also divide exports into processing exports and normal exports, as defined by China Customs. Processing exports are those produced with intermediate inputs imported tariff-free on the condition that they not be sold domestically. We also consider two export samples: exports to all destinations (Table 7) and exports to the United States only (Table 8). These regressions include HS6 product and year fixed effects. Robust standard errors are two-way clustered at the HS6 product and year level.

As seen in Table 7, incumbent FIEs in encouraged industries export significantly more than their domestic peers. Indeed, we estimate that the intensive margin of exporting is 0.40 log points higher for Sino-foreign JVs in encouraged sectors than for their firms in the same industry. Moreover, our estimates suggest that this response is evident mainly in normal exports, which have higher domestic content than processing exports. Policy restrictions significantly deter FIE export volumes for incumbent foreign exporters relative to their domestic peers. This depressing effect on normal

exports appears to be significant for all FIEs and for processing exports from WFOEs only.

Turning to Chinese exports to the United States, presented in Table 8, we find similar patterns in the data. The main contrast with the results estimated for all exports is that the estimated impacts on exports to the US appear to be larger, likely driven by the sectoral composition of the bilateral trade relationship. As an example, designating a sector as encouraged raises the intensive margin of normal exports from JVs to the US by 0.912 log points. Again, the size of these effects suggests that further research on the nature of the incentives facing foreign firms operating in China is needed.

Table 9 presents triple-differenced estimates for the extensive margin of exporting, both to all destinations and to the US only. As expected, we find that designating a sector as encouraged significantly raises the number of HS6-destination pairs to which FIEs export, with the point estimate suggesting an increase of 0.64 log points. The right-hand panel indicates that entry into the US market with new products is particularly strong for FIEs. We find that encourage status for FIEs raises the extensive margin of exporting to the US by 0.13 log points, and that this response occurs in both JVs and WFOEs. Similar to our entry results using the ASIP data, we find that restrictions on FDI entry reduce the extensive margin of exports from WFOEs, while raising them for JVs. These responses are larger for exports to the US than they are for exports to all destinations.

7 Economic Significance

To evaluate the impact of FDI policy changes on China's export surge, we use our reduced form estimates to calculate the implied changes in FIE exports due to policy changes over our sample period. While we note that FDI policy changes may also affect the average flows of investment and, thus, the values of estimated coefficients on year or industry dummies, we believe such general equilibrium effects to be small enough to make our analysis of value. Counterfactual FIE export values are then computed as the FIE export flow that would have occurred in the absence of changes in FDI policy. Therefore, the implied change in FIE export values in year t can be written as:

$$\Delta Export_t = \sum_j X_{jt} \cdot (e^{\beta_1 \cdot \mathbb{1}\{\text{Encouraged}_{jt}\}} - 1)$$

β_1 is the coefficient on the Encouraged dummy in the baseline regression. $\mathbb{1}\{\text{Encouraged}_{jt}\}$ represent whether industry j is encouraged or not in year t. On its counterfactual, X_{jt} equals to the value of FIE exports for industry j in year t. The result of these calculations are shown in Figure 4, which the actual and counterfactual FIE export flows during the sample period. Overall, FDI policy changes explained nearly 27% of the total FIE export surge. We also conduct the same exercise dropping the entire electronics sector (SCIC:39), with the explained share of the total FIE exports induced by policy changes falling to 19% for this reduced set of industries.

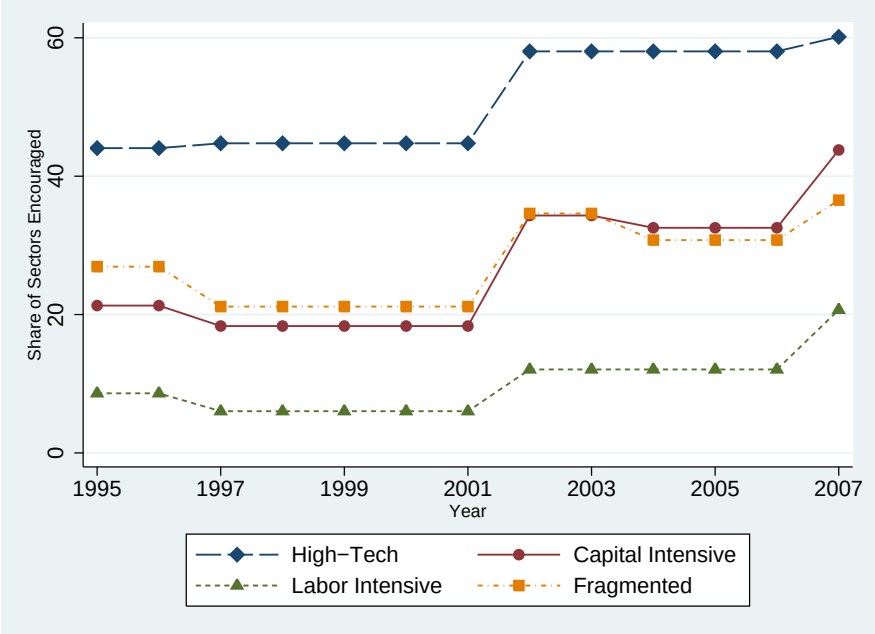
Based on these calculations, we use two pie charts to illustrate how FDI policy changes influenced China's export composition in 2010. Using the industry groupings introduced earlier, Figure 5a shows actual export shares:Labor-intensive, capital-intensive, fragmented, and high-tech each represents 14.5%, 7.6%, 25.2%,and 52.6% of total exports. Whereas Figure 5b represents the no-policy-change counterfactual shares of total exports in the absence of FDI policy changes: Labor-intensive, capital-intensive, fragmented, and high-tech, each represents 17.2%, 8%, 28%, and 46.9% of total counterfactual export values. Comparing shares in two figures, we see that the FDI encouraging policy has the most significant effects on promoting exports in high-tech sector, with share in total exports by 5.7 percentage points.

8 Policy Implications

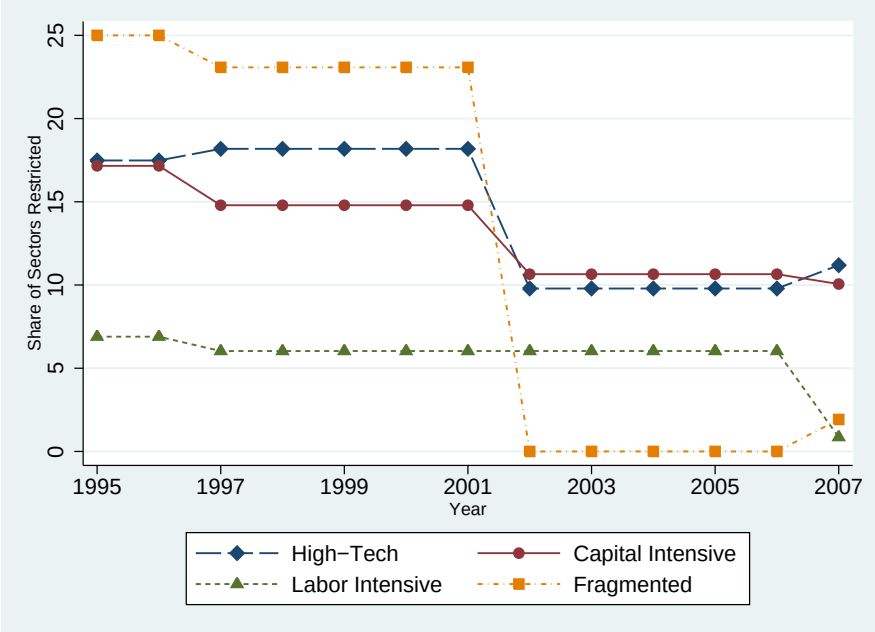
To Be Added

Figure 1: Share of Sectors Designated Encouraged and Restricted, by Group, 1995-2007

(a) Encouraged



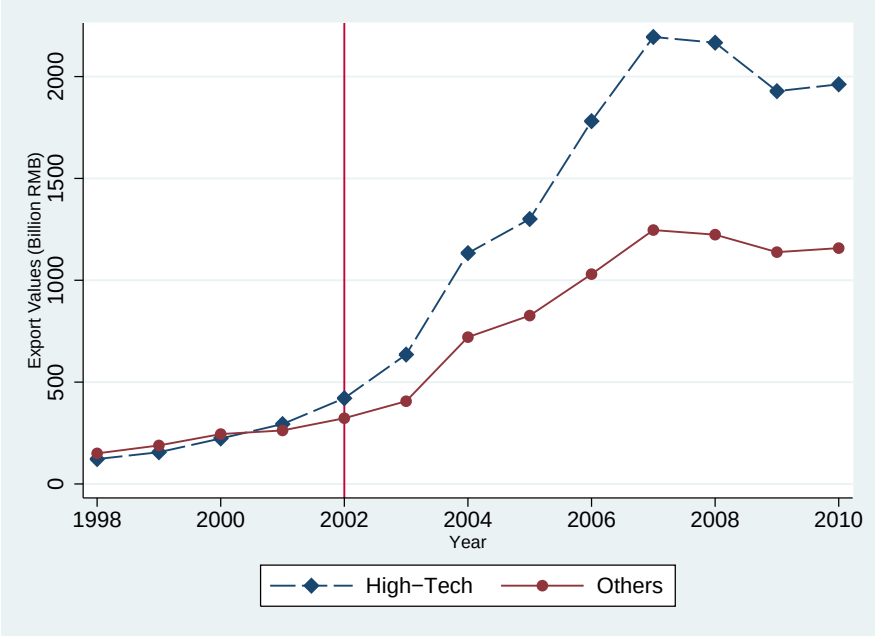
(b) Restricted



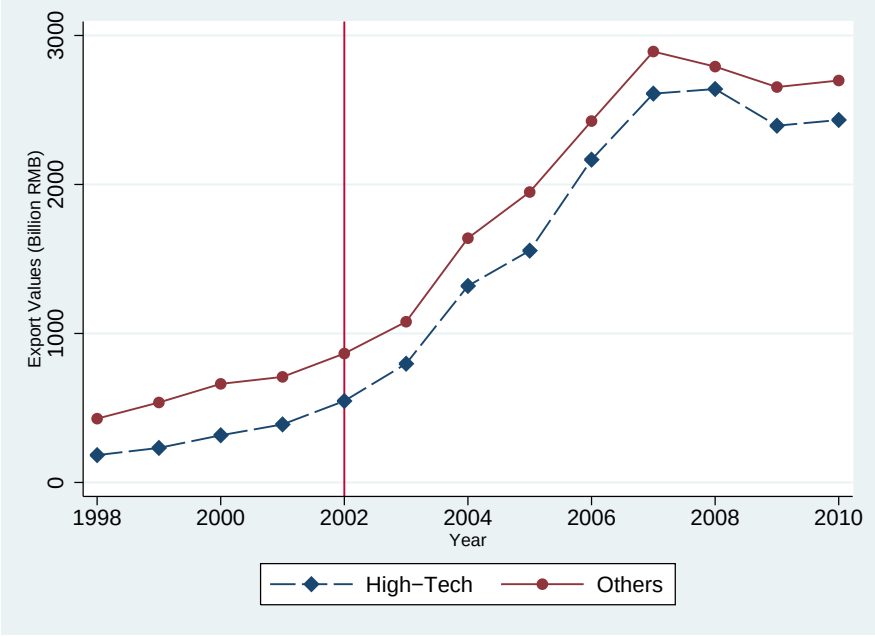
Source: Policy designation at SCIC four-digit taken from Sheng and Yang (2016). Grouping and calculations by authors.

Figure 2: Export Values for Foreign and Domestic Enterprises, High-Tech Sectors and Others, 1998-2010

(a) Foreign Enterprises

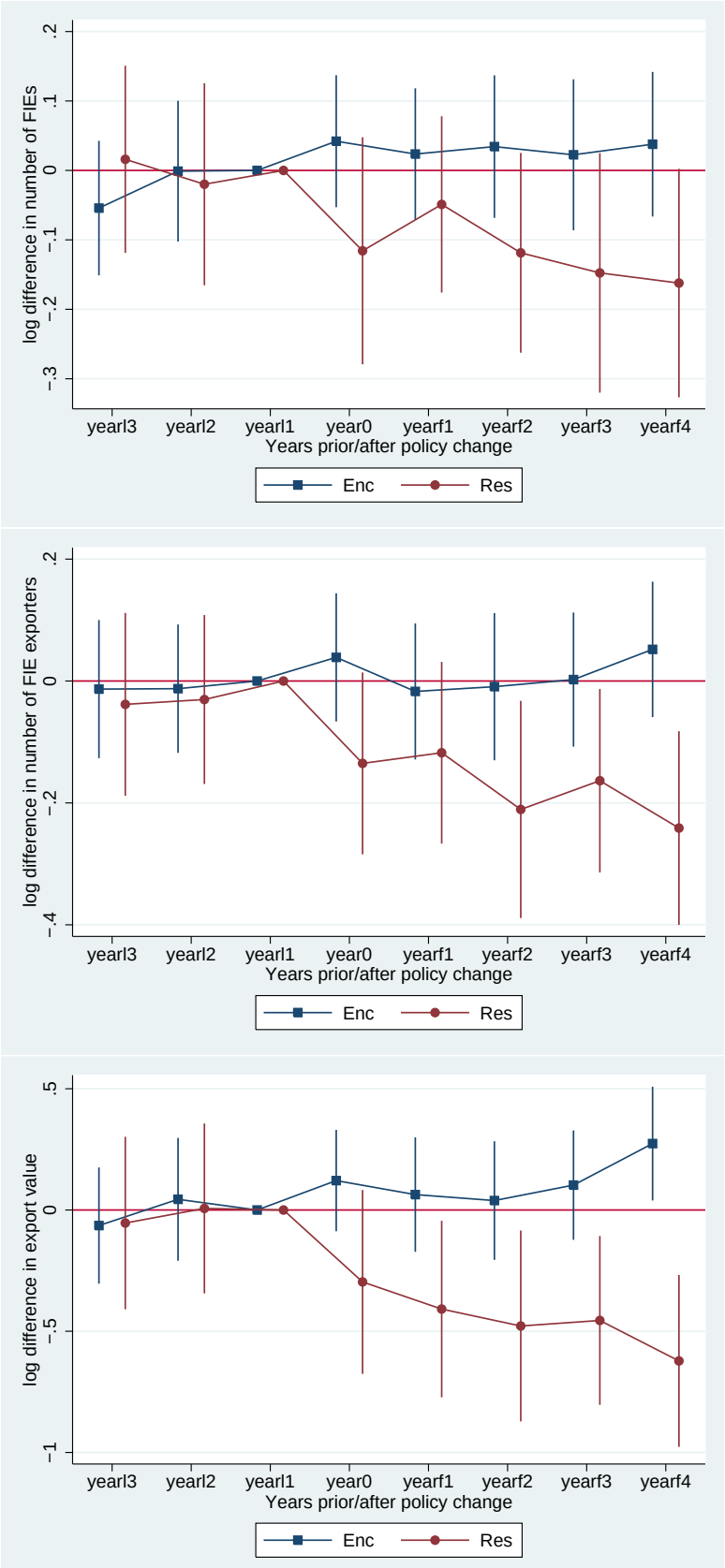


(b) Domestic Enterprises



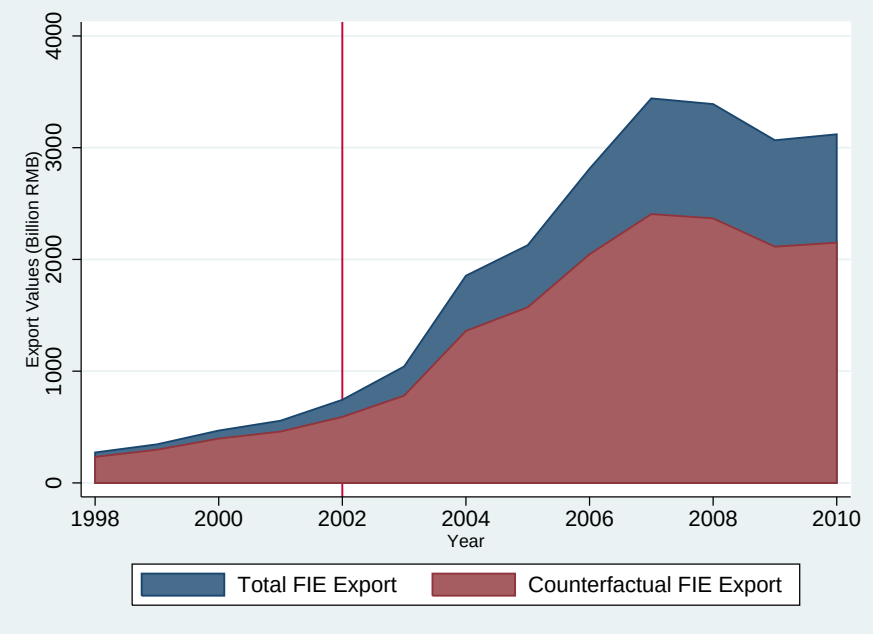
Source: ASIP, with groupings and calculations by authors.

Figure 3: Pre-trends and Post-trends for FDI Policy Changes



Note: These graphs show estimated coefficient values and confidence intervals from estimation of equation (2). See text for details.

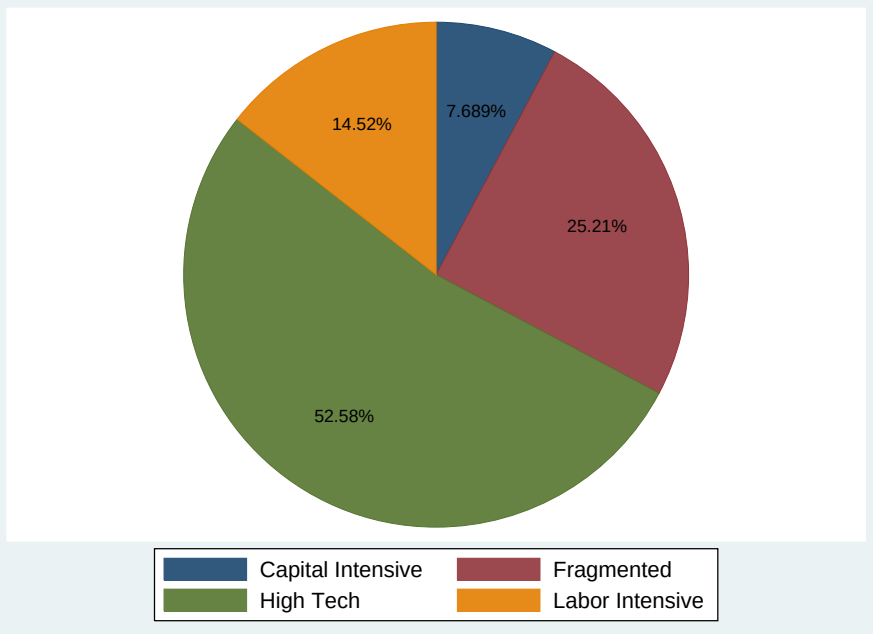
Figure 4: FIE Export Values, Actual v. Counerfactual, 1998-2010



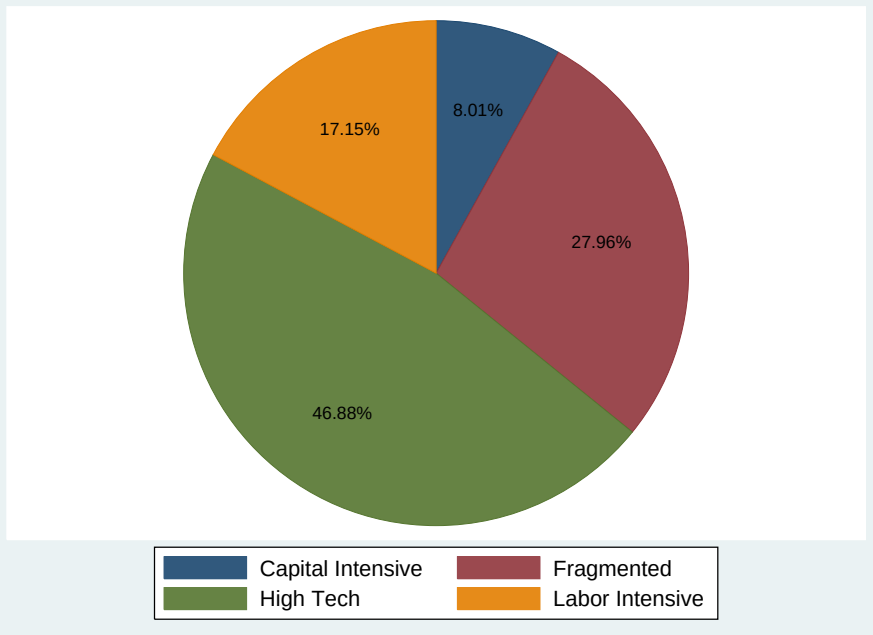
Source: Source of export data is the ASIP.

Figure 5: Share of FIE Export Values by Group, Actual v. Counterfactual, 2010

(a) Actual



(b) Counterfactual



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

Table 1: Export Shares, All Destinations and US Only, 2000-2008

	All Destinations		US Only	
Year	FIE Share	Processing Share	FIE Share	Processing Share
2000	0.457	0.601	0.522	0.707
2001	0.502	0.602	0.542	0.699
2002	0.531	0.598	0.580	0.697
2003	0.559	0.601	0.625	0.702
2004	0.578	0.603	0.660	0.699
2005	0.589	0.598	0.671	0.679
2006	0.587	0.580	0.675	0.661
2007	0.545	0.565	0.648	0.657
2008	0.489	0.544	0.585	0.632

Source: China Customs Records and calculations by authors.

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 3: 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

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

Table 4: Regression DD Estimates of FDI Policy Effects, with Trade Policy 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	0.136**	0.131***	0.095*	0.151**	0.130***	0.095	0.352**	0.371*	0.226
	(0.046)	(0.040)	(0.053)	(0.050)	(0.039)	(0.061)	(0.123)	(0.175)	(0.191)
Restricted	-0.013	0.018	-0.157**	-0.052	0.015	-0.207**	0.168	0.195	-0.475
	(0.044)	(0.041)	(0.067)	(0.049)	(0.046)	(0.079)	(0.161)	(0.187)	(0.347)
NTR Gap×Post	0.782***	0.657***	0.627***	0.887***	0.727***	0.796***	-0.593	0.445	-2.792***
	(0.187)	(0.156)	(0.192)	(0.205)	(0.169)	(0.193)	(0.665)	(0.645)	(0.674)
ln Input Tariff	0.505**	0.295	0.767***	0.447**	0.154	0.891***	0.987	0.263	1.902*
	(0.179)	(0.207)	(0.196)	(0.199)	(0.203)	(0.221)	(0.681)	(0.880)	(0.921)
ln Output Tariff	0.008	0.119***	-0.011	-0.020	0.118**	-0.051	-0.232*	0.135	-0.427**
	(0.034)	(0.033)	(0.046)	(0.040)	(0.049)	(0.048)	(0.124)	(0.269)	(0.194)
Observations	5615	5483	5194	5615	5483	5194	5615	5483	5194

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

Table 5: Regression DD Estimates, with Industry-Specific Year Trends

	(1) FIE	(2) JV	(3) WOFE	(4) Domestic
(*Panel A: Depvar = ln Number of Firms*)				
Encouraged	0.098**	0.112**	0.044	0.013
	(0.037)	(0.038)	(0.038)	(0.041)
Restricted	0.023	0.039	-0.134*	-0.044
	(0.045)	(0.040)	(0.073)	(0.053)
(*Panel B: Depvar = ln Number of Exporters*)				
Encouraged	0.116**	0.107**	0.053	-0.081
	(0.040)	(0.039)	(0.047)	(0.048)
Restricted	-0.005	0.049	-0.180**	0.002
	(0.050)	(0.047)	(0.075)	(0.059)
(*Panel C: Depvar = ln Export Values*)				
Encouraged	0.461**	0.333	0.425**	-0.354***
	(0.154)	(0.187)	(0.175)	(0.104)
Restricted	0.246	0.211	-0.485	0.265**
	(0.157)	(0.212)	(0.301)	(0.095)
Industry Specific Year Trends	Yes	Yes	Yes	Yes
Observations	5615	5483	5194	5425

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

Table 6: 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	0.753***	0.779***	0.658**
	(0.181)	(0.208)	(0.222)
DDD Res	0.126	0.161	-0.540*
	(0.305)	(0.292)	(0.293)
Observations	16892	16760	16471

Note: Table reports results of triple difference-in-differences (DDD) regressions. Dependent variables are log of indicated quantities in four-digit CIC industry j for domestic or non-domestic enterprises in year t. DDD Enc and DDD Res are triple-difference coefficients indicating the differential effects of FDI policy changes on foreign relative to domestic enterprises. All regressions include industry and year fixed effects. Additionally, all regressions include ownership×industry, ownership×year, and ownership fixed effects. Clustered robust standard errors in parentheses. Independent variables representing Chinese FDI policy are dummies indicating whether a certain industry is encouraged, restricted, or not. Source of export data is the ASIP. * $p < .10$, ** $p < .05$, *** $p < .01$

Table 7: Regression DDD Estimates of Policy Effects on Intensive Margin, Total Exports

	Total Export			Processing Export			Normal Export		
	(1) FIE	(2) WOFE	(3) JV	(4) FIE	(5) WOFE	(6) JV	(7) FIE	(8) WOFE	(9) JV
DDD Enc	0.348**	0.067	0.400***	0.130	-0.180	0.451*	0.449***	0.199*	0.457***
	(0.130)	(0.118)	(0.116)	(0.209)	(0.198)	(0.197)	(0.121)	(0.104)	(0.104)
DDD Res	-1.905***	-1.968***	-1.262***	-0.662	-1.767***	0.222	-1.876***	-1.693***	-1.395***
	(0.231)	(0.190)	(0.199)	(0.459)	(0.421)	(0.413)	(0.152)	(0.117)	(0.146)
DDD ln Tariff	0.096	0.146	0.042	-0.033	0.008	-0.123	-0.230	-0.171	-0.175
	(0.133)	(0.114)	(0.129)	(0.205)	(0.196)	(0.198)	(0.155)	(0.112)	(0.139)
ln Tariff	-0.194**	-0.234***	-0.174*	-0.055	-0.081	0.006	-0.062	-0.089	-0.069
	(0.072)	(0.066)	(0.079)	(0.103)	(0.102)	(0.106)	(0.076)	(0.060)	(0.073)
Observations	2912242	2912242	2912242	1134460	1134460	1134460	2651598	2651598	2651598

Note: Table reports results of triple difference-in-differences regressions. Dependent variables are log of indicated quantities in six-digit HS level for domestic or non-domestic enterprises in year t. DDD Enc and DDD Res are triple-difference coefficients indicating the differential effects of FDI policy changes on foreign relative to domestic enterprises. All regressions include product and country-by-year fixed effects. Clustered robust standard errors in parentheses. Independent variables representing Chinese FDI policy are dummies indicating whether a certain industry is encouraged, restricted, or not. Source of export data is China Customs Records. $^{*}\,p < .10$, $^{**}\,p < .05$, $^{***}\,p < .01$

Table 8: Regression DDD Estimates of Policy Effects on Intensive Margin, Exports to US Only

	Total Export			Processing Export			Normal Export		
	(1) FIE	(2) WOFE	(3) JV	(4) FIE	(5) WOFE	(6) JV	(7) FIE	(8) WOFE	(9) JV
DDD Enc	1.207***	0.345	1.085***	1.565***	0.655**	1.724***	1.117***	0.369	0.912***
	(0.190)	(0.232)	(0.207)	(0.330)	(0.270)	(0.302)	(0.213)	(0.228)	(0.222)
DDD Res	-3.323***	-4.081***	-2.358***	-0.977*	-2.449***	0.206	-3.041***	-3.523***	-2.260***
	(0.367)	(0.326)	(0.290)	(0.457)	(0.427)	(0.457)	(0.326)	(0.266)	(0.267)
DDD ln Tariff	0.466**	0.580**	0.524**	-0.296	0.030	-0.191	0.240	0.075	0.433
	(0.191)	(0.192)	(0.214)	(0.218)	(0.235)	(0.233)	(0.245)	(0.203)	(0.242)
ln Tariff	-0.722***	-0.767***	-0.689***	-0.110	-0.292	-0.141	-0.639***	-0.612***	-0.584**
	(0.164)	(0.175)	(0.168)	(0.151)	(0.186)	(0.159)	(0.181)	(0.171)	(0.177)
Observations	56652	56652	56652	35180	35180	35180	54476	54476	54476

Note: Table reports results of triple difference-in-differences regressions. Dependent variables are log of indicated quantities in six-digit HS by country for domestic or non-domestic enterprises in year t. DDD Enc and DDD Res are triple-difference coefficients indicating the differential effects of FDI policy changes on foreign relative to domestic enterprises. All regressions include product and year fixed effects. Clustered robust standard errors in parentheses. Independent variables representing Chinese FDI policy are dummies indicating whether a certain industry is encouraged, restricted, or not. Source of export data is China Customs Records.
$^{*}p < .10$, $^{**}p < .05$, $^{***}p < .01$

Table 9: Regression DDD Estimates of Policy Effects on Extensive Margins, Total Exports and US Only

	To All countries			To the US		
	(1) FIE	(2) WOFE	(3) JV	(4) FIE	(5) WOFE	(6) JV
DDD Enc	0.064***	0.061***	0.071***	0.130***	0.129***	0.164***
	(0.015)	(0.016)	(0.020)	(0.022)	(0.028)	(0.043)
DDD Res	-0.046*	-0.043*	0.081***	-0.175***	-0.156***	0.095**
	(0.024)	(0.022)	(0.024)	(0.031)	(0.033)	(0.029)
DDD ln Tariff	-0.034	-0.054**	-0.033	-0.091***	-0.141***	-0.108**
	(0.019)	(0.021)	(0.026)	(0.018)	(0.023)	(0.033)
ln Tariff	-0.067***	-0.052**	-0.059**	-0.146***	-0.106***	-0.115***
	(0.020)	(0.020)	(0.023)	(0.031)	(0.027)	(0.029)
Observations	4262156	4262156	4262156	64030	64030	64030
FE	HS,C#Y	HS,C#Y	HS,C#Y	HS,Y	HS,Y	HS,Y

Note: Table reports results of triple difference-in-differences regressions. Dependent variables are log of indicated quantities in six-digit HS by country for domestic or non-domestic enterprises in year t. DDD Enc and DDD Res are triple-difference coefficients indicating the differential effects of FDI policy changes on foreign versus domestic enterprises. Clustered robust standard errors in parentheses. Independent variables representing Chinese FDI policy are dummies indicating whether a certain industry is encouraged, restricted, or not. Source of export data is China Customs Records. $^{*}\ p < .10,\ ^{**}\ p < .05,\ ^{***}\ p < .01$

A Appendix

Table A1: Summary Statistics for Dependent Variables

	FIE	JV	WOFE	SOE	POE
ln Export Values	9.36	8.29	8.16	6.01	8.15
	(6.23)	(6.03)	(6.33)	(5.66)	(5.99)
ln Num of Firms	2.38	1.95	1.78	2.13	3.23
	(1.77)	(1.52)	(1.56)	(1.68)	(2.31)
ln Num of Exporters	1.95	1.48	1.49	0.90	1.84
	(1.61)	(1.33)	(1.44)	(1.03)	(1.72)
Observations	7525	7525	7525	7525	7525

Mean coefficients; SD parentheses

Table A2: Summary Statistics for Independent Variables

	All	1998	2002	2007
Encouraged	0.32	0.24	0.36	0.43
	(0.47)	(0.43)	(0.48)	(0.49)
Restricted	0.11	0.15	0.08	0.07
	(0.31)	(0.35)	(0.28)	(0.26)
NTR Gap × Post Dummies	0.19	0.00	0.30	0.30
	(0.19)	(0.00)	(0.15)	(0.16)
ln Input Tariff	2.23	2.47	2.14	1.93
	(0.43)	(0.30)	(0.31)	(0.25)
ln Output Tariff	2.50	2.78	2.42	2.16
	(0.76)	(0.59)	(0.65)	(0.73)
Observations	7525	471	470	470

mean coefficients; sd in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A3: Industry Groupings

CIC	Description	Type	PerWorker Capital in 2010	PerWorker Capital in 1998	Num of Encouraged 4-digit Industries in 2010
13	Agricultural and sideline foods processing	Capital-Intensive	150.013	76.65985	11
14	Food production	Capital-Intensive	146.8188	76.7029	3
15	Beverage production	Capital-Intensive	202.2141	107.4971	4
16	Tobacco products processing	Capital-Intensive	492.8248	250.7272	1
17	Texitile industry	Labor-Intensive	99.5515	48.12793	1
18	Clothes, shoes, and hat manufacture	Labor-Intensive	39.08733	28.56637	1
19	Leather, furs, down, and relatd products	Labor-Intensive	35.56107	31.22734	3
20	Timber processing	Labor-Intensive	96.92658	69.4267	1
21	Furniture manufacturing	Labor-Intensive	69.76802	49.35235	0
22	Papermaking and paper products	Capital-Intensive	242.4071	82.93291	3
23	Printing and record medium reproduction	Capital-Intensive	136.1799	67.95483	0
24	Cultural, eduational, and sports article production	Labor-Intensive	41.56985	26.86092	0
25	Petroleum processing	Capital-Intensive	759.9444	276.2464	1
26	Raw chemical material and chemical products	High-Tech	325.9524	116.0749	23
27	Medical and pharmaceutical products	High-Tech	194.3437	78.49706	5
28	Chemical fiber	Capital-Intensive	335.1028	237.6252	4
29	Rubber products	Capital-Intensive	151.1959	64.65249	5
30	Plastic products	Labor-Intensive	100.6258	77.61932	3
31	Nonmetal mineral products	Capital-Intensive	185.1761	73.47692	18
32	Smelting and pressing of ferrous metals	Capital-Intensive	543.8431	158.7498	0
33	Smelting and pressing of nonferrous metals	Capital-Intensive	395.3686	137.0222	1
34	Metal products	Labor-Intensive	106.8338	55.99288	10
35	Ordinary machinery manufacturing	Capital-Intensive	129.9634	51.40935	23
36	Special equipment manufacturing	High-Tech	129.3776	53.50261	27
37	Transport equipment manufacturing	Fragmented	210.9719	87.04985	12
39	Electric machines and apparatuses manufacturing	Fragmented	111.4917	66.09995	9
40	Communications equipment, computer and other electronic equipment	High-Tech	119.5919	86.72128	18
41	Instruments, meters, cultural and office machinery manufacture	High-Tech	88.84378	50.45344	11
42	Craftwork and other manufactures	Labor-Intensive	58	27.22141	5

Note: High-Tech industries are classified based on the Chinese High-Tech Catalog. They are "Communications equipment, computer and other electronic equipment, special equipment manufacturing, Medical and pharmaceutical products". We include "Electric machines and apparatuses manufacturing, and Transport equipment manufacturing" into fragmented industries because they have high FIE shares 1998. Although some of the industries in the high-tech bin can also be treated as fragmented, we give priority to the Chinese High-Tech Catalog. Then we rank the remaining industries by their capital labor ratio (capital per worker) and classify industries above 50th percentile as capital-intensive industries, and industries falling below the 50th percentile as labor-intensive industries.

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