# Shareholders vs stakeholders: Within-firm reallocation in responses to industry shocks ☆

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# Shareholders vs stakeholders: Within-firm responses to industry shocks

**Abstract**

This paper studies the disparate effects of an economic shock on firms' shareholders and stakeholders. The shock originated from China's Five-Year Plans, which were not preceded by low production/employment, or anticipated by the stock market valuation in the same industries in the U.S., were followed by shrinkage afterwards. Shareholders of well-financed firms with nimble sectorial and territorial layouts came out mostly unscathed due to within-firm adjustments, including moving production to up/down-stream industries that benefit from the boost in the focal industries in China, or offshoring production to the encouraged industries in China. Such adjustments, however, extend limited benefits to the communities.

*Keywords*: Shareholders and stakeholders, within-firm allocation, industry shocks

## 1. Introduction

During the past decade or two there have been ongoing and growing reflection on and critique of shareholder primacy, a theory established in Friedman (1970) stipulating that corporation's primary purpose is to maximize shareholder value. With rising concerns for stakeholders—especially regarding inequality, job displacement, and climate change risks, stakeholder orientation has gained momentum as an alternative governance model, encouraging corporate leaders to serve the interests of stakeholders and not only those of shareholders.[1] The advocacy of "stakeholderism" implicitly assumes that the welfare of shareholders and stakeholders are inevitably, or at least more often than not, in conflict. On the one hand, all constituencies—shareholders and stakeholders alike—are aligned in that they all benefit from the long-term prosperity of a firm; and that they all provide inputs, the commitment and quality of which are essential for the good outcome. On the other hand, at specific decision-making points managers often face trade-offs between shareholders' financial interests and the welfare of other stakeholders. In a stable, long boom, rising tides happily lift all boats; but tension arises the moment firms experience negative shocks. In order to withstand the disruptions, firms must restrategize business scopes and reallocate resources, the process of which potentially generate disparate impact on stakeholders.

There has been a long literature on how firms respond to financial or product market shocks. Constrained by data availability, most of the existent research is conducted at the unit of a firm, documenting firm-level changes such as credit availability, investment, and operating/financial performance. Much less is known as how firms make adjustments

[1] A culminating event of stakeholder advocacy is, perhaps, the Business Roundtable "Statement on the Purpose of a Corporation" in 2019. Signed by 181 CEOs of America's largest corporations, the Statement declared that companies should serve not only their shareholders, but also deliver value to their customers, invest in employees, deal fairly with suppliers and support the communities in which they operate.

within, which cannot be inferred from the metrics aggregated or netted at the firm level. Such adjustments could occur at the intensive margin, i.e., modifying the weights of investment and production among different segments or business establishments; and at the extensive margin, i.e., setting up operations in new sectors or regions, and/or closing down existing ones. A growing number of papers (e.g., Maksimovic and Phillips, 2002; Tate and Yang, 2015; Giroud and Mueller, 2015, 2019) have leveraged census-based data which allow researchers to probe economic activities at the business establishment level. This burgeoning strand of literature has mostly focused on the general efficiency of internal capital and labor markets, and does not highlight how the internal reallocation of resources and productions are motivated by a survival instinct facing a shock, or how the nimbleness with which firms make internal adjustments leads to different outcomes post-shock. The existent research based on the plant-level data also has not focused on how shareholders and stakeholders fare differently post-shock due to firms' responses.

This study integrates the two elements discussed above by exploring how firms make internal production adjustment in response to an external economic shock, and how such adjustments create uneven impact on shareholders and stakeholders. The shock in this study originates from the "Five-Year Plans" of China, the highest level of the central government's industrial policies which prescribe the key sectors the government encourages and supports. The particular Plans we study are the Tenth to the Thirteenth, announced in 2001 to 2016 at five-year intervals. The study builds on business establishment-level data from both the U.S. (U.S. Census LBD data) and China (the China Industrial Enterprises Database). As a first step, we validate the nature of the staggered shocks to U.S. firms by demonstrating that the implementation of a Five-Year Plan was followed by significant production expansion (increase in the number of establishments and level of employment) in the "encouraged" sectors in China. Such expansions crowd out production in the same

sectors in the U.S., leading to significant drops in both employment and investments, and a significant increase in plant closures.

While China's Plans should be motivated by the conditions and prospects of industries in China, Chinese government support bears no empirical relation to the conditions and performance of the same industries in the U.S. In fact, U.S. markets and businesses did not appear to be embracing the imminent shocks in anticipation: The U.S. stock market re-valued firms in industries directly targeted by a Five-Year Plan ("treated firms") only toward the year-end of the publication of the Plan; and the treated firms did not show any slowdown in their job postings up to the year of a Plan. Stock market valuation and desire-to-hire are widely considered to be forward-looking economic indicators that are harbingers of upcoming regime changes. A lack of their pre-response supports the premise that the shocks originated from China were largely exogenous to U.S. firms. A slew of parallel pre-trend tests further supports this hypothesis. Among treated firms and in comparison with control firms, employment and investment (on the intensive margin) started to drop notably one year after the shock, and plant closures (on the extensive margin) followed another year later. Combined evidence validates the Five-Year Plans as industry shocks to the U.S. firms, allowing us to explore responses and consequences, at the plant level, of the treated firms.

Shocks from the Five-Year Plans spill over to related industries, in addition to geographically, motivating firms to make adjustments along these two dimensions. We find that U.S. firms in the upper (or down) stream of the Plan-encouraged industries *and* exporting (or importing) products to (or from) China are indirect beneficiaries of the industrial policy in China.[2] We classify these two groups to be "beneficiary industries." As

[2]In a similar vein, Cai et al. (2019) show that credit provided at favorable terms by the China Development Bank benefit U.S. firms in downstream industries that import cheaper intermediate goods from China.

a result, some treated firms are able to take advantage of the positive spillovers if they are able to leverage pre-existing presence in the beneficiary industries. Indeed, we find that such multi-segment treated firms expand investment and employment into the beneficiary industries, and they experience fewer plant closures. Similarly, firms in "offshorable" industries (following the classification method of Firpo et al. (2011) and David and Dorn (2013)) are able to set up operations in China in the encouraged industries so that they become direct beneficiaries of China's industrial policies.[3]

Interestingly, adjustments discussed above (moving into beneficiary industries along the supply chain and offshoring to China) are both driven by the subsample of firms with low financial constraints, measured as the publicly-traded status, and, within the group of publicly-traded firms, those with low financial-constraint indices (developed in Whited and Wu (2006) and Kaplan and Zingales (1997)). Such a cross-sectional heterogeneity highlights the vital importance of access to financing in order for firms to weather a storm. The fact that the cross-sectional variation holds among U.S. publicly-traded firms (a group which, as a whole, is considered to enjoy the best access to financing on a global scale) is even more telling about the imperative role played by financial markets to help firms adapt to a fast-changing world.

Not surprisingly, firm adjustments are aligned with shareholder interests. Though treated firms (i.e., U.S. firms with Chinese peers supported by the Five-Year Plans) as a whole incur valuation loss (measured by Tobin's $q$ and stock returns), the subset of them that are able to reallocate production, either to upstream/downstream industries that benefit from the boost of production in China in the focal sector, or to the focal sector in China, are able to largely offset the negative valuation impact. In other words, facing an

[3]Foreign-owned firms and joint ventures in China not only enjoy the public goods as a result of government policies promoting the specific industries, but are often eligible for the government preferential policies (e.g., tax rebates, research grants, and talent recruiting) extended to all firms residing in China.

adverse shock of production displacement (due to strengthened competition from China), shareholders of well-financed firms with nimble sectoral and territorial layouts came out unscathed. At the same time, labor in the treated industries and affected regions lose out unambiguously. Other stakeholders, suppliers and customers, experience different outcomes as they could have embraced positive or negative impacts from the original shock rippling through the supply chain.

It is well-documented in the economics, sociology, and medical literature that labor displacement and factory closure lead to personal loss Tate and Yang (2015), community decay (Venkataramani et al., 2020), and widened inequality (Autor et al., 2014). The employment loss due to production shrinkage or even plant closure due to the shock we study in this paper is expected to exert a similar toll on people and communities. When we aggregate our micro-level data to the county level, by defining "treated counties" as those where the treated plants are located, we find that, as expected, treated counties experience employment loss. The less expected and more concerning outcome is, however, that the adjustments firms made for their own survival extend limited benefits to their communities. Even those counties where the "nimble" firms are located (i.e., firms capable of moving to the more profitable nodes of the supply chain and/or offshoring their production) suffer just as much as counties hosting firms that are unable to adjust, presumably because the growing branches of the adjustments often do not feed back to existing employees and current locations. Such findings suggest that capability to cope with shocks is lower for communities than for their business tenants, at least in the short run.

Our study shows, from the micro units, that shareholders are more resilient to shocks than stakeholders due to the nature of firms' adaptive responses. Resource and production reallocation within firms are primarily oriented by the motive to preserve and enhance the value of the firm, which in turn is mostly aligned with shareholders. Though we

analyze one specific, well-defined shock in order to obtain based inferences, the lesson should be generalizable to other major economic shocks. The disparity in outcomes calls for more research and discussions as how our economic system and financial markets could incentivise firms to strategize and operate in ways that balance the interests of shareholders and stakeholders, especially when going through disruption.

The rest of the paper is organized as follows. Section 2 introduces data sources and provides a sample overview. Section 3 establishes the premise that China's Five-Year Plans constitute significantly negative economic shocks to U.S. firms. Section 4 analyzes firms' strategies to reallocate production within firms, and the role played by the financial markets. Section 5 shows the disparate effects of the shocks, and of the adjustments firms made in response, on shareholders and stakeholders (especially the communities). Finally, Section 6 concludes.

## 2. Data and Sample Overview

### *2.1. Data sources*

This study builds on various databases from both the U.S. and China at the establishment level that could be integrated at the industry-year or county-year level. The construction of our main sample requires a merger of U.S. and China nationwide data at the industrial-establishment level, a sample construction tactic that has not been attempted in the literature. We are able to merge the China Industrial Enterprises Database (CIED) with U.S. Census Longitudinal Business Database (LBD) using the International Standard Industrial Classification (ISIC) codes as a bridge for the sample period that runs from 1998 through 2013.

The LBD at the U.S. Census Bureau is a census of businesses in the U.S. that covers 23 million business establishments affiliated with public and private companies in all industries

and all states from 1975–2016. The LBD tracks longitudinal changes in economic activities such as establishment births/deaths, payroll, and employment at the establishment level. It also captures establishment characteristics such as industry classification and location. To trace the production and the investment activities of U.S. business establishments, we merge the Annual Survey of Manufactures (ASM) and the Census of Manufactures (CMF) with the LBD using the establishment-level linking table provided by Census. Key information we use from the ASM and CMF includes capital expenditure, production output, etc.

Similarly, CIED tracks the longitudinal evolution of operating and financial variables for a large sample of business entities affiliated with private and public companies for the period running from 1998 through 2013. The Database builds on annual surveys of firms with revenue above 20 million RMB (before 2009, above 5 million RMB)[4] conducted by the National Bureau of Statistics of China. The key variables from the Database include employment, sales, exports, government subsidies, total assets, and total liabilities, among others. Earlier studies that built on the database include Hsieh and Klenow (2009) and Song et al. (2011).[5] We transform the 6-digit CIC (China Industry Classification) codes in the Database to 4- to 6-digit International Standard Industrial Classification (ISIC) codes based on an industry-matching table compiled by the National Bureau of Statistics of China, and then translate the ISIC codes into 4-digit NAICS industry classification using concordances provided by the U.S. Census Bureau.

It is worth noting that both databases build on mandatory and comprehensive government surveys and both are longitudinal; they cover business entities affiliated with both public and private corporations. The unit of an "establishment" on the U.S. side is slightly more disaggregated than a "firm" on the China side, but the two are close

[4]During our sample period the official exchange rate is about RMB 7.6 per U.S. dollar.

[5]Nie et al. (2012) raised various criticisms regarding the quality of CIED data. Internet Appendix A describes how we mitigate the major issues they raised that are relevant to our study.

in tracking activities at the business-unit level. While an establishment is a production site that is the equivalent of a factory, a "firm" in CIED is equivalent to a branch of a corporation sorted by region or product line. Moreover, "firms" in the China data base include those that are foreign owned or joint ventures. For example, Huawei Technology Co. has 20 firm-level entries in our database, and there are seven recorded "firms" affiliated with P&G Great China.

Critical data input from the CIED regarding government subsidies warrant additional me statements and such information is covered by the database. Subsidy income, provided by either the central or a local government, takes various forms, including tax rebates, financial subsidies, and incentives for new product and technological innovation, including R&D grants.[6] This form of income does not include indirect government support through transaction terms that are more favorable than the market provides, such as low interest loans from state-owned banks or land acquired at below-market prices. Given the difficulty involved in quantifying such indirect support, we acknowledge that recorded subsidies provide an incomplete measure of government support; instead, we assume that subsidies are an informative proxy for the overall support firms receive from the government, especially at the industry level.

In addition to the establishment-level data we use, two additional information sources contribute to our analyses. The first source involves the policy shocks induced by China's Five-Year Plans aimed at promoting industries deemed to be of key importance to the national economy or security. We retrieved data on the Five-Year Plans manually from official documents provided by the State Council of China. The Plans of particular interest to us are the 10th, 11th, 12th, and 13th Five-Year Plans that came into effect in 2001, 2006,

[6]In China, one-quarter of firms' RD expenditures come from government subsidies, according to Fang et al. (2018).

2011, and 2016, respectively. We follow Chen et al. (2017) in defining government-supported industries, which we term "encouraged industries." To further tighten the classification of industries that are treated by government support, we require such industries to be both encouraged in the plan and receiving increased government post-Plan subsidies. More specifically, the treatment requires that the magnitude of subsidy increases over pre-shock benchmark levels during the five years after the shock is above the median across all industries. The control group comprises establishments operating in industries that have not been explicitly encouraged in a given Plan.[7]

We obtain a second set of external data from Burning Glass, which is currently the leading data vendor for job postings in the U.S. The postings are scraped from more than 40,000 digital and non-digital sources, including websites, news-letters, and agency reports, and cover the year 2007, and 2010–2020 (through September 2020). Acemoglu et al. (2020) show that Burning Glass data cover 60%–80% of all U.S. job vacancies. The data report employer names as well as sectors, job titles, skill requirements, and sometimes the offered salary range. The number of all job postings (by unique employers) increases from 13.6 million (26,522) in 2007 to 35.5 million (1.28 million) in 2019.[8] For the manufacturing industries covered by the LBD and the CIED, the numbers range from 372,659 (2,262) in 2007 to 691,888 (1,677) in 2019. The value of job-posting data is that they capture the desire to hire, which isolates labor demand by firms from the outcome of employment that is jointly determined by labor demand and supply. Our analyses based on Burning Glass data will be focused at the industry-month level.

[7]The control group thus includes industries that received high subsidies but are not included in one of the Plans to be conservative because excluding these firms from the control group will only widen the difference between the treated and control firms.

[8]The increase in the number of employers is driven in part by improvements over time in the data collection of data that include employer names.

*2.2. Sample overview and summary statistics*

The merger of LBD and CIED data yields 2,100 observations at the industry-year (4-digit NAICS) level from 1998 through 2013, covering 1,643,000 unique business establishments on the U.S. side and 1,100,000 unique firms on the Chinese side. The merge between LBD and ASM/CMF data yields 1,245,000 unique establishment-year level observations on the U.S. side. To construct variables concerning U.S. firms' and industries' economic activities, we also aggregate the establishment-level data for a give firm-year and industry-year. On the China side, the CIED restricts its coverage to firms reporting at least RMB 20 million (about $2.9 million) in revenue as of 2011,[9] so the industry aggregation is a sum capturing all Chinese firms with revenue above the threshold. Moreover, the filter implicitly requires that each industry-year observation include at least one Chinese firm with revenue over the RMB 20 million threshold, but this requirement is binding in only a handful of industries in the early years of the sample period in China.

Summary statistics are reported in Table 2,[10] following Table 1, in which we define all our variables. On average, each industry represented in our sample includes 586 U.S. establishments (based on the ASM/CMF-LBD merged sample) and 1,208 Chinese firms. The average number of employees is 158.2 (410.7) in the U.S. (China). It is not surprising that Chinese firms are overall more labor-intensive. The summary statistics for U.S. establishments are comparable to those reported in earlier studies (e.g., Giroud and Rauh (2019), Kim and Ouimet (2014)). For instance, the wage per employee in U.S. establishments is around $55,460 in our sample and is between $40,520 and $51,890 for

[9]The calculation builds on the average exchange rate between the U.S. dollar and the Chinese yuan from 1998 through 2013, which is about 7.58 RMB/USD.

[10]In light of clearance requirements of the U.S. Census Bureau, we report pseudo percentiles for each variable (i.e., the 25th, 50th (median), and 75th percentiles) to estimate the corresponding percentiles. For example, the pseudo-25th percentile is defined as the mean value for the subsample between the 24th and 26th percentiles.

Kim and Ouimet (2014).In a given month, an average industry in the U.S. issues 334 job postings.

[Insert Table 1 here.]

[Insert Table 2 here.]

The average leverage, as measured by the fraction of long-term liability in the total assets for Chinese establishments, is 12%, which is slightly lower than the leverage level in Chinese public firms alone (Gul et al., 2010). Regarding export intensity, defined as the proportion of outputs that are export-bound, the average for Chinese industries (17.83%) is higher than the average for the corresponding U.S. industries (10.05%). Given the bilateral trade surplus that favors China, such a gap is not surprising. Finally, the direct help firms receive from the Chinese government is visible: on average, 12.4% of firms operating in Chinese industries receive some type of subsidies, and the average industry-level subsidies in a given year amount to RMB 490 million ($64.6 million) or about 0.26% of the annual sales in a given industry. Government subsidies are not unique to China, as they are common in most major economies.[11] However, subsidies on the U.S. side are not recorded in the Census database and are not a focus of our study.

Building our study based on comprehensive and mandatory national surveys of business establishments in both countries is crucial to overcome the data limitation associated with conventional data sources that cover only publicly traded firms. In 1998 (2015), publicly listed U.S. firms accounted for about 15.6% (11.2%) of the establishments in the U.S. manufacturing sector and 34.3% (28.8%) of employment. On the Chinese side, public firms account for a much smaller share of business activities. According to the CEIC and China's National Bureau of Statistics, employment in all public domestic firms in 2015

[11]See a recent 2021 report (https://www.cfr.org/backgrounder/industrial-policy-making-comeback) by the Council of Foreign Relations.

accounted for 2.4% of total employment in China, while the corresponding shares in earlier years were even more negligible.

## 3. Industry shocks to U.S. firms: China's Five-Year Plans

### *3.1. Five-Year Plans boost production in encouraged industries in China*

Before we examine China's Five-Year Plans (FYPs) on U.S. firms, we first establish the premise the the Plans have the intended impact of boosting production of the encouraged industries in China, which potentially displaces U.S. firms in the same industry. To do that, we estimate the following regression based on a stacked panel data, at the industry ($k$)-year($t$)-Plan($p$) level, that consist of treated and control industries in China over the ten years around each Plan (i.e., five years each before and after a Plan):

$$y_{kt} = \theta \text{ Treated}_{ktp} + \alpha_{kp} + \alpha_{tp} + \varepsilon_{ktp}. \tag{1}$$

In the equation above, $y_{kt}$ is logarithms of the number of firms (employment) in a Chinese industry $k$ in year $t$. The key variable, $\text{Treated}_{ktp}$, is an indicator variable that takes value of one if industry $k$ is included in Five Year Plan $p$ as an encouraged industry and Plan $p$ started in any year during the five-year window $[t-4, t]$. $\alpha_{kp}$ are industry-plan fixed effects, and $\alpha_{tp}$ are year-plan fixed effects. Our empirical strategy is similar to that used by Cengiz et al. (2019) among others. As in Cengiz et al. (2019), we run a stacked regression where each treated unit is compared to not-yet-treated controls, and we also incorporate separate fixed effects for each set of treated units and its control. Results are reported in Panel A of table 3. We find that after the shock, the treated industries in China expanded to a greater extent than non-treated industries, in terms of the number of firms. Specifically, the targeted industries in China experience a surge in the number

of firms (employment) after the release of a Five-Year Plan that is 14.5% (12.5%) greater than corresponding rises in the non-treated industries.

[Insert Table 3 here]

*3.2. Outcomes of U.S. "treated firms" post shock*

Next, we study the effects of China's Five-Year Plans on establishments in the U.S. We estimate the following regression at the establishment ($i$) - year ($t$) - Plan ($p$) level based on a stacked panel data consisting of all relevant establishments in the U.S. over the ten years around each Plan:

$$y_{it} = \theta \text{ Treated}_{i(k)tp} + \alpha_{ip} + \alpha_{tp} + \varepsilon_{itp}. \tag{2}$$

In the equation above, $y_{it}$ is an outcome for establishment $i$ in year $t$, in terms of employment (in logarithm), investment (in logarithm), and plant closure (an indicator variable). The key variable, $\text{Treated}_{i(k)t}$, is an indicator variable that takes value of one if establishment $i$ belongs to an industry $k$ where the same industry in China is included in a Five-Year Plan as an encouraged industry in any year during five-year period $[t-4, t]$. $\alpha_{ip}$ are establishment-plan fixed effects, and $\alpha_{tp}$ are year-plan fixed effects.

The results in Panel B of Table 3 indicate that there are significant negative effects on U.S. establishments after the same industries became covered by the Five-Year Plans in China. The employment and total capital expenditure of an average U.S. establishment in the treated industry decline by about 5.1% and 6.1%. Moreover, we find changes on the extensive margin as well: the likelihood of an establishment closure increases by one percentage point after industry is included in a Five Year Plan (relative to the unconditional closure probability of 8%). Overall, the evidence indicates a significant displacement of

economic activity of U.S. establishments by the boost in production by Chinese firms in the same industry after the industry was targeted by a Five-Year Plan.

It is worth noting that the analyses performed at the business-establishment level as opposed to the firm level using standard databases such as Compustat, which could have led to materially different inferences. In fact, we discover that the number of Compustat firms remains more or less stable post-shock.[12] In other words, our key finding that the China production shocks predict reductions in the number of U.S. factories could not have been revealed using standard firm-level data, as important adjustment occur in the form of within-firm reallocation.

### *3.3. Pre-trends and timing of responses: Affirming the impact of Five-Year Plans*

We wish to reiterate that estimates derived from regression (3) can be interpreted as causal only if the following parallel trends assumption holds: the industries in the treated and control groups would have seen their economic activities evolve similarly in the absence of the Five-Year Plans. While the parallel-trend assumption is inherently nontestable, we shed light on the premise by examining pre-existing trends in greater detail. More specifically, we examine how various outcome variables evolve around the release of the Five-Year Plans for the treated and control groups by estimating the following regression at the establishment (i) -year (t) -plan (p) level:

$$y_{it} = \sum_{\tau=-3}^{4} \theta_{\tau} \text{Treated}_{i(k)tp}^{\tau} + \alpha_{ip} + \alpha_{tp} + \varepsilon_{itp}. \tag{3}$$

We estimate the regression based on the same stacked panel data that we used with equation (2). $\text{Treated}_{i(k)tp}^{\tau}$ is a dummy variable that equals one for an establishment belongs to an industry ($k$) included in a Five-Year Plan ($p$) $\tau^{th}$ ($-\tau^{th}$) year before (after) year $t$, zero

[12] For detailed results, see Internet Appendix Table A2.

otherwise. The definitions of other variables are consistent with those included in equation (2). The coefficient $\theta_\tau$ measures the gap between the treated and control industries in economic activities during the $\tau^{th}$ $(-\tau^{th})$ year after (before) the shocks. The results are reported in Table 4 and plotted in Figure 1.

[Insert Table 4 here]

[Insert Figure 1 here]

The outcome variables associated with columns (1) and (2) are the logarithms of employment and investment for establishments. In column (3) we report the dynamics of the number of establishments in U.S. industries. In column (4), the outcome variable is the indicator of establishment closure. Insignificant coefficients on Treated$^\tau$ for the pre-shock periods suggest that, before the Plans, the establishments in the treated and control groups shared a similar trend in economic activities, satisfying a parallel pre-trend. In contrast, coefficients on Treated$^\tau$ for post-shock periods are all significant no later than $\tau = 2$, indicating that such a policy shock casts a negative shadow on establishments in the U.S. in terms of employment, investment, and the number of active and surviving establishments. The evidence that employment and investment shrink (in year $t+1$) before the closing down of establishments (in year $t+2$) is also a plausible sequence of changes on the intensive margin precede those on the extensive margin.

It could still be argued that the absence of preexisting trends is not sufficient for a full parallel trend conclusion: Chinese government could have chosen to implement supportive policies in industries that were on the verge of an inflection point such that China would have overtaken the U.S. in those industries at the same time but in the absence of the Plans. In other words, we still need to affirm that the Chinese government does not formulate its industrial policies in the Five-Year Plans in anticipation of the decline of

the same industries in the U.S.[13] For this reason, we highlight two economic measures that are "leading indicators" or forward-looking, that is, measures such that their current levels already incorporate economic agents' anticipation of future prospects. Two common measures we consider are stock-market valuation and firms' desire to hire.

The results, reported in columns (5) and (6) of Table 4, show that stock returns and Tobin's $Q$ values are comparable between treated and control firms prior to the Plans. Because of the required information from the stock market, the analysis is conducted at the firm-year-plan level based on a stacked panel of publicly traded firms in a structure similar to that in equation (3). Tobin's $Q$ is the ratio of the sum of the market value of equity and the book value of debt over the book values of equity and debt. To the extent that stock markets are reasonably efficient, information about the future of the U.S. economy (that is available to the Chinese government) should also have been priced. In other words, if certain industries in the U.S. were expected to be outcompeted by their peers in China even in the absence of the Plans, the stock-market valuation should have already reflected that negative prospect. The fact that both forward-looking measures (recorded at year-ends) take a significant dip in the year of an announcement and the following year suggests that the stock market was processing new information, and in a quite timely way, gleaned from policy announcements.

For column (7) of Table 4 we conduct an analogous analysis with $Job\ Postings_{US}$, defined as the total number of job postings for all firms in an industry in a given month, as the outcome variable. The results indicate that job postings for treated and control groups do not diverge before the shock, suggesting that U.S. firms were not anticipating the relative weakening of the industries that were about to be targeted by China's Five-

[13] If the Chinese government actually targets industries in which the U.S. enjoys a *growing* advantage based on their "natural growth cycles" then it could help strengthen our results because it would be more difficult to obtain our current results.

Year Plans. Job postings by treated firms drop significantly relative to control firms, but only after a Plan is implemented.

We note that it is generally considered implausible by the vast economics literature to assume that a government can process information that can used to predict and anticipate the evolution of economic activities in a way that outperforms the aggregate wisdom of the securities market and firms. In fact, the ability to aggregate information to guide resource allocation is considered the fundamental strength of markets over any government alternatives. Thus, the most likely explanation for the findings reported in Table 3 could be attributed to a real impact of China's government policies on the China-U.S. race to lead in the targeted industries.

## 4. Upstream and downstream: Industry effect and within-firm reallocation

### *4.1. Upstream and downstream industries*

In the previous section, we illustrate an aggregate negative impact of China's industrial policies on U.S. firms whose same-industry peers in China are expanding. Like most shocks, however, the Plans could still create winners among some U.S. firms, for which two industries emerge as front candidates. Table 3 Panel A shows that booms follow Plans in industries that are encouraged by the Plans in China. Based on the input-output relations, we expect industries that are upstream and downstream to the focal industries are expected to benefit as either their outputs are in higher demand or their inputs become more abundant. For these industries in the U.S. to benefit, we further need to require that the upstream (downstream) industries in the U.S. are exporting (importing) significant volumes to China.

We thus evaluate the following regression based on a industry-year-plan level stacked panel data that only include nontreated industries:

$$
\begin{aligned}
y_{kt} &= \theta_1 \; UpstreamToTreated_{ktp} * ExportToChina_{-1,kp} \\
&+ \theta_2 \; DownstreamToTreated_{ktp} * ImportFromChina_{-1,kp} + \alpha_{kp} + \alpha_{tp} + \varepsilon_{ktp}.
\end{aligned} \tag{4}
$$

$UpstreamToTreated_{ktp}$ ($DownstreamToTreated_{ktp}$) is a dummy variable that takes a value of one for the five years after the release of a Five Year Plan if industry $k$ is nontreated and its maximum percentage of output supplied to (input sourced from) a treated industry in year -1 falls in the top tercile among all nontreated industries. $ExportToChina_{-1,kp}$ is a dummy variable equal to one if industry $k$ mainly supplies to a treated industry of which upstream industries have an above-median average export intensity to China (the percentage of output exported to China) in the year before the release of plan $p$. $ImportFromChina_{-1,kp}$ is a dummy variable equal to one if industry $k$ mainly sources from a treated industry of which the downstream industries have an above-median average import intensity from China (the percentage of input sourced from China) in year -1. We include the industry-plan fixed effects to control for invariant heterogeneity across industries and include the year-plan fixed effects to control for the macroeconomic trend. The results are reported in Table 5.

[Insert Table 5 here]

As expected, Table 5 shows that U.S. upstream exporting industries experience a 1.5% growth in the number of establishments and a 2.0% growth (both are significant at the 5% level) in employment post Five-Year Plans, relative to industries unrelated to the Plans. For the U.S. downstream importing industries, the effects are similar at 1.9% and 1.5% (both are significant at the 10% level). We are thus able to term these two industries $Beneficiary$ industries for the analyses in the next section.

The fact that the same shock could have created winners and losers corroborates findings from recent studies along different dimensions. For example, Bena and Simintzi (2019) show that the 1999 U.S.-china bilateral agreement toward freer trade led to labor outsourcing across borders which in turn discouraged innovative processes aiming at reducing production cost. Cai et al. (2019) find that government-subsidized credit in China at the top of supply chains leads to lower prices and higher exports for firms in downstream industries, which crowds out U.S. firms in the same industry but crowds in downstream firms regarding business performance and employment.

### *4.2. Within-firm reallocation of production to beneficiary industries*

The impact on individual establishments is likely to be more nuanced than that on the industry level as the shocks could have created winners and losers. This section is thus devoted to sorting out heterogeneity across firms in their adaptivity to the policies originating from China. The analyses is done at the establishment level because our goal is to study within firm reallocation of resources. We consider four groups of establishments. The first group, $Treated$, includes establishments of U.S. firms whose same-industry peers in China are supported by the Five-Year Plans. The results in the previous section show that these establishments experience significant reductions in employment and investment. Establishments that are not in the $Treated$ group but belong to firms that have at least one establishment in the treated group are called *SameFirmAsTreated*.

We then further partition *SameFirmAsTreated* group into three more refined groups based on the expected exposure to China's industrial policies. $SameFirmAsTreated * BeneficiaryUpstr_{-1}$ is a group of establishments that belong to *SameFirmAsTreated*, are in an industry that is upstream to a treated industry, and have a relatively high export intensity to China. Establishments in these group are expected to benefit from China's industrial policies because they are suppliers to firms in industries that are encouraged by

the China's industrial policies. Similarly, $SameFirmAsTreated * BeneficiaryDownstr_{-1}$ is a group of establishments that that belong to *SameFirmAsTreated*, are in an industry that is downstream to a treated industry, and have a relatively high import intensity from China. Establishments in these group are expected to benefit from China's industrial policies because they are customers of firms in industries that are booming in China. Finally, $SameFirmAsTreated * NonBeneficiary_{-1}$ contains all other establishments that belong to $SameFirmAsTreated$ group. Establishments in these group are not expected to benefit from China's industrial policies. All the beneficiary status variable carries the time subscript $-1$ to denote that such status is ex ante, record during the year prior to the beginning of a Five-Year Plan.

We estimate the following regression on a stacked panel at the establishment ($i$)-year ($t$)-Plan ($p$) level:

$$\begin{aligned} y_{it} &= \theta \text{ Treated}_{itp} + \delta_1 SameFirmAsTreated_{itp} * BeneficiaryUpstr_{-1,ip} \\ &+ \delta_2 SameFirmAsTreated_{itp} * BeneficiaryDownstr_{-1,ip} \\ &+ \delta_2 SameFirmAsTreated_{itp} * NonBeneficiary_{-1,ip} + \alpha_{ip} + \alpha_{tp} + \varepsilon_{itp}. \end{aligned} \tag{5}$$

The results are reported in Table 6. The coefficients of $Treated$ in columns (1) through (3) are consistent with evidence reported in the previous section: U.S. establishments whose same-industry peers in China are supported by the Five-Year Plans experience significant reductions in employment and investment (both in intensive and extensive margins).

[Insert Table 6 here]

We now turn our attention to a subset of multi-segment firms with at least one "treated" plant (i.e., an establishment in the industry displaced by expanded production in China) and at least one plant in a "beneficiary" industry. These firms face disruption

and at the same time also hold branches in winning industries, which allow them to pivot toward bright spots more quickly or at lower cost compared to their disrupted peers without such toeholds. If such firms do leverage their toeholds by moving resources and production from the distressed sectors to the bright spots, we should observe plants in beneficiary industries with "sister plants" (affiliated with the same firm) in the disrupted industries to expand significantly, relative to plants without association with the treatment. Such a relation is confirmed by columns (1) through (3) of Table 6. Establishments that were expected to benefit from China's industrial policies indeed experience significant increases in employment (3.2%)and investment (5.2%). Moreover, the likelihood of an establishment closure is 1.3% lower relative to establishments that belong to firms with no Treated establishment.

Because regression 5 includes establishment-plan FE, the variables are already demeaned from the average levels of the same establishment over a ten-year period. They have also incorporated year-Plan fixed effects, taking out the unconditional effects on all establishments from the cycles of the Five-Year Plans. In the end, the coefficients on the four variables in the first three columns of the table indicate that, firms with disrupted establishments as well as establishments in beneficiary industries witness decrease (increase) of production in the former (latter). Their other establishments maintain the neutral level of changes relative to the reference categories of establishments without association with the shock.

In a full-sample regression, the reference category in first three columns of Table 6 is plants that are themselves not in the treated industry and that are without "sister plants" in the treated industries. We would like to further affirm that there is within-firm move to the beneficiary industries conditional on non-treated establishments. That is, we would like to abstract from the direct shock effect on the treated establishment and focus on within-

firm production reallocation among all establishments in non-treated industries. Columns (4) through (6) of Table 6 estimate regression (5) for the sub-sample of establishments that excludes establishments in the treated industries:

$$\begin{aligned} y_{it} &= \delta_1 SameFirmAsTreated_{itp} * BeneficiaryUpstr_{-1,ip} \\ &+ \delta_2 SameFirmAsTreated_{itp} * BeneficiaryDownstr_{-1,ip} + \alpha_{ip} + \alpha_{jtp} + \varepsilon_{itp}. \end{aligned} \tag{6}$$

In this specification, we also replace year-plan fixed effects $\alpha_{tp}$ with firm-year-plan fixed effects $\alpha_{jtp}$, for the purpose of extracting within firm variation in outcome variables. In the full sample analysis presented columns (1)–(3), not including the firm-year-plan fixed effects allows us to show how each group of establishments in the "treated" firms are affected and ensure that the "reallocation" indeed reflects a growth in the beneficiary sectors rather than being driven by the decline of other groups. In the latter analysis, incorporating the firm-year-plan fixed effect helps control all potentially confounders at the firm-year level and therefore rule out the possibility that the effect could be explained by potential concurrent patterns that the treated firms with operation in beneficiary industries experienced overall growth in non-treated industries and firms without such a business operation experienced overall shrinkage around the shock. The results columns (4) through (6) show that firms indeed reallocate resources to establishments that were expected to benefit from China's industrial policies. These establishments experience significant increases in employment and investment and have a significantly lower likelihood of an establishment closure.

The comparison between the first and last three columns of Table 5 also indicate that the inclusion of treated establishments in the sample does not drive the magnitude or the significance of the results. Overall, these findings indicate a large degree of heterogeneity in the effects of the China's industrial policies on U.S. firms, depending on the pre-exiting

sectoral distribution of their business establishments.

### *4.3. Role of financial constraints*

Within firm reallocation of resources can be a costly procedure. For instance, shifting production capacities across establishments is likely to require non-trivial capital expenditures. We therefore conjecture that binding financial constraints can limit resource reallocation within firms. To test this hypothesis, we estimate the following regression specification in the sub-sample of firms with high and low financial constraints:

$$y_{it} = \delta SameFirmAsTreated_{itp} * BeneficiaryUpDown_{-1,ip} + \alpha_{ip} + \alpha_{jtp} + \varepsilon_{itp}. \quad (7)$$

$SameFirmAsTreated * BeneficiaryUpDown$ equals one if either $SameFirmAsTreated * BeneficiaryUpstr$ or $SameFirmAsTreated * BeneficiaryDownstr$ equals one. All other variables are as in equation (6). We present four sets of results based on four financial constraint measures: WW (Whited and Wu, 2006) index, KZ (Kaplan and Zingales, 1997) index, leverage, and being a private firm (as opposed to a public firm).[14] A firm-year is considered financially constrained if it falls into the top quartile of the financial constraint indices.

The results are reported in table 7. Across all four measures of financial constraints we find that firms with non binding financial constraints more aggressively reallocate resources to establishments that are likely to benefits from the China's industrial policies. In fact, changes in employment and investment for financially constrained firms are insignificant

[14]Based on Whited and Wu (2006), WW index is defined as a linear combination of cash flow to total assets ratio, dividend dummy, long-term debt to total assets ratio, logarithm of total assets, three-digit SIC industry sales growth, and firm sales growth. Following Kaplan and Zingales (1997), KZ index is defined as a linear combination of cash flow capital ratio, Q value, debt to total capital ratio, dividend to capital ratio, and cash to capital ratio. Following Giroud and Mueller (2019), we define leverage as a ratio of the sum of debt in current liabilities and long-term debt to total assets.

when we use WW index, KZ index, and leverage. In contrast, changes in employment and investment for financially unconstrained firms are significant across all measures of financial constraints. Overall, the evidence indicates that access to capital is a critical determinant of firms' responses to changes in investment opportunities and to counter disruptions. Such a relation is likely to be generalizable beyond the setting of shocks from China's industrial policies.

[Insert Table 7 here]

## 5. The disparate effects on shareholders and stakeholders

### *5.1. Valuation of firms adapting to the shock*

The previous section, especially Table 6, documents how firms reallocate resources and production within the enterprise in order to weather an economic storm or benefit from new investment opportunities. A natural question that follows is to what extent the ability to make such adjustments by some firms, facilitated by their pre-existing advantageous positions, could neutralize the unconditional negative effects on firms and their shareholders in the industries targeted by the Five-Year Plans. To address this question, we conduct the following regression at the firm ($j$)-year ($t$) -plan (p) level for the sub-sample of U.S. publicly listed firms based on the same stacked panel data we used for columns (5) and (6) in Table 4:

$$y_{jtp} = \theta_1 \text{Treated}_{jtp} + \theta_1 \text{Treated}_{jtp} \cdot \text{Adjustable}_{jp,-1} + \alpha_{jp} + \alpha_{tp} + \varepsilon_{jtp}. \tag{8}$$

In Equation (8), the dependent variables ($y_{jtp}$) are shareholder return (cumulative stock returns over the time period starting from five years before the release of a Five-Year Plan to the end of a given year) and firm valuation (Tobin's $Q$, or a firm's market-to-book

value ratio). Both are direct metrics for investors/shareholder welfare. The coefficient associate with the independent variable $Treated_{jtp}$ captures the unconditional impact of the shock from China's Five-Year Plans on treated firms. The variable of key interest is, however, the interaction term $Treated_{jt} \cdot Adjustable_{j,-1}$, where the interactive variable $Adjustable_{j,-1}$ is a dummy variable equal to one if firm $j$ is pre-positioned to respond to shocks based on its condition in year $-1$, or one year before the announcement of a Five-Year Plan. The regression incorporates firm-plan fixed effects as well as year-plan fixed effects. Because the regression sample is a stacked panel, the specification ensures that each calendar years has its plan-specific fixed effects. Results are reported in Table 8. The first row merely echos Table 4 that the Five-Year Plans exert an unconditional negative impact on the treat firms in terms of valuation and shareholder return.

[Insert Table 8 here]

The coding of the variable $Adjustable_{jp,-1}$ is based on the analyses in the previous sections. We consider three conditions (measured in the year prior to a Plan) that make firms *a priori* adaptive. The first variable, $ChinaPresence_{-1}$, is an indicator variable for whether a firm has production or operating presence in China, based on textual information in firm 10-K filings. We set $ChinaPresence_{-1}$ to be one if the firm's 10-K filing in year $-1$ mentions a manufacturing site or an operations facility in China and to equal zero if such a discussion or mention is absent.[15] The procedure identifies 15.6% of U.S. public firms as having a significant production/operation presence in China in 1998, with the percentage rising to 51.3% by the end of 2013. Columns (3) and (4) of Table Table 8 show that firms

[15]Merely sales and distribution centers do not count. More specifically, we extract all sentences in a 10-K that include "China" and at least one of the keywords that indicate production activities. The list of keywords is as follows: facility, facilities, manufacture, manufacturing, manufactured, manufactures, operation, operations, operate, operating, factory, factories, production, producing, produce, produces, produced, plant, plants, site, sites, subsidiary, subsidiaries, establishment, establishments. We then manually process the information to code the variable at the firm-year level.

with pre-existing China presence are able to offset between two-thirds and four-fifth of the negative impact suffered by treated firms without China presence. Presumably because existing establishments in China allow firms to offshore promptly post shock.

The second variable capturing a firm's ex ante ability to adjust is its pre-existing exposure to the "beneficiary industries" (defined in Section 4.2). The indicator variable $BeneficiaryIndExposre_{-1}$ is coded as one if the firm owns at least one plant, during the year prior to a Plan announcement, in an industry that is upstream (or downstream) to the treated industries and exports to (or import from) China at a high level. Columns (5) and (6) of Table 8 show that firms in such a favorable position at the time of the shock are able to close down around two-thirds of the negative impact on treated firms without such exposure. Finally, $LowConstraint_{-1}$ is an indicator variable for a firm to be in the bottom four quintiles by financial constraint using the Whited-Wu index (Whited and Wu, 2006). The last two columns of Table 8 again show these firms recover over 80% of the negative valuation effect incurred by the more constrained treated firms. The incremental effects associated with all three proxies for adaptability are statistically significant.

Table 8 shows that firm adjustments are aligned with shareholder interests. Though treated firms (i.e., U.S. firms whose same-industry peers in China are supported by the Five-Year Plans) as a whole incur valuation discount and shareholder return loss, the subset of them that are able to reallocate production, either to upstream/downstream industries that benefit from the boost of production in China in the focal sector, or to the focal sector in China, are able to largely offset the negative valuation impact. In other words, facing a adverse shock of production displacement (by the strengthening competitors from China), shareholders of well-financed firms with nimble sectoral and territorial layouts came out nearly unscathed.

*5.2. Effects on community*

We have just shown that when firms are well-positioned to make adjustments, a negative economic shock does not take its toll on shareholders. The same inference cannot not be extended to stakeholders. Section 4 already shows that some of the upstream and downstream firms along the supply chain may benefit from a boost in the focal industry in China, already suggesting a heterogeneous impact on stakeholders. This section we further examine the impact on another important stakeholder, the communities that host the directly-affected plants.

To start with, we define each county's "treatment intensity" as the percentage of establishments in the county whose same-industry peers in China are supported by a given Five-Year Plan during the five years preceding a given year, and as zero otherwise. Conditional on a county being "treated" (i.e., a county that hosts at least one treated plant), we further define the reallocation intensity for each treated firm in the county as the increase in the share of establishments in the beneficiary upstream/downstream industries as a percentage of the total number of establishments in non-treated industries around the release of a Five-Year Plan. In other words, we construct a ratio of the number of establishments in beneficiary industries to the number of establishments in all non-treated industries for a treated firm. For each firm, we calculate the changes in the ratio before versus after a plan's release and refer to such change as the "reallocation intensity" of a firm. Then we take an average of the firm-level reallocation intensity over all treated firms that operate in the county at the time of a Plan's release and sort all treated counties based on the reallocation intensity. We define HighAdjustment as a dummy variable equal to one if a county falls in the top quintile and zero otherwise. We are interested in knowing not only whether treated counties suffer with the plants they host, but, more importantly, whether the nimble responses some firms make (which benefit shareholders) could also save

their community from the harm. The regression follows the following specification at the county-year-plan $(c, t, p)$ level:

$$y_{ct} = \theta_1 \text{TreatIntensity}_{ctp} + \theta_2 \text{TreatIntensity}_{ctp} \cdot \text{HighAdjustment}_{cp} + \alpha_{cp} + \alpha_{tp} + \varepsilon_{ctp}. \quad (9)$$

In Equation (9), the dependent variables include the logarithm of employment and the percentage of plants that experience a closure, both at the county-year level. Moreover, we include a third variable which is opioid prescription per 100 residents at the county-year level as a proxy for the well-being of a community. The information is retrieved from the CDC website covering the time period of 2006 to 2020 (containing the 11th to the 13th Five-Year Plans). Such a test is based on the hypothesis that fading economic opportunities due to production displacement by external economic shocks may have contributed to the US opioid overdose crisis. All regressions include county-plan and year-plan fixed effects. Results are reported in Table 9.

[Insert Table 9 here]

The coefficients on $TreatIntensity_{ctp}$, shown in the odd columns of Table 9, are negative and significant as expected. If firms are impaired by the negative shocks, their community likely suffer as well due to declined employment opportunities or even factory closures. Moreover, opioid usage increases significantly after the local business establishments are disrupted by the external economic shock. While such a relation has been narrated in media and books, the existent literature (notably Currie, Jin and Schnell (2019)) has yielded ambivalent inferences on the causal relationship between general economic conditions and the abuse of opioids. Our study thus offers novel evidence on the causal relation from a large economic shock.

What is potentially surprising are the coefficients associated with the interaction term

$TreatIntensity_{ctp} \cdot HighAdjustment_{cp}$, which are all insignificantly different from zero. In other words, the adjustments firms made for their own survival extend limited benefits to their communities. Counties where the "nimble" treated firms are located (i.e., firms that move to more profitable nodes of the supply chain and/or offshore their production post shock) suffer just as much as counties hosting firms unable to adjust. The absence of a difference suggests that the growth parts of the adjustments often do not feed back to existing employees (due to skill mis-match) or to current locations (because, for example, the production and employment could have been off-shored or relocated to other parts of the country). Contrasting this outcome with that enjoyed by shareholders suggests that capability to cope with shocks is lower for communities than their business tenants, at least in the short run.

## 6. Conclusion

Connecting establishment-level data from the U.S. and China, we trace out the consequences of China's Five-Year Plans on U.S. firms via production displacement. We find that U.S. firms whose same-industry peers in China are supported by the Plans lose production and employment, but a subset of firms do not experience valuation discount or lower shareholder returns because they are able to make adaptive adjustment, including moving productions to up/down stream industries that could benefit from the booming focal industries in China, or offshoring to China. Their adjustment is facilitated by the financial markets. Though shareholders of such nimble firms do not take a toll from the negative shock, their stakeholders suffer just as much as those hosting un-adjusting firms. The different fate of shareholders and stakeholders going through an economic shock calls for discussions of how our economic system and financial markets could encourage firms, investors, and stakeholders to operate in ways that balance the interests.

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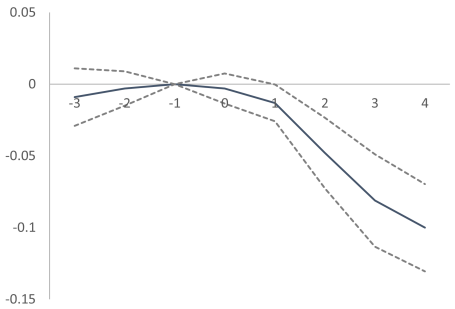
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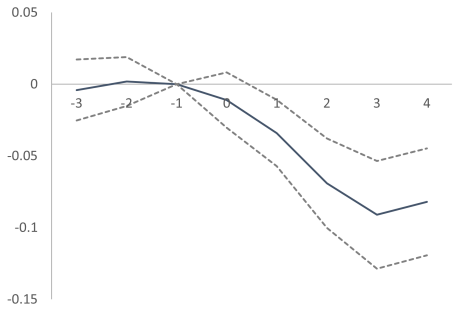
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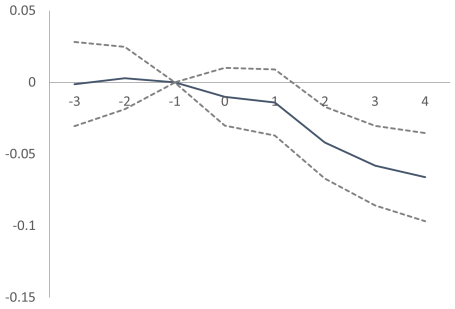
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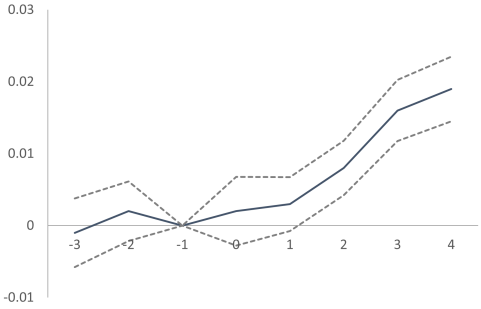

(a) The employment of U.S. establishments around a Five-Year Plan.



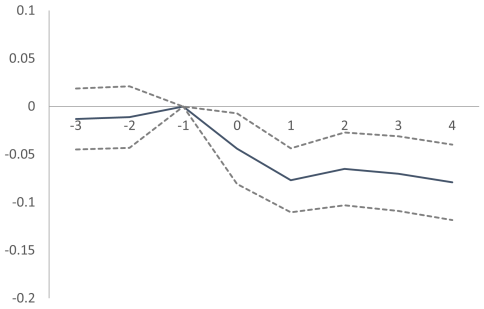

(b) The investment of U.S. establishments around a Five-Year Plan.



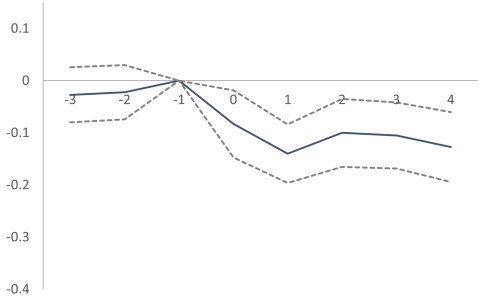

(c) U.S. establishments operating in an industry around a Five-Year Plan.



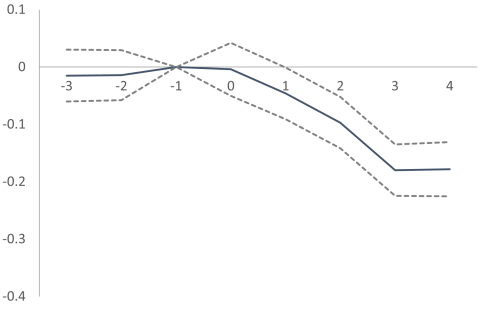

(d) The likelihood of closure of U.S. establishments around a Five-Year Plan.




(e) The accumulated stock returns of U.S. firms around a Five-Year Plan.




(f) The Tobin's Q of U.S. firms around the release of a Five-Year Plan.




(g) Job postings in a U.S. industry around a Five-Year Plan.

Figure 1: **Outcome dynamics around releases of Chinese Five-Year Plans.** In this figure we present in graphic form the outcome dynamics around releases of a Five-Year Plans based on estimates reported in Table 4. The horizontal axis represents the year relative to the release of a Five-Year Plan. The solid line represents the difference between the treated and control groups with respect to the corresponding outcome variable. The dotted lines represent 95% confidence intervals for the estimates.

Table 1: **Variable Definitions.**

| Variable | Definition |
|---|---|
| $Firms_{CN}$ | Number of firms in an NAICS-4 digit industry in China in a given year. |
| $Establishments_{US}$ | Number of establishments in an NAICS-4 digit industry in the U.S. in a given year. |
| $Employment_{US}$ | Total employment of an establishment in the U.S. in a given year. |
| $Investment_{US}$ | Total capital expenditure of an establishment in the U.S. in a given year. |
| $Closure_{US}$ | A dummy variable equal to one if a US establishment experiences closure during a given year, and zero otherwise. |
| $AccumReturn_{US}$ | The accumulated stock returns of a US establishment starting five years before the enactment of a Five-year Plan until the end of a given year. |
| $Q_{US}$ | The Tobin's Q of an establishment at the end of a year in a U.S. Tobin's Q is measured by $(AT + (CSHO * PRCC_F) - CEQ)/AT$ using variables from Compustat. |
| $Job\ Postings_{US}$ | The number of job postings for all firms in an NAICS-4 digit industry in the U.S. in a given month. |
| *Treated* | A dummy variable that equals one for the five years following the release of a Five-Year Plan for U.S. establishments in an industry encouraged in the Plan and experiencing above-median subsidy growth in the post-shock period from the level in the pre-shock period, and zero for the previous five years and for those establishments in an industry not encouraged in the Plan. In Table 7, $Treated$ is defined at the firm level, which is a dummy variable equal to one for the five years after the release of a Plan if a U.S. public firm has an establishment operating in a treated industry in the Plan, and zero otherwise. |
| $Treated^{\tau}$ | A dummy variable that equals one for the $\tau^{th}$ $(-\tau^{th})$ year after (before) the announcement of a Five-Year Plan if an establishment is in an industry encouraged in the Plan and experiencing above-median subsidy growth in the post-shock period from the level in the pre-shock period, and zero otherwise. |
| *SameFirmAsTreated* | A dummy variable that equals one for the five years following the release of a Five-Year Plan if an establishment is in an non-treated industry but belongs to the same firm as an establishment in an industry encouraged in the Plan and experiencing above-median subsidy growth in the post-shock period from the level in the pre-shock period, and zero otherwise. |
| $BeneficiaryUpstr_{-1}$ | A dummy variable that indicates whether an establishment is in an industry that is upstream to a treated industry and has a relatively high export intensity to China. More specifically, it equals one if an establishment belongs to an industry that supplies to a "treated" industry of which upstream industries have a weighted average export intensity to China above the median. To define an upstream industry to a treated industry, we use $Upstream_To_Treated$, a dummy variable equal to one if an industry is a major industry that supplies inputs to a treated industry. For each non-treated industry j, we define the input intensity to treated industries as the largest percentage of the inputs a treated industry sourced from industry j. Then we sort the input intensity to treated industries across non-treated industries and define those non-treated industries that fall in the top tercile as the major upstream industry of a treated industry. |

| | |
|---|---|
| $BeneficiaryDownstr_{-1}$ | A dummy variable that indicates whether an establishment is in an industry that is downstream to a treated industry and has a relatively high import intensity from China. More specifically, it equals one if an establishment belongs to an industry that sources from a "treated" industry of which downstream industries have a weighted average import intensity from China above the median. To define an downstream industry to a treated industry, we use $Downstream_To_Treated$, a dummy variable equal to one if an industry is a major industry that sources inputs from a treated industry. For each non-treated industry j, we define the input intensity from treated industries as the largest percentage of the inputs industry j sourced from a treated industry. Then we sort the input intensity from treated industries across non-treated industries and define those non-treated industries that fall in the top tercile as the major downstream industry of a treated industry. |
| $NonBeneficiary_{-1}$ | A dummy variable that equals one if an establishment does not belong to a treated industry or a beneficiary upstream or downstream industry of a treated industry. The variable equals zero otherwise. |
| $BeneficiaryUpDown_{-1}$ | A dummy variable indicating whether an establishment belongs to a beneficiary upstream or downstream industry of a treated industry. In other words, the variable equals to one if $BeneficiaryDownstr_{-1}$ or $BeneficiaryDownstr_{-1}$ equals one, and zero otherwise. |
| $ChinaPresence_{-1}$ | A dummy variable indicating whether a U.S. public firm has a business presence in China the year before the release of a Five-Year plan. We set China presence dummy to one if the 10-K of a firm-year includes a discussion about a manufacturing facility in China or mentions an operation site/facility in China, and to zero if such a discussion or mentioning is absent. |
| $BeneficiaryIndExposure_{-1}$ | A dummy variable that equals one if a firm operates in beneficiary upstream/downstream industries the year before a Plan's release, and zero otherwise. |
| $LowConstraint_{-1}$ | A dummy variable that equals one if a firm's WW index falls in the bottom four quintiles the year before the release of a Five-Year plan, and zero otherwise. |
| $TreatIntensity$ | For the five year after the enaction of a Five-Year Plan, the variable equals the percentage of establishments in a county whose same-industry peers in China are supported by a Five-Year Plan, where the percentage is calculated based on the pool of establishments in a county one year before the shock. The variable takes a value of zero otherwise. |
| $HighAdjustment$ | A dummy variable equal to one if an average treated firm's intensity of reallocation to upstream and downstream beneficiary industries in a county falls in the top quintile across all counties. To define the intensity of reallocation, for each treated firm that operates in a county at the time of a Plan's release, we first calculate the share of establishments in the beneficiary industries as a percentage of the total number of establishments in the non-treated industries (including beneficiary industries and other non-treated industries), for the five years before and after the release of a Five-Year Plan respectively. A treated firm's intensity of reallocation is defined as the firm's increase in such a percentage before versus after a Five-Year Plan. |
| *Subsidy (nominal)* | The sum of the subsidies an industry received in a given year (in millions of RMB). |
| *Subsidy (# of firms)* | The total number of subsidized firms in an industry in a given year. |

Table 2: **Summary statistics.** In this table we report summary statistics at the industry and firm/establishment levels for the main sample. All variables are defined in Table 1. All potentially unbounded variables are pre-winsorized at the 0.5% and 99.5% extremes. In column (1) and (2) we report the mean and standard deviation of each variable. In columns (3)–(5) we report their values at the 25th, 50th, and 75th percentiles.

| | Mean (1) | Std Dev (2) | 25% (3) | Median (50%) (4) | 75% (5) |
|---|---|---|---|---|---|
| **A. Statistics at the industry level** | | | | | |
| $Establishments_{US}$ | 585.5 | 614.8 | 195.9 | 395.6 | 739.9 |
| $Output_{US}$ | 29.9 | 54.4 | 5.5 | 14.6 | 35.0 |
| $Job\ Postings_{US}$ | 333.7 | 699.2 | 21.0 | 87.0 | 270.0 |
| $Export_{US}$ | 10.05% | 8.46% | 4.05% | 8.57% | 13.73% |
| $Firms_{CN}$ | 1,208 | 1,704 | 233 | 577 | 1,444 |
| $Employment_{CN}$ | 496,100 | 764,100 | 114,500 | 251,000 | 536,400 |
| $Export_{CN}$ | 17.83% | 17.20% | 4.78% | 11.30% | 26.89% |
| *Revenue (CN)* | 220,713 | 1,749,833 | 32,754 | 58,575 | 130,093 |
| *Subsidy (nominal)* | 490.0 | 1,191 | 37.2 | 130.6 | 435.5 |
| *Subsidy (# of firms)* | 150.1 | 205.0 | 31.0 | 76.9 | 186.1 |
| **B. Statistics at the firm/establishment level** | | | | | |
| $Employment_{US}$ | 158.2 | 389.7 | 23.5 | 66.5 | 164.3 |
| $Investment_{US}$ | 2,030 | 19,740 | 29.4 | 213.7 | 936.8 |
| $Closure_{US}$ | 0.08 | 0.27 | 0.00 | 0.00 | 0.00 |
| $AccumReturn_{US}$ | 0.59 | 1.62 | 0.02 | 0.18 | 0.85 |
| $Q_{US}$ | 1.66 | 0.93 | 1.10 | 1.40 | 1.89 |
| *Revenue (CN)* | 220,713 | 1,749,833 | 32,754 | 58,575 | 130,093 |
| *Wage Expense (CN)* | 10,918 | 96,860 | 1,450 | 3,118 | 7,106 |
| *Book Leverage (CN)* | 12.13% | 25.96% | 0.00% | 0.00% | 4.01% |

| | |
|---|---|
| $Output_{US}$ | The total output of all firms for an NAICS-4-digit industry in the U.S. in a given year (in billions of USD), which is derived from the variables in CMF (ASM) using the following formula: tvs (total value of shipment)+ fie (inventories - finished goods at the end of a given year)- fib (inventories - finished goods at the beginning of a given year) + wie (inventories - work in process at the end of a given year) - wib (inventories - work in process at the beginning of a given year). |

Table 3: **The impact of industrial policies in Chinese Five-year Plans.** The table reports the impact of industrial policies in Chinese Five-year Plans on China's targeted industries and U.S. establishments in the same industries. We incorporate industry-plan fixed effects and year-plan fixed effects in Panel A, and establishment-plan fixed effects and year-plan fixed effects in Panel B. All variables are defined in Table 1. The $t$-statistics are based on standard errors clustered at the industry level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: The production of China's treated industries post-shock

| Dependent variable: | $\log(\text{Firms}_{CN})$ (1) | $\log(\text{Employment}_{CN})$ (2) |
|---|---|---|
| Treated | 0.145*** | 0.125*** |
| | (2.83) | (3.02) |
| Observations | 1,900 | 1,900 |
| Industry-Plan FE | Yes | Yes |
| Year-Plan FE | Yes | Yes |
| Observation level | Industry | Industry |

Panel B: Outcomes of U.S. treated establishments post-shock

| Dependent variable: | $\log(\text{Employment}_{US})$ (1) | $\log(\text{Investment}_{US})$ (2) | $\text{Closure}_{US}$ (3) |
|---|---|---|---|
| Treated | -0.051*** | -0.061*** | 0.010*** |
| | (-6.17) | (-5.67) | (7.14) |
| Observations | 1,245,000 | 1,245,000 | 1,245,000 |
| Establishment-Plan FE | Yes | Yes | Yes |
| Year-Plan FE | Yes | Yes | Yes |
| Observation level | Establishment | Establishment | Establishment |

Table 4: **Outcome dynamics: Encouraged versus non-encouraged industries.** The results reported in this table indicate how economic activity in U.S. establishments/firms evolves around the release of Chinese Five-Year Plans for the treated and control groups, corresponding to equation (3). We incorporate year-plan fixed effects for all columns. We also incorporate establishment fixed effects for columns (1)–(3), firm fixed effects for columns (4) and (5), and industry fixed effects for columns (6) and (7). All variables are defined in Table 1. The t-statistics are based on standard errors clustered at the industry level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

| | $\log(\text{Employment}_{US})$ (1) | $\log(\text{Investment}_{US})$ (2) | $\log(\text{Establishments}_{US})$ (3) | $\text{Closure}_{US}$ (4) | $\text{AccumReturn}_{US}$ (5) | $\text{Q}_{US}$ (6) | $\log(\text{Job Postings}_{US})$ (7) |
|---|---|---|---|---|---|---|---|
| $\text{Treated}^{-3}$ | -0.009 | -0.004 | -0.001 | -0.001 | -0.027 | -0.013 | -0.015 |
| | (-0.88) | (-0.37) | (-0.08) | (-0.41) | (-1.00) | (-0.80) | (-0.65) |
| $\text{Treated}^{-2}$ | -0.003 | 0.002 | 0.003 | 0.002 | -0.022 | -0.011 | -0.014 |
| | (-0.49) | (0.23) | (0.27) | (0.95) | (-0.83) | (-0.67) | (-0.63) |
| $\text{Treated}^{0}$ | -0.003 | -0.011 | -0.010 | 0.002 | -0.083** | -0.044** | -0.004 |
| | (-0.56) | (-1.12) | (-0.97) | (0.82) | (-2.53) | (-2.34) | (-0.17) |
| $\text{Treated}^{1}$ | -0.013** | -0.034*** | -0.014 | 0.003 | -0.140*** | -0.077*** | -0.046** |
| | (-1.99) | (-2.88) | (-1.19) | (1.57) | (-4.90) | (-4.52) | (-2.01) |
| $\text{Treated}^{2}$ | -0.048*** | -0.069*** | -0.042*** | 0.008*** | -0.100*** | -0.065*** | -0.097*** |
| | (-3.83) | (-4.34) | (-3.29) | (4.14) | (-3.01) | (-3.35) | (-4.24) |
| $\text{Treated}^{3}$ | -0.081*** | -0.091*** | -0.058*** | 0.016*** | -0.105*** | -0.070*** | -0.180*** |
| | (-4.93) | (-4.75) | (-4.10) | (7.35) | (-3.26) | (-3.53) | (-7.87) |
| $\text{Treated}^{4}$ | -0.100*** | -0.082*** | -0.066*** | 0.019*** | -0.127*** | -0.079*** | -0.178*** |
| | (-6.45) | (-4.32) | (-4.21) | (8.29) | (-3.72) | (-3.94) | (-7.38) |
| Observations | 1,058,000 | 1,058,000 | 49,000 | 1,058,000 | 49,000 | 1,900 | 16,357 |
| Establishment-Plan FE | Yes | Yes | | Yes | | | |
| Firm-Plan FE | | | | | Yes | Yes | |
| Industry-Plan FE | | | Yes | | | | Yes |
| Year-Plan FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observation level | Establishment | Establishment | Industry | Establishment | Firm | Firm | Industry |

Table 5: **U.S. upstream and downstream industries.** In this table we report results pertaining to the impact of industrial policies in Chinese Five-year Plans on economic activities of the U.S. industries from the upstream or downstream perspective. Columns (1) and (2) present results pertaining to the effects on the logarithm of establishments and employment in the industries that supply products to a focal U.S. industry (the upstream perspective), and in columns (3) and (4) we report the impact on the logarithm of establishments and employment in the industries that source inputs from a focal U.S. industry (the downstream perspective). All variables are defined in Table 1. The *t*-statistics are based on standard errors clustered at the industry level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

| Dependent Variable: | $log(Establishments_{US})$ | $log(Employment_{US})$ | $log(Establishments_{US})$ | $log(Employment_{US})$ |
|---|---|---|---|---|
| Industry Type: | Upstream | Upstream | Downstream | Downstream |
| | (1) | (2) | (3) | (4) |
| UpstreamToTreated*ExportToChina$_{-1}$ | 0.015** | 0.020** | | |
| | (2.02) | (2.15) | | |
| DownstreamToTreated*ImportFromChina$_{-1}$ | | | 0.019* | 0.015* |
| | | | (1.73) | (1.75) |
| N | 1,900 | 1,900 | 1,900 | 1,900 |
| Year FE | Yes | Yes | Yes | Yes |
| Industry-Plan FE | Yes | Yes | Yes | Yes |

Table 6: **Within-firm reallocation in response to Five-year Plans: Upstream/downstream industries.** In this table we report results pertaining to the impact of industrial policies in Chinese Five-year Plans on economic activities of the U.S. industries from the upstream or downstream perspective. Columns (1)–(3) present how affected firms adjust their economic activities in the targeted industries by a plan, the targeted industries' upstream and downstream sectors which presumably benefits from the shock, and other industries. We incorporate establishment-plan fixed effects and year-plan fixed effects in columns (1)–(3). Columns (4)–(6) report the within-firm reallocation among different types of industries, where we incorporate establishment-plan fixed effects and firm-year-plan fixed effects. All variables are defined in Table 1. The *t*-statistics are based on standard errors clustered at the industry level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

| Dependent variable: | $\log(\text{Employment}_{US})$ (1) | $\log(\text{Investment}_{US})$ (2) | $\text{Closure}_{US}$ (3) | $\log(\text{Employment}_{US})$ (4) | $\log(\text{Investment}_{US})$ (5) | $\text{Closure}_{US}$ (6) |
|---|---|---|---|---|---|---|
| Treated | -0.047*** | -0.058*** | 0.009*** | | | |
| | (-5.97) | (5.41) | (6.93) | | | |
| SameFirmAsTreated*BeneficiaryUpstr$_{-1}$ | 0.032** | 0.052*** | -0.013*** | 0.044** | 0.053** | -0.016** |
| | (2.24) | (3.06) | (-5.87) | (2.15) | (2.03) | (-2.32) |
| SameFirmAsTreated*BeneficiaryDownstr$_{-1}$ | 0.051*** | 0.068*** | -0.015*** | 0.063*** | 0.069*** | -0.018*** |
| | (3.12) | (4.34) | (-7.06) | (2.86) | (3.11) | (-2.89) |
| SameFirmAsTreated*NonBeneficiary$_{-1}$ | -0.013 | -0.006 | 0.003 | | | |
| | (-0.80) | (-0.35) | (0.24) | | | |
| Sample | | All industries | | | Non-treated industries | |
| Observations | 1,245,000 | 1,245,000 | 1,245,000 | 1,051,000 | 1,051,000 | 1,051,000 |
| Establishment-Plan FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Year-Plan FE | Yes | Yes | Yes | | | |
| Firm-Year-Plan FE | | | | Yes | Yes | Yes |
| Observation level | Establishment | Establishment | Establishment | Establishment | Establishment | Establishment |

Table 7: **Within-firm reallocation in response to Five-year Plans: High versus low financial constraints.** In this table, we report within-firm reallocation among different types of industries in response to Five-year Plans, for the affected firms with high and low financial constraint separately. Columns (1) and (3) focus on firms with high financial constraint, whereas columns (2) and (4) focus on firms with low financial constraint. We present four sets of results based on four financial constraint measures: WW index, KZ index, leverage, and being a private firm (as apposed to a public firm.) We incorporate establishment-plan fixed effects and firm-year-plan fixed effects in all analyses. All variables are defined in Table 1. The $t$-statistics are based on standard errors clustered at the industry level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

| Dependent variable: | log(Employment$_{US}$) | | log(Investment$_{US}$) | |
|---|---|---|---|---|
| | High Constraint | Low Constraint | High Constraint | Low Constraint |
| | (1) | (2) | (3) | (4) |
| *WW index:* | | | | |
| SameFirmAsTreated*BeneficiaryUpDown$_{-1}$ | 0.017 | 0.139*** | 0.015 | 0.140*** |
| | (0.39) | (2.75) | (0.35) | (2.77) |
| *KZ index:* | | | | |
| SameFirmAsTreated*BeneficiaryUpDown$_{-1}$ | -0.021 | 0.152*** | 0.019 | 0.138*** |
| | (-0.63) | (2.59) | (0.42) | (2.74) |
| *Leverage:* | | | | |
| SameFirmAsTreated*BeneficiaryUpDown$_{-1}$ | -0.028 | 0.150*** | 0.014 | 0.144*** |
| | (-0.41) | (2.78) | (0.31) | (2.68) |
| *Private versus Public firms:* | | | | |
| SameFirmAsTreated*BeneficiaryUpDown$_{-1}$ | 0.022*** | 0.113*** | 0.033*** | 0.116*** |
| | (2.88) | (2.98) | (2.85) | (3.25) |
| Establishment-Plan FE | Yes | Yes | Yes | Yes |
| Firm-Year-Plan FE | Yes | Yes | Yes | Yes |
| Observation level | Establishment | Establishment | Establishment | Establishment |

Table 8: **The effect on stock market valuation.** In columns (1) and (2), we report the effect of Five-year Plans on stock market valuation of U.S. public firms. Columns (3)–(8) present how the effects vary across different types of firms. Columns (3) and (4) show the differential effects on U.S. public firms with versus without a China business presence before the release of a plan. Columns (5) and (6) report how the effect varies with a firm's exposure to the beneficiary industries that supply to and source from the treated industries. Columns (7) and (8) present the results indicating the heterogeneous effects across industries with different levels of financial constraint. We incorporate firm-plan fixed effects and year-plan fixed effects for all columns. All variables are defined in Table 1. The $t$-statistics are based on standard errors clustered at the industry level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

| Dependent variable: | $\text{AccumReturn}_{US}$ (1) | $\text{Q}_{US}$ (2) | $\text{AccumReturn}_{US}$ (3) | $\text{Q}_{US}$ (4) | $\text{AccumReturn}_{US}$ (5) | $\text{Q}_{US}$ (6) | $\text{AccumReturn}_{US}$ (7) | $\text{Q}_{US}$ (8) |
|---|---|---|---|---|---|---|---|---|
| Treated | -0.053*** | -0.088*** | -0.069*** | -0.106*** | -0.067*** | -0.110*** | -0.142*** | -0.271*** |
| | (-3.49) | (-4.94) | (-5.00) | (-5.10) | (-5.64) | (-5.52) | (4.75) | (6.24) |
| Treated*$\text{ChinaPresence}_{-1}$ | | | 0.057*** | 0.071** | | | | |
| | | | (5.79) | (2.09) | | | | |
| Treated*$\text{BeneficiaryIndExposure}_{-1}$ | | | | | 0.048*** | 0.072** | | |
| | | | | | (4.87) | (2.24) | | |
| Treated*$\text{LowConstraint}_{-1}$ | | | | | | | 0.112*** | 0.228*** |
| | | | | | | | (4.01) | (5.14) |
| Observations | 57,500 | 57,500 | 57,500 | 57,500 | 57,500 | 57,500 | 57,500 | 57,500 |
| Firm-Plan FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year-Plan FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observation level | Firm | Firm | Firm | Firm | Firm | Firm | Firm | Firm |

Table 9: **The effect on community.** In columns (1), (3), and (5), we report the effect of Five-year Plans on U.S. local community based on the county-year-plan level observations. Columns (2), (4), and (6) present how the effects vary across the adjustment intensity of the firms that operate in a given county. We incorporate county-plan fixed effects and year-plan fixed effects for all columns. All variables are defined in Table 1. The $t$-statistics are based on standard errors clustered at the industry level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

| Dependent variable: | $\log(\text{Employment}_{US})$ | | $\text{Closure}_{US}$ | | $\text{OpioidUseRate}_{US}$ | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| TreatIntensity | -*** | -*** | +** | +** | +*** | +*** |
| TreatIntensity*HighAdjustment | | + | | - | | - |
| County-Plan FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Year-Plan FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Observation level | County | County | County | County | County | County |

**Internet Appendix for the paper**

**"Shareholders vs stakeholders: Within-firm responses to industry shocks"**

Xiao Cen, Texas A&M University

Vyacheslav Fos, Boston College

Wei Jiang, Emory University

## Appendix A. Addressing data limitations of the China Industrial Enterprises Database (CIED)

This paper relies on CIED data to track longitudinal changes in operating and financial variables for a large sample of private and public Chinese firms from 1998 through 2013. The dataset is highly informative, although it may be subject to a number of quality issues (Nie et al., 2012). In this section, we list the major limitations of CIED data raised in Nie et al. (2012) that are relevant to our study and discuss how the limitations may affect our results and how we address these issues.

**1. Missing Indices**. Nie et al. (2012) mention several variables that are subject to missing indices problem for certain years. This issue is relevant to one variable in our tests: subsidies (missing for 2008 through 2010). Subsidy measures are used in Tables 3 to 9 and Table IA1. To ensure that the estimates reported in Table IA1 are not affected by the missing variable for 2008 through 2010, we perform robustness tests using a subsample with a sample period that runs through 2007, which delivers similar results to those reported in Table IA1. For the analysis based on Five-year Plans, we conduct robustness tests based only on industrial policies in the 10th Five-Year Plan as of 2000, the sample period for which does not overlap with the years with missing subsidy information. The robustness tests provide results consistent with those reported in Tables 3 and 4.

**2. Unrealistic Outliers**. Nie et al. (2012) point out outliers among the variables in CEID data. This issue is potentially driven by the misreporting of variables, especially financial variables, by some firms, which is not unexpected considering that not all firms have reliable accounting systems. Because we rely mainly on basic information, such as the number of firms and total employment, the calculation of which is straightforward and does not rely on any complicated accounting procedures, we believe this issue does not have a major impact on our analysis. To further ensure that outliers do not affect the results, we repeat all analyses while trimming the potentially unbounded variables at the 0.5% extremes on both ends, or the 1% extremes on one end, for the variables that are unbounded on only one side. The results of the robustness tests confirm that the findings in the paper are not driven by the outliers among the variables.

**3. Measurement Errors**. Nie et al. (2012) provide several examples of variables that might be subject to measurement errors, which do not include the variables we used. If measurement errors exist, it may potentially affect our results. Because we aggregate the variables to the industry level, however, the data aggregation can automatically reduce measurement errors unless the errors are cross-correlated within the same industry.

**4. Sample selection**. Another concern is that some firms in our sample may not be present in the database for certain years over their lives, because in some years (especially the early years after entry), a firm's revenue may not pass the "above-scale" threshold. This is a major caveat when interpreting changes in the number of firms and employment in a given Chinese industry.

In addition, the sample matching problem raised by Nie et al. (2012) is largely irrelevant to our paper. Nie et al. (2012) point out the difficulty involved in matching the same firm across years and constructing panel data at the firm-year level. This issue arises as a result of the lack of a unique identifier at the firm level and changes in firm names over time. This issue is not expected to affect our paper because our analysis uses industry-level measures and does not rely on within-firm links. Also, the definition ambiguity issue discussed in Nie et al. (2012) does not apply to the variables used in this research.

Table IA1: **The aggregate output of subsidized industries.** In this table we report results indicating the extent to which the logarithm of the aggregate output of the U.S. industry corresponding to an encouraged Chinese industry predicts the size of the subsidy provided by the Chinese government. All variables are defined in Table 1. We incorporate industry fixed effects and year fixed effects for all columns. The $t$-statistics are based on standard errors clustered at the industry level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

| Dependent variable: | *Log Subsidy (nominal)* | | | *Log Subsidy (# of firms)* | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $log(Output_{US,t-1})$ | -0.002 | 0.073 | | 0.045 | 0.039 | |
| | (-0.03) | (0.57) | | (0.82) | (0.57) | |
| $log(Output_{US,t-2})$ | 0.083 | | 0.064 | 0.006 | | 0.044 |
| | (0.70) | | (0.54) | (0.13) | | (0.81) |
| Observations | 1,100 | 1,100 | 1,100 | 1,100 | 1,100 | 1,100 |
| Industry FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes |

Table A2: **The impact of Chinese Five-year Plans on the number of U.S. public firms.** In this table we report results indicating the impact of industrial policies in Chinese Five-year Plans on the number of U.S. public firms in the target industries, corresponding to equation (1). We incorporate industry-plan fixed effects year-plan fixed effects. All variables are defined in Table 1. The $t$-statistics are based on standard errors clustered at the industry level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

| Dependent variable: | $log(PublicFirms_{US})$ |
|---|---|
| | (1) |
| $Post * \text{Treated}$ | -0.032 |
| | (-0.66) |
| N | 1,900 |
| Year-Plan FE | Yes |
| Industry-Plan FE | Yes |