How Do Firms Withstand A Global Economic Shock: Evidence From Within-Firm Responses ☆

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Abstract

China's Five-Year Plans (industrial policies targeting specific industries) displace US production/employment and heighten plant closures in the same industries. The shocks were not anticipated by the U.S. stock market, but firms in the treated industries suffer valuation loss afterwards. Firms adjust by shifting production to upstream or downstream industries benefiting from the boost, or offshoring to government-endorsed industries in China. Such within-firm adjustments offset the negative shocks among firms with pre-existing toeholds in the "beneficiary" industries or production overseas, suggesting a novel role of diversification. Financial access and labor fluidity are instrumental for firms to withstand global economic shocks.

Keywords: Within-firm adjustment, global economic shocks

1. Introduction

U.S. corporations have navigated through an unbroken series of worldwide economic shocks in the 21st century, starting with the Tech Bubble Burst, followed by the global Financial Crisis, and then the COVID-19 Pandemic. Throughout the two decades since the turn of the millennium, a consistent theme has been the escalating rivalry, both in manufacturing and technology, from China. As China surpassed the U.S. to become the foremost nation in manufacturing (in 2010), trade (in 2013), and patents (in 2019), firms in the U.S. have been subject to a series of shocks originated from its archcompetitor.[1] In a way, U.S. firms appear to have been remarkably resilient: the U.S. GDP has more than doubled over this span, the stock market's value has surged by over two and a half folds, and companies have exhibited unprecedented levels of innovation. Such resilience piques our curiosity about the precise mechanisms that empower U.S. firms to withstand the global shocks of the global economic landscape.

A significant body of literature exists on how firms react to financial or product market disruptions. These responses may occur at both the intensive margin, which involves changes in the weights of investment and production across different segments or business establishments, and the extensive margin, which involves setting up operations in new sectors or regions or closing down existing ones. An increasing number of papers use census-based data to investigate economic activities at the business establishment level (e.g., Maksimovic and Phillips, 2002; Tate and Yang, 2015; Giroud and Mueller, 2015, 2019). While this developing literature has largely examined the general efficiency of internal capital and labor markets, it does not emphasize how the internal reallocation of resources and production is motivated by survival instincts in response to global shocks, or how

[1] See, e.g., Autor et al. (2013) for trade shocks from China, and Han et al. (2020) for technology competition between the two nations.

firms' agility in making internal adjustments results in differential outcomes for firms, and its shareholders and employees.

In this paper, we use census-based data to provide the first micro-level evidence on how firms reallocate resources across business units, sectors, and geographic locations in response to an economics shock from China and how these responses affect the outcomes of firms, shareholders, and labor in the focal as well as related industries. The global shocks in this study originate from China's Five-Year Plans, which are the highest level of the central government's industrial policies and identify the key sectors the government encourages and supports. Specifically, the study examines the impact of the Tenth to the Thirteenth Five-Year Plans, which were announced from 2001 to 2016 at five-year intervals. Our study connects establishment-level data from both the U.S. (U.S. Census LBD data) and China (the China Industrial Enterprises Database). The study first validates the nature of the staggered shocks to U.S. firms by demonstrating that the implementation of a Five-Year Plan was followed by a significant production expansion, such as an increase in the number of establishments and level of employment, in the encouraged sectors in China. This expansion crowds out production in the same sectors in the U.S., leading to significant drops in both employment and investments and a notable increase in plant closures.

Although China's Five-Year Plans could be motivated by the conditions and prospects of industries within China, empirical evidence suggests that Chinese government support does not bear any significant 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 anticipate the imminent shocks: U.S. stock markets only re-valued firms in industries directly targeted by a Five-Year Plan ("treated firms") towards the end of the year in which the Plan was published, and the treated firms do not show any slowdown in job postings up to the year of a Plan. Both stock market valuation and desire-to-hire are widely considered to be forward-

looking economic indicators; change in these indicators typically precedes upcoming regime changes. This lack of pre-response supports the premise that the shocks 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 to control firms, evidence shows that employment, investment, and output (on the intensive margin) begin to drop notably one year after the shock, and plant closures (on the extensive margin) follow another year later. This combined evidence validates the Five-Year Plans as industry shocks to U.S. firms, allowing us to explore responses and consequences from within the treated firms or at the plant level.

Firms, as business entities, inherently possess survival instincts: they enact adaptations subsequent to absorbing disruptions and actively seek new opportunities to pivot towards. Our analysis shows that U.S. firms that are in the upstream (or downstream) of the Plan-encouraged industries *and* exporting (or importing) products to (or from) China are indirect beneficiaries of industrial policies in China.[2] We refer to these groups as "beneficiary industries." Some firms in these industries are able to take advantage of the positive spillover effects, particularly if they already have a presence in the beneficiary industries. Indeed we find that these multi-segment treated firms increase investment and employment in the beneficiary industries and experience fewer plant closures.[3] Similarly, firms in "offshorable" industries (Firpo et al., 2011; 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.[4]

[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.

[3]Relatedly, Ahern and Harford (2014) highlight the importance of customer-supplier industry links in firms' boundary adjustment and the propagation of merger waves.

[4]Foreign-owned firms and joint ventures in China not only enjoy public goods as a result of government policies promoting the specific industries, but are often eligible for the preferential governmental policies

To the extent that a firm's presence in associated industries and its operational set-up overseas can be seen as forms of diversification (both sectoral and territorial), our findings cast fresh illumination on the much-studied topic of firm diversification. The prevalent theme in academic research suggests a "diversification discount" stemming from inefficiencies in investment (Lamont, 1997; Shin and Stulz, 1998; Rajan et al., 2000; Ozbas and Scharfstein, 2009), issues of agency (Wulf, 2002; Laeven and Levine, 2007), or overarching governance deficiencies (Hoechle et al., 2012). A limited number of studies question the causality by scrutinizing the endogenous choice to diversify (Campa and Kedia, 2002), as well as measurement errors in valuation and investment opportunity (Whited, 2001).

Whereas the foremost explanation for the diversification discount usually revolves around investment distortions, due to cross-subsidization usually favoring underperforming segments within a conglomerate, our investigation reveals that diversification across related industries could empower companies to respond to shocks by reallocating resources within. Given the significance of adjustment costs (Pindyck, 1982), particularly when venturing into different industries, an existing "toehold" in related sectors enables a company to circumvent initial setup costs and swiftly scale up, thereby gaining an early-mover advantage in competitive landscapes.

It is interesting to note that the adjustments discussed earlier, such as moving into beneficiary industries along the supply chain and offshoring to China, are primarily driven by firms with low financial constraints. Specifically, publicly-traded firms and those with low financial-constraint indices (developed in Hoberg and Maksimovic (2015) and Whited and Wu (2006)) are more likely to make these adjustments. It is notable that this variation is observed among U.S. publicly-traded firms, which are generally considered to have the

(e.g., tax rebates, research grants, and talent recruiting) extended to all firms residing in China.

best access to financing. Such a finding is even more telling about the imperative role played by financial markets in helping firms adapt to a fast-changing world. The cross-sectional relation regarding financial constraints extends to all firms: Public firms adapt more smoothly than private firms (especially those without PE capital backing and public debt access). On the other hand, the role of labor market friction, measured by right-to-work law and unionization rates at the state-year level, is tricky. Strong unions can resist firms' profitable moves to "beneficiary industries," which may leave the current employees behind,[5] but at the same time facing tough labor bargaining makes it more likely that firms will send production overseas. This empirical relation has not been documented before.

It is perhaps not surprising that firm adjustments align with shareholder interests. Although treated firms (i.e., U.S. firms with Chinese peers supported by the Five-Year Plans) as a whole experience a decrease in valuation (measured by Tobin's q and stock returns), a subset of them that are better able to adjust—due to pre-existing conditions—can largely offset the negative valuation impact, by reallocating production either to upstream/downstream industries that benefit from the boost of production in China in the focal sector, or, offshoring to the focal sector in China. In other words, well-financed firms with nimble sectoral and territorial layouts can adapt to the adverse shock of production displacement due to strengthened competition from China so that their shareholders emerge unscathed. For the same reason, suppliers and customers experience varying outcomes as they experience positive or negative impacts from the original shock rippling through the supply chain. In the end, well-adjusted firms do not suffer in terms of valuation, investment, and employment despite the initial negative shock, which we present as micro evidence of our economy's resilience to global shocks.

[5]In our sample, about 90.2% of the plants in the beneficiary industries owned by the same firm are in a different county from the focal plant, a high hurdle for labor mobility.

Our study connects two strands of the economics and finance literature: the literature on within-firm resource reallocation and firm diversification (e.g., Stein, 1997; Lamont, 1997; Shin and Stulz, 1998; Rajan et al., 2000; Whited, 2001; Campa and Kedia, 2002; Campello, 2002; Maksimovic and Phillips, 2002; Ozbas and Scharfstein, 2009; Giroud and Mueller, 2015; Tate and Yang, 2015) and the literature on global economic shocks (e.g., Eaton and Grossman, 1986; Autor et al., 2013; Acemoglu et al., 2016; Pierce and Schott, 2016; Bloom et al., 2016; Handley and Limão, 2017; Antras et al., 2017; Autor et al., 2020). Economic shocks from China have been studied in the literature that mostly focuses on documenting the winners and losers and adjustments in response to the shock at the firm, region, or industry level. Deviating from the literature, our study documents the within-firm resource reallocation in response to the shocks using establishment-level data and reveals the nuanced, varying impact on firms due to firms' sectoral and geographical positioning. Our paper also adds to the debate around firm diversification by speaking to the role of firm sectoral and geographical diversification in enhancing business resilience to global shocks.

There is an ongoing policy debate on potential measures to help domestic firms and the broader economy withstand global shocks, including a reintroduction of industrial policies and trade policies in the U.S., a prominent example being the CHIPS Act of 2022.[6] A crucial input to this discussion is understanding how firms respond to global shocks, particularly to policy-driven changes in the global competition landscape. While there is a growing body of literature on the impact of global shocks on firms and employment, the micro-level evidence on within-firm responses to global shocks remains scant. This paper aims to fill this gap and to shed light on this macro question by providing evidence from the micro

[6]The Act, named "the Creating Helpful Incentives to Produce Semiconductors and Science Act of 2022," pledges $52.7 billion in government-led investment in domestic semiconductor manufacturing and exemplifies policy endeavors to boost U.S. competitiveness, innovation, and national security.

level of business units.

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 how the shocks and the adjustments firms made in response affect firms' operating outcomes and shareholder value. Finally, Section 6 concludes.

2. Data and Sample Overview

2.1. Business establishment level data in the U.S. and China

This study builds on various establishment-level databases from both the U.S. and China 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 merge the China Industrial Enterprises Database (CIED) with the U.S. Census Longitudinal Business Database (LBD) using the International Standard Industrial Classification (ISIC) codes as a bridge; the sample period runs from 1998 through 2013.

The LBD at the U.S. Census Bureau is an administrative business dataset in the U.S. It 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 the 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 manufacturing firms with revenue above 20 million RMB (before 2009, above 5 million RMB)[7] 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. The database also includes information about government subsidies. Subsidy income, provided by either the central or a local government, takes various forms, including tax rebates, financial subsidies, and incentives for new products and technological innovation, including R&D grants.[8] Earlier studies that built on the database include Hsieh and Klenow (2009) and Song et al. (2011).[9] 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 classifications 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; also, 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 in tracking activities at the business-unit level. While an establishment is a production

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

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

[9] 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.

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 database 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.

2.2. Economic shock: The Five-Year Plan of China

The global economic shock onto U.S. firms studied in this paper originated from China's Five-Year Plans, which are the highest level of the central government's industrial policies starting in 1953. A key elements is that each Plan identifies the key sectors the government encourages and supports. The Plans of particular interest to us are the 10th, 11th, 12th, and 13th Five-Year Plans that came into effect in 2001, 2006, 2011, and 2016, respectively. We hand-collect data on the Five-Year Plans from official documents provided by the State Council of China, following 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 a Plan and receiving increased government post-Plan subsidies. More specifically, the treatment requires that the magnitude of subsidy increases from 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.

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 are at the industry-month level.

2.3. 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, all in manufacturing sectors.[10] The merge between LBD and ASM/CMF data yields 1,245,000 unique establishment-year observations on the U.S. side.[11] To construct variables concerning U.S. firms' and industries' economic activities, we also aggregate the establishment-level data for a given 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,[12] 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.

The summary statistics are reported in Table 2,[13] 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 1,503 Chinese firms. The average number of employees is 158.2 (437.3) in the U.S. (China). It is not surprising that Chinese firms are generally more labor intensive. Summary statistics for U.S. establishments are comparable to those reported in earlier studies (e.g., Giroud and

[10]The number of unique firms on the Chinese side is estimated based on the number of unique firm names in the dataset.

[11]Due to disclosure restrictions imposed by the U.S. Census Bureau, we are limited to reporting a maximum of four significant figures for any given statistic or coefficient based on restricted-use data provided by the U.S. Census Bureau.

[12]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.

[13]In light of the 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 25th pseudo-percentile is defined as the mean value for the subsample between the 24th and 26th percentiles.

Rauh (2019), Kim and Ouimet (2014)). For instance, the number of employees in a U.S. establishment is around 158 in our sample and is between 49 and 311 for Giroud and Rauh (2019). 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 of Chinese establishments, is 12%, which is slightly lower than the leverage 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 (19.37%) is higher than the average for the corresponding U.S. industries (8.85%). 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, 12.7% of firms operating in Chinese industries receive some type of subsidy, and average industry-level subsidies in a given year amount to RMB 629 million ($83.1 million) or about 0.2% of the annual sales in a given industry. Government subsidies are not unique to China; in fact, they are common in most major economies.[14] However, subsidies on the U.S. side are not recorded in the Census database and are not the focus of our study.

Building our study on comprehensive and mandatory national surveys of business establishments in both countries is crucial to overcoming 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

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

China's National Bureau of Statistics, employment in all public domestic firms in 2015 accounted for 2.4% of total employment in China, while the corresponding shares in earlier years were even more negligible.

3. China's Five-Year Plans as Shocks to U.S. Firms

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

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

$$y_{kt} = \theta \; Treated_{ktp} + \alpha_{kp} + \alpha_{tp} + \varepsilon_{ktp}. \tag{1}$$

In the equation above, y_{kt} is the logarithm of the number of firms (employment) in a Chinese industry k in year t. The key variable, $Treated_{ktp}$, is an indicator variable that takes the 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 $[t-4, t]$. α_{kp} are industry-Plan fixed effects, and α_{tp} are year-Plan fixed effects. Our empirical strategy is similar to that used by Cengiz et al. (2019), among others. 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 a shock, the treated industries in China expand to a greater extent than the non-treated industries do 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 increases in the non-treated industries.

[Insert Table 3 here]

Our overall results suggest that the Plans have the desired effects on the encouraged industries in China. Such increased capacity may exert a substitutive effect on U.S. production, which we analyze next.

3.2. Production and employment outcomes for U.S. establishments

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 stacked panel data consisting of all relevant establishments in the U.S. over the ten years around each Plan:

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

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

The results shown in Panel B of Table 3 indicate that there are significant negative effects on U.S. establishments after the same industries become encouraged by one of China's Five-Year Plans. The employment and total capital expenditure of an average U.S. establishment in a treated industry decline by about 5.1% and 6.1%, respectively. We find changes on the extensive margin as well: the likelihood of an establishment

closure increases by one percentage point after an industry is included in a Five-Year Plan (relative to the unconditional closure probability of 8%). The output of U.S. establishments decreases by about 3.6%.[15] Overall, the evidence indicates a significant displacement of U.S. establishments' economic activity by Chinese firms' boosts in production after their shared industry is targeted by a Five-Year Plan.

It is worth noting that the analyses are performed at the business-establishment level as opposed to at the firm level (using standard databases such as Compustat). The latter could have led to materially different inferences. In fact, we discover that the number of Compustat firms does not exhibit significance drop post-shock.[16] In other words, our key finding that China production shocks predict reductions in the number of U.S. factories could not have been revealed using standard firm-level data.

3.3. Affirming the impact of Five-Year Plans

3.3.1. Pre-trends of key variables

We wish to reiterate that estimates derived from regression (2) can be interpreted as causal only if 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 this parallel-trend assumption is inherently non-testable, we shed light on the premise by examining preexisting 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

[15]The impact on U.S. manufacturers in the baseline analyses is overall comparable in magnitude to the effects of other shocks in the literature. For example, Autor et al. (2013) reveal that Chinese import penetration results in an 8.5% reduction in U.S. manufacturing employment. Pierce and Schott (2016) show the normalization of trade with China implies a relative decline in manufacturing employment of about 15% (or 0.15 log points); Bernard et al. (2006) find that import penetration from low-income countries is associated with 2.2 percentage point increase in the probability of plant closure. Trefler (2004) shows Canada-U.S. Free Trade Agreement leads to a 5% employment loss for the manufacturing sector. Adelino et al. (2017) show that a one-standard-deviation change in local income growth due to exogenous investment opportunity shocks leads to employment creation equivalent to 1.6% of the total employment in non-tradable sectors of a commuting zone.

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

control groups by estimating the following regression at the establishment(i)-year(t)-Plan(p) level:

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

We estimate the regression based on the same stacked panel data that we used with equation (2). $Treated^{\tau}_{i(k)tp}$ is a dummy variable that equals one if an establishment belongs to an industry (k) included in a Five-Year Plan (p) τ^{th} ($-\tau^{th}$) year before (after) year t and is zero otherwise. The definitions of other variables are consistent with those included in equation (2). The coefficient θ_τ measures the gap between the treated and control industries in economic activities during the τ^{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. In column (5), the outcome variable is the output for establishments. The insignificant coefficients on $Treated^{\tau}$ and the lack of a visible trend 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, the coefficients on $Treated^{\tau}$ in post-shock periods are all significant no later than $\tau = 2$, indicating that this kind of policy shock casts a negative shadow on establishments in the U.S. in terms of employment, investment, the number of active and surviving establishments, and output. The evidence that employment, investment,

and output shrink (in year $t+1$) before the closing of establishments (in year $t+2$) is also a plausible sequence if changes on the intensive margin precede those on the extensive margin.

3.3.2. Pre-trends of leading (forward-looking) economic variables

It could still be argued that the absence of preexisting trends is not sufficient for a full parallel trend conclusion: The 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 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.[17] 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. We consider two common measures: stock-market valuation and firms' desire to hire. The results are reported in columns (6) to (8) of Table 4.

The first set of leading indicators, stock returns and Tobin's Q values, exhibit parallel pre-trend between treated and control firms. 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 of 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

[17]If the Chinese government actually targets industries in which the U.S. enjoys a *growing* advantage based on their natural growth cycles, our argument is stronger because it would be more difficult to obtain our current results.

also have been priced. In other words, if certain industries in the U.S. were expected to be out-competed by their peers in China even in the absence of the Plans, the stock-market valuation should already reflect that negative prospect prior to Plan implementation. 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 is, in a timely way, processing new information gleaned from policy announcements.

The second forward-looking economic indicator, firms' desire to hire, come from Burning Glass, a 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, newsletters, and agency reports, and cover the year 2007, and 2010–2020 (through September 2020). The data contains more than 100 million online job postings and is believed to capture the near-universe of jobs posted online during the sample period.[18] For column (8) of Table 4 we conduct the outcome variable to be $Job\ Postings_{US}$, defined as the total number of job postings for all firms in an industry in a given month. Job postings capture only the demand side, instead of the equilibrium level, of employment, and therefore reflect firms' expectations of future growth. The results indicate that job postings for treated and control groups do not diverge before the shock, but treated firms drop postings significantly relative to control firms after a Plan is implemented. Such a difference-in-difference suggests that U.S. firms did not anticipate the relative weakening of the industries that would be targeted by one of China's Five-Year Plans, but quickly modified their expectation afterwards.

We note that it is generally considered implausible by the vast economics literature to assume that a government can process information to predict and anticipate the evolution of economic activities in a way that outperforms the aggregate wisdom of the securities

[18] A growing body of research utilizes Burning Glass data (e.g., Acemoglu et al., 2022; Hershbein and Kahn, 2018). We transfer the 6-digit NAICS industry classification used in Burning Glass into the 4-digit ISIC using the concordances provided by U.S. Census Bureau.

market and firms. In fact, the ability to aggregate information to guide resource allocation is considered the fundamental strength of markets over government-driven alternatives. Thus, the most likely explanation for the findings reported in Table 3 is the real impact of a global economic shock on U.S. firms.

4. Withstanding global shocks: Within-firm adjustment by U.S. firms

The previous section shows that China's Five-Year Plans constitute a negative global economic shock on U.S. firms whose same-industry peers in China are expanding. However, these firms are not passive players; instead, they should strive to overcome the shocks through operational and financial adjustments. The establishment-level data at our disposal allows us to examine such adaptations made within the firm.

4.1. Adjustment to upstream and downstream industries

4.1.1. Upstream and downstream industries post shock

Similarly to most economics shocks, the Five-Year Plans could also create winners among some U.S. firms, for which two types of industries emerge as front candidates. Table 3, Panel A shows that booms follow Plans in industries in China that are encouraged by the Plans. Based on the input-output relations, we expect industries that are upstream or downstream of the focal industries to benefit as either their outputs are in higher demand or their inputs become more abundant, especially if they export significant volumes of outputs to China or source significant volumes of inputs from China.

We thus evaluate the following regression based on establishment-year-Plan level stacked panel data that only includes nontreated industries:

$$
\begin{aligned}
y_{it} &= \theta_1 \; UpstreamToTreated_{i(k)tp} * ExportToChina_{-1,i(k)p} \\
&+ \theta_2 \; DownstreamToTreated_{i(k)tp} * ImportFromChina_{-1,i(k)p} + \alpha_{ip} + \alpha_{tp} + \varepsilon_{itp}.
\end{aligned} \tag{4}
$$

$UpstreamToTreated_{i(k)tp}$ ($DownstreamToTreated_{i(k)tp}$) 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 (where establishment i belongs) is nontreated and its maximum percentage of output supplied to (input sourced from) all treated industries in "year -1" falls in the top tercile among all nontreated industries that supply to (source from) a treated industry. The input-output relation is based on Industry Economic Accounts (IEA) released by the Bureau of Economic Analysis. $ExportToChina_{-1,i(k)p}$ 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. $ImportFromChina_{-1,i(k)p}$ is a dummy variable equal to one if industry k mainly sources from a treated industry whose downstream industries have an above-median average import intensity from China (the percentage of input sourced from China) in "year -1." The import-export measures are constructed based on the United Nations Industrial Development Organization (UNIDO) database. Importantly, we include establishment-Plan fixed effects to control for invariant heterogeneity across establishments and also include 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. establishments in upstream exporting industries experience a 1.8% growth in employment and a 2.2% growth in investment post Five-

Year Plans relative to establishments in industries unrelated to the Plans; both increases are significant at the 1% level. Moreover, we find that U.S. establishments in upstream exporting industries experience a −0.4% incremental likelihood of establishment closure. For the establishments in U.S. downstream importing industries, the effects are similar at 2.0%, 2.1%, and −0.4%; all are significant at the 1% level. Based on these findings, we term these two groups of industries as *Beneficiary* industries for the analyses in the next section.

The fact that the same shock can create winners and losers corroborates findings from recent studies along novel 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. Such a finding per se is not the focus of our study, but serves as a premise to analyze within-firm adjustments in response to the newly emerged bright spots.

4.1.2. Within-firm reallocation of production to beneficiary industries

Our next focus is on uncovering within-firm reallocation of resources. We first partition all establishments into three groups. 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, investment, and output. The second group consists of establishments that are not in the *Treated* group but belong to firms that have at least one establishment in the treated group. These establishments are called *SameFirmAsTreated*.

The third group is the residual category of establishments that are not "sibling plants" to the treated ones.

We then further partition the *SameFirmAsTreated* group into three more refined groups based on their 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 this group are expected to benefit from China's industrial policies because they are suppliers to firms in industries that are encouraged by these policies. Similarly, $SameFirmAsTreated * BeneficiaryDownstr_{-1}$ is a group of establishments that belong to *SameFirmAsTreated*, are in an industry that is downstream to a treated industry, and have a relatively high import intensity from China. This group benefits from being customers of boosted supply from China. Finally, $SameFirmAsTreated * NonBeneficiary_{-1}$ contains all other establishments that belong to the $SameFirmAsTreated$ group. Establishments in this group are not expected to directly benefit from China's industrial policies. All the beneficiary status variables carry the time subscript "-1" to denote that such status is ex ante, recorded 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:

$$\begin{aligned} y_{it} &= \theta \text{ Treated}_{itp} + \delta_1 SameFirmAsTreated_{itp} * BeneficiaryUpstr_{-1,ip} \\ &+ \delta_2 SameFirmAsTreated_{itp} * BeneficiaryDownstr_{-1,ip} \\ &+ \delta_3 SameFirmAsTreated_{itp} * NonBeneficiary_{-1,ip} + \alpha_{ip} + \alpha_{tp} + \varepsilon_{itp}. \end{aligned} \tag{5}$$

The results are reported in Table 6. The coefficients of $Treated$ in columns (1) through

(3) merely confirm 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]

Key to our interest is the 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 the winning industries, which allows them to pivot toward the bright spots more quickly or at a lower cost than their disrupted peers without such toeholds. If such firms do leverage their toeholds by moving resources and production from the distressed to the booming sectors, we should observe that the "sibling plants" in beneficiary industries expand significantly, relative to plants without an association with the treatment.

Such a relation is confirmed by columns (1) through (3) of Table 6, where a comparison is made between the plants of interest and all plants unaffiliated with a treated firm. Establishments that are expected to benefit from China's industrial policies indeed experience significant increases in employment (3.2%-5.1%) and investment (5.2%-6.8%). Moreover, the likelihood of an establishment closure is 1.3%-1.5% 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. The regression also incorporates year-Plan fixed effects, taking out the unconditional effects on all establishments from the cycles of the Five-Year Plans. In the end, the results in the first three columns of the table indicate that firms with disrupted establishments as well as establishments in beneficiary industries experience a decrease (increase) in production in the former (latter). Their other

establishments maintain a neutral level of changes relative to the establishments unaffiliated with a treated establishment.

Because they are full-sample regressions, the first three columns of Table 6 set the reference category to consist of establishments that are themselves not in the treated industry and that are without sibling plants in the treated industries. What we can go one step further is to demonstrate a within-firm relocation of production and resources. 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 subsample 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, α_{tp}, with firm-year-Plan fixed effects, α_{jtp}, for the purpose of extracting within-firm variation in outcome variables. In the full sample analysis presented in columns (1) through (3), in contrast, 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 merely a better position relative to the decline of other groups. In the latter analysis, incorporating firm-year-Plan fixed effects helps control all potential confounders at the firm-year level and therefore helps rule out the possibility that the effect can be explained by concurrent patterns. For example, this rules out the possibility that the treated firms with operations in beneficiary industries experienced overall growth in non-treated industries and firms without such an operation experienced

overall shrinkage around the shock. The results, shown in columns (4) through (6), indicate that firms indeed reallocate resources (employment and investment) to establishments that are expected to benefit from China's industrial policies. These establishments also enjoy significantly higher longevity.

The comparison between the first and last three columns of Table 6 further indicates that the inclusion of treated establishments in the sample does not drive the magnitude or the significance of the results, suggesting real spillover effects. The positive spillover provides firms opportunities to overcome a negative shock, for which their preexisting sectoral distribution of business establishments plays a significant role.

4.2. Offshoring

In addition to pivoting to beneficial industries, treated firms may also choose to reallocate production geographically, i.e., to offshore, especially to China, where the focal sector enjoys government support.[19] To test this hypothesis, we quantify the intensity of offshoring at the firm-year level with two measures. The first and main measure is constructed by counting sentences that mention a manufacturing site or an operation facility in China in a firm's 10-K for a given year. Using a method similar to Hoberg and Moon (2017) and Hoberg and Moon (2019), we extract all sentences in a 10-K that include "China" and at least one production activity keyword. Sales and distribution centers do not count as offshoring in our test.[20] We then manually process the information to code the variable at the firm-year level.

[19]Government support from the Plans is usually extended to all enterprises in China including foreign-owned or joint ventures. Foreign Direct Investments often enjoy additional preferential policies if they are export-oriented or involve technology transfer (e.g. Long, 2005). Some studies show that foreign-owned firms that operate in China have a higher likelihood of receiving positive subsidies from the Chinese government than non-SEO Chinese firms (e.g., Aghion et al., 2015).

[20]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.

Based on our textual analysis, 36% of US public firms mentioned China operations in a year, and such a firm on average mentions its China manufacturing sites 8 times in a 10-K. Column (1) of Table 7 shows that firms in industries disrupted by the Plans are indeed significantly more likely to dial up China-offshoring intensity from their pre-Plan periods relative to other firms. On average, disrupted firms' discussions of China operations increase by about 5% in response to a Plan relative to the firms in control industries.

[Insert Table 7 here]

The second measure for offshoring intensity by U.S. firms to China is at the industry-firm level, counting the percentage of firms that are foreign-owned but excluding ownership that could be traced to the Greater China region (including Hong Kong, Macau, and Taiwan). A large share of such foreign-owned firms originate from the U.S.,[21] hence the measure is a proxy for U.S. firm offshoring intensity. Column (2) of Table 7 again shows that the treated industries witness significant growth of foreign-owned enterprises in China. Because the dependent variable is in percentage, and because the regression incorporates industry-Plan and year-Plan fixed effects, the significant positive effect suggests that the "net birth" of foreign firms outpaces domestic ones in the treated industries in China post Plans.

4.3. Role of financial constraints and human capital frictions

The previous two sections show that U.S. firms, as a group, are adaptive to facing negative shocks. They pivot into sectors that enjoy positive spillovers from the shocks, or relocate production in sectors embracing the negative shocks to China. Both reallocation of resources and relocation of production (especially to overseas) can be a costly procedure,

[21] According to Huran Foreign and Hong Kong/Taiwan/Macau Companies in China 2021 report, U.S. accounts for 34 of the top 100 foreign firms in China (ranked by China sales).

requiring non-trivial capital expenditure, logistic planning, and employee severance or retraining. We thus conjecture that binding financial constraints and human capital frictions can limit firms' adaptation to global economics shocks.

To evaluate the role of financial constraints, we estimate the following regression specification separately for subsamples of firms with high and low constraints:

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

The variable $BeneficiaryUpDown$ equals one if either of these two variables is positive: $BeneficiaryUpstr$ and $BeneficiaryDownstr$. All other variables are as in equation (6). We start by presenting four sets of results based on four financial constraint measures: the HM (Hoberg and Maksimovic, 2015) index, the WW (Whited and Wu, 2006) index, leverage, and being a private firm (as opposed to a public firm).[22] A firm-year is considered financially constrained if it falls into the top quintile of the financial constraint indices or is a private firm.

The results are reported in Panel A of Table 8. Across all four measures of financial constraint, we find that firms with less binding financial constraints reallocate resources more aggressively to establishments that are likely to benefit from China's industrial policies. For all four measures, the coefficients on $SameFirmAsTreated *$ $BeneficiaryUpDown_{-1}$ of the high- and low-constraint groups are significantly different

[22]Based on Hoberg and Maksimovic (2015), the HW measure is based on the scoring of 10-K text, which captures the delayed investment constraint of firms. Buehlmaier and Whited (2018) construct a financial constraint measure using textual analysis that builds on the HM measure. Based on Whited and Wu (2006), the 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 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. Internet Appendix Table A3 shows that we obtain similar results when using the Size-Age-based measure (Hadlock and Pierce, 2010) of financial constraints and the KZ (Kaplan and Zingales, 1997) index.

at the 10% or 5% level. In fact, changes in employment and investment for financially constrained firms are insignificant when we use the HM index, the WW index, and leverage. In contrast, changes in employment and investment for financially unconstrained firms are significant across all measures of financial constraints. Arguably, a small subset of private firms that are PE-financed or able to issue public debt are not as financially constrained (Bernstein et al., 2019). We thus compare private firms along these two types of sorting in the last two rows of Panel A. Again, PE-backed and public debt-issuing private firms respond significantly more strongly to opportunities. The last two columns of the table further show that establishments in the beneficiary industries are significantly more likely to survive if they are affiliated with less financially constrained firms.

[Insert Table 8 here]

Both capital and labor are essential inputs to any production function. Hence human capital should play a similar role. There are two sets of measures we consider, measuring labor market frictions and adaptability of firm executives. For the former, we consider both right-to-work law coverage and average unionization rates (Calmfors and Driffill, 1988; Falato and Liang, 2016; Tuzel and Zhang, 2017; Almeida et al., 2022). Both measures are at the state-year level. Table 8, Panel B shows that although firms in right-to-work states or in lower (below median value) unionization states (both are "low labor friction" states) reallocate to beneficial sectors more actively than firms in states in the other categories, both subsamples exhibit significantly positive adjustments. The differences between the two subsamples is statistically significant at the 10% level.

At the firm leadership level, we proxy a firm's ability to adapt promptly to shocks and evolving situations with the average tenure of the boards and tenure of CEOs. Brochet et al. (2021) show that long-tenured CEOs are less adaptable to changes. Bebchuk and Cohen (2005) show the detrimental effects of entrenched boards of directors. We sort firms

into high and low CEO tenure as well as into high and low average director tenure, and hypothesize that firms with low-tenured leadership are more responsive to economic shocks. Results in the last two rows of Table 8 confirm such a hypothesis: firms with low-tenured leadership are more responsive to the shock.

A similar pattern with respect to financial constraints and leadership entrenchment prevails for firm adjustment in the form of offshoring. Results in column (1) of Table 9 suggest that the increase in China-offshoring activities is mainly driven by the group of treated firms with low financial constraints as defined by the HM index. Further, column (3) suggests that low-tenured boards are associated with significantly more responsive off-shoring actions. Perhaps surprisingly, column (2) of the table suggest that Plan-disrupted firms with higher exposure to right-to-work law are *less* likely to offshore. Using unionization rates as a proxy for labor friction yields similar results, i.e., firms in low unionization states are significantly less likely to move production to China (Internet Appendix Table A4). Resorting to foreign firms (excluding Greater China) presence in China as an alternative proxy for offshoring intensity produces consistent results in all specifications.

Recall that firms in states without right-to-work law or with high-unionization rates face more social resistance and legal challenge in reducing employment *if* they stay (see Table 8). Unions, however, apparently do not deter firms from uprooting and moving offshore—which results in a larger scale of employment termination. Our results thus indicate that firms facing increased competitive pressure and wage demands, usually from strong labor unions, resort to offshoring, which creates a threat point for labor bargaining. Previous research (e.g., Antràs et al., 2006) models offshoring as a plausibly credible threat point in labor bargaining, but such a relation has not been empirically tested. The contradiction we demonstrate empirically—that labor unions deter firms from pivoting

to a different sector but fail to stop firms from moving to a different country, or even make them more likely to do so—is intriguing and contributes novel empirical evidence to the literature.

5. Can Firms Withstand Shocks: Firm Outcomes and Shareholder Returns

The previous section shows that U.S. firms do not passively embrace the shock from China's industrial policies. Instead, firms re-optimize in sectoral and regional allocation of production and investments, in ways that can be uncovered only using within firm data. For example, Table 6 documents how firms reallocate within the enterprise in order to weather an economic storm or benefit from a new investment opportunity. An important next question is to what extent such adjustments allow firms to overcome the initial negative shock. This section addresses this question using firm-level metrics that track both operating outcomes and shareholder returns.

5.1. Real outcomes of adaptive firms

The previous section shows that firms' ability to make adaptive changes is facilitated by their preexisting advantageous positions, including internal conditions and external conditions. In this section, we analyze the shock impact on the treated firms, interacting with these pre-existing conditions. Specifically, we run the following regression at the firm(j)-year(t)-Plan(p) level for all firms in our sample including both public and private 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 the equation above, the coefficient associated with the independent variable $Treated_{jtp}$ captures the unconditional impact of the shock from China's Five-Year Plans

on treated firms. The key variable of 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 year has its Plan-specific fixed effects.

The results are reported in Table 10. Panel A is focused on internal conditions. Panel B is focused on financial and labor frictions. The first row in each panel echoes Table 4: the Five-Year Plans exert an unconditional negative impact on the treated firms in their operating performance. The interaction terms in Panel A reveal that internal conditions have a profound effect on how the shock affects US firms.

[Insert Table 10 here]

The first variable in Panel A, $ChinaPresence_{-1}$, is an indicator variable of whether a company has a production or operating presence in China, based on textual information in firm 10-K filings. The procedure identifies 15.6% of U.S. public firms as having a significant production/operations presence in China in 1998, with the percentage rising to 51.3% by the end of 2013. Columns (1) to (3) show that a business presence in China exacerbates the effect and leads to greater cuts in employment and investments. More specifically, a treated US firm with a China production presence experiences a decline in employment, investment, and the number of establishments that is 66%–82% larger than treated firms without such a China presence.

The second variable capturing a firm's ex ante ability to adjust is its preexisting exposure to the beneficiary industries (as defined in Section 4.1.2). The indicator variable $BeneficiaryIndExposure_{-1}$ is coded as one if the firm, in the year prior to a Plan announcement, owns at least one plant in an industry that is upstream (or

downstream) of the treated industries and exports to (or imports from) China at a high level. Columns (4) to (6) show that the exposure to beneficiary industries mitigates the negative effect on employment and investments of U.S. firms. Around 15% of the treated firms have an establishment in a beneficiary industry. The coefficients on $Treated * BeneficiaryIndExposure_{-1}$ suggest that having toeholds in beneficiary industries before the shock lowered the negative impact on firms' operating outcomes by 78%–89%.

The third interactive variable, $LowBoardTenure_{-1}$, which proxies for leadership adaptability, is also associated with more favorable impacts. Columns (7) to (9) show that the firms with leadership adaptability above the sample median experience a negative effect on employment, investments, and the number of establishments that is 27%–39% smaller than other treated firms.

Panel B shows that financial and labor frictions also have a profound effect on how the shock affects U.S. firms. First $LowConstraint_{-1}$ is an indicator variable equal to one if a firm is in the bottom four quintiles of financial constraint using the HM index (Hoberg and Maksimovic, 2015). Columns (1) to (3) indicate that low financial constraints reduce the negative effects of the shock on employment and investments. Notably, the magnitude of the mitigating effect is substantial—a decrease of financial constraints from 90 percentile to 40 percentile helps lower the negative effect by more than three quarters.

The next two interaction variables capture labor frictions. $LowUnionization_{-1}$ is an indicator variable showing that the average unionization rate of the states that host a firm's establishments is below-median during the year before the shock. RTW_{-1}, is an indicator variable showing that the average exposure to right-to-work laws in the hosting states of a firm's establishments is below-median. The results in columns (4) to (9) show that firms experience *smaller* cuts in investments and employment when labor frictions are

weak. This result implies that weaker labor frictions can be beneficial for a firm's labor force because they allow firms to adjust in response to a global shock, which partly helps firms preserve their ability to provide jobs. In other words, when firms face global shocks, lowering labor frictions can potentially facilitate firms to grow the pie for all stakeholders including their labor force.

5.2. Valuation of firms adapting to Plan-related shock

For publicly traded firms, we are able to investigate whether firms' adaptive changes neutralize the unconditional negative financial effect of Five-Year Plans on shareholders in targeted industries. We resort to the same regression as in (8) except the dependent variables (y_{jtp}) are shareholder return (cumulative stock returns over the period starting 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 investor/shareholder welfare. The set of independent variables includes variables used in the previous section, as well as a variable controlling for firm business diversification. This is because reallocating production to spillover sectors invariably changes segment diversification within a firm, which, on its own, has valuation implications (e.g., Rajan et al., 2000; Campa and Kedia, 2002; Villalonga, 2004).[23]

Table 11 reports the results. The coefficient associated with $Treated_{jtp}$ confirms the unconditional negative impact of the shock from China's Five-Year Plans on treated firms. We next turn our attention to interaction variables, capturing the role of economic conditions that make firms *a priori* adaptive. Columns (1) and (2) show that firms with a preexisting presence in China are able to offset between two-thirds and four-fifths of the negative impact suffered by treated firms that do not have a presence in China, presumably

[23]We obtain similar results when we do not control for segment diversification within a firm.

because existing establishments in China allow firms to offshore promptly following a shock. Thus, whereas the presence in China enhances negative effects of the shock on employment and investments in U.S. establishments, it mitigates the negative effect on shareholders. Columns (3) and (4) show that firms with a preexisting exposure to the beneficiary industries at the time of the shock are able to eliminate around two-thirds of the negative impact on treated firms without this advantage. Around 30% of the treated public firms have an establishment in a beneficiary industry. Finally, columns (5) and (6) show that firms with more short-tenured boards are able to offset 25% to 36% of the valuation loss relative to peers with long-tenured boards.

[Insert Table 11 here]

Panel B repeats the analysis with financial and labor conditions. The first two columns of Panel B show that firms with weaker financial constraints recover over 80% of the negative valuation effect incurred by the more constrained treated firms. The next four columns show that low union presence is associated with significantly less valuation loss based on the Q measure but no significant difference with respect to stock returns. Presence of right-to-work laws, RTW_{-1}, exhibit qualitatively similar results as low unionization states.

Overall, the six proxies for adaptability are associated with less value loss. In particular, pre-exiting toeholds in China and in beneficiary industries, as well as adequate access to financing, are particularly powerful enablers for firm adaptation, such that firms in favorable conditions based on these three measures do not experience significant value loss. That is, the sum of the two coefficients in each of columns (1) to (4) of Panel A and columns (1) and (2) in Panel B is not statistically different from zero.

To summarize, Table 11 shows that firm adjustments are aligned with shareholder interests. Though treated firms (i.e., U.S. firms whose same-industry peers in China are sup-

ported by Five-Year Plans) as a whole incur valuation discount and shareholder return loss, the subset of them that is 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.[24] In other words, when facing an adverse shock of production displacement (by the strengthening of competitors in China), shareholders of well-financed firms with nimble sectoral and territorial layouts come out nearly unscathed.

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, employment, and output, but a subset of firms do not experience valuation discount or lower shareholder returns because they are able to make adaptive adjustments, including offshoring to China or moving production to upstream or downstream industries that can benefit from booming focal industries in China. These firms' adjustments are facilitated by the financial markets. Our study provides fresh micro-evidence of U.S. firms' resilience to global economic shocks, and novel perspectives on the cost and benefit of firm diversification.

[24] This finding also adds to the continued discussion on the benefits and costs of firm diversification and vertical integration (e.g., Stein, 1997; Whited, 2001; Schoar, 2002; Hann et al., 2013; Crouzet and Mehrotra, 2020; Hansman et al., 2020).

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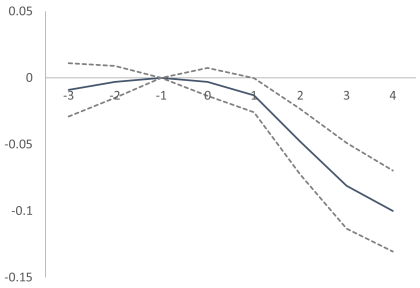
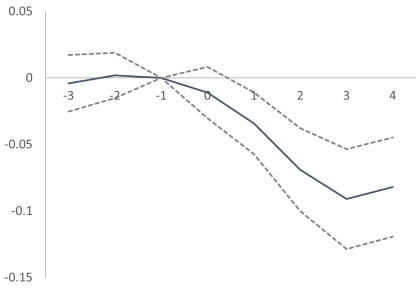
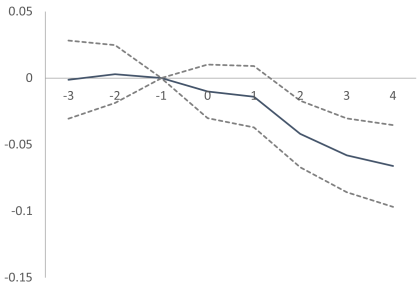


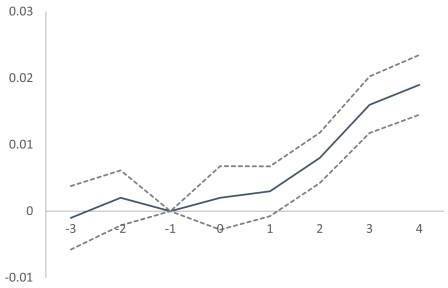
(a) The employment of U.S. establishments around a Five-Year Plan.



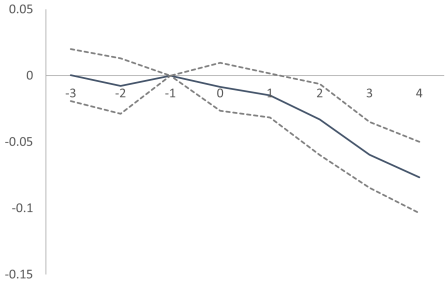
(b) The investment of U.S. establishments around a Five-Year Plan.



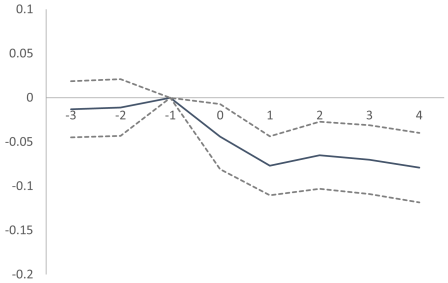
(c) U.S. establishments operating in an industry around a Five-Year Plan.



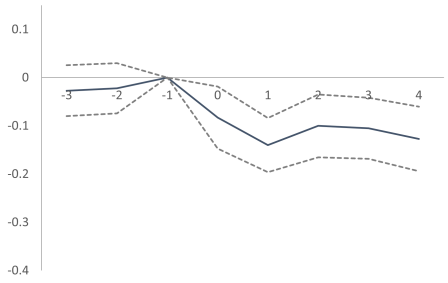
(d) The likelihood of closure of U.S. establishments around a Five-Year Plan.



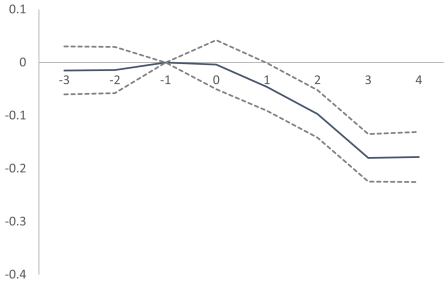
(e) The output of U.S. establishments around a Five-Year Plan.



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



(g) Cumulative stock returns of U.S. firms around a Five-Year Plan.



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

Figure 1: **Outcome dynamics around releases of China's Five-Year Plans.** In this figure we present in graphic form the outcome dynamics around the releases of 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 U.S. establishment experiences closure during a given year and zero otherwise.
$Output_{US}$	The total output of an establishment in the U.S. in a given year. The output measure 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).
$AccumReturn_{US}$	The cumulative stock returns of a U.S. 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.
$Treated$	In all establishment-level analyses, $Treated$ is 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 compared to 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 Panel A of Table 3 and Table A2, $Treated$ is defined at the industry level, equal to one if an industry is encouraged in the Plan and experiencing above-median subsidy growth in the post-shock period compared to the level in the pre-shock period, and zero for the previous five years and for those industries not encouraged in the Plan. In Tables 7 and 11, $Treated$ is defined at the firm level, equal to one for the five years following the release of a Five-Year Plan for U.S. firms operating in a treated industry in a Plan, and zero for the previous five years and for those firms that do not operate in an industry encouraged in the Plan.

$Treated^{\tau}$	In columns (1), (2), (4), and (5) of Table 4, $Treated^{\tau}$ is a dummy variable that equals one for the τ^{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 is experiencing above-median subsidy growth in the post-shock period compared to the level in the pre-shock period and zero for those establishments not in an industry encouraged in the Plan. In columns (6) and (7) of Table 4, $Treated^{\tau}$ is a dummy variable that equals one for the τ^{th} ($-\tau^{th}$) year after (before) the announcement of a Five-Year Plan if a firm is in an industry encouraged in the Plan and is experiencing above-median subsidy growth in the post-shock period compared to the level in the pre-shock period and zero for those firms that do not operate in an industry encouraged in the Plan. In columns (3) and (8) of Table 4, $Treated^{\tau}$ is a dummy variable that equals one for the τ^{th} ($-\tau^{th}$) year after (before) the announcement of a Five-Year Plan if an industry is encouraged in the Plan and is experiencing above-median subsidy growth in the post-shock period compared to the level in the pre-shock period and zero for those industries not encouraged in the Plan.
$SameFirmAsTreated$	A dummy variable that equals one for the five years following the release of a Five-Year Plan if an establishment is in a 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 compared to 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 of 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 intensively to a treated industry of which upstream industries have a weighted average export intensity to China above the median. To define an upstream industry, we use $Upstream\_To\_Treated$, a dummy variable equal to one if an industry supplies inputs intensively to a treated industry. More specifically, 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 all non-treated industries that supply to a treated industry and define those industries in the top tercile as upstream industries (i.e., with $Upstream\_To\_Treated$ equal to one).
$BeneficiaryDownstr_{-1}$	A dummy variable that indicates whether an establishment is in an industry that is downstream of 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 intensively from a treated industry of which downstream industries have a weighted average import intensity from China above the median. To define a downstream industry, we use $Downstream\_To\_Treated$, a dummy variable equal to one if an industry intensively sources inputs from a treated industry. More specifically, 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 all non-treated industries that source from a treated industry and define those industries in the top tercile as downstream industries(i.e., with $Downstream\_To\_Treated$ equal to one).
$NonBeneficiary_{-1}$	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 one if $BeneficiaryDownstr_{-1}$ or $BeneficiaryDownstr_{-1}$ equals one and is 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 the China presence dummy to one if the 10-K of a firm-year includes discussions of a manufacturing facility in China or mentions an operation site/facility in China and to zero if there are no such discussions or mentions.
$BeneficiaryIndExposure_{-1}$	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 years after the enactment of a Five-Year Plan, this 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.
$OpioidUseRate_{US}$	The number of opioid prescriptions per 100 residents in a county during a given year.
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.
$Output_{US}^{Ind}$	The total output of all firms for an 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 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 columns (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
$Output_{US}^{Ind}$	57.2	100.2	9.3	28.9	71.0
$Job\ Postings_{US}$	333.7	699.2	21.0	87.0	270.0
$Export_{US}$	8.85%	5.56%	5.11%	8.21%	11.76%
$Firms_{CN}$	1,503	1,579	536.4	1,173	2,466
$Employment_{CN}$	657,300	693,100	241,500	443,400	805,400
$Export_{CN}$	19.37%	12.01%	9.79%	18.40%	22.55%
Subsidy (nominal)	629.1	801.6	93.9	315.3	633.7
Subsidy (# of firms)	191.8	166.5	68.1	144.4	265.6
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%

Table 3: **The impact of industrial policies in Chinese Five-Year Plans.** This table reports the impact of the 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)	Closure_{US} (3)	$\log(\text{Output}_{US})$ (4)
Treated	-0.051***	-0.061***	0.010***	-0.036***
	(-6.17)	(-5.67)	(7.14)	(-4.35)
Observations	1,245,000	1,245,000	1,245,000	1,245,000
Establishment-Plan FE	Yes	Yes	Yes	Yes
Year-Plan FE	Yes	Yes	Yes	Yes
Observation level	Establishment	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 in columns (1), (2), (4), and (5), firm fixed effects for columns (6) and (7), and industry fixed effects for columns (3) and (8). 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)	Closure_{US} (4)	$\log(\text{Output}_{US})$ (5)	AccumReturn_{US} (6)	Q_{US} (7)	$\log(\text{Job Postings}_{US})$ (8)
Treated^{-3}	-0.009	-0.004	-0.001	-0.001	0.000	-0.027	-0.013	-0.015
	(-0.88)	(-0.37)	(-0.08)	(-0.41)	(0.04)	(-1.00)	(-0.80)	(-0.65)
Treated^{-2}	-0.003	0.002	0.003	0.002	-0.008	-0.022	-0.011	-0.014
	(-0.49)	(0.23)	(0.27)	(0.95)	(-0.73)	(-0.83)	(-0.67)	(-0.63)
Treated^{0}	-0.003	-0.011	-0.010	0.002	-0.008	-0.083**	-0.044**	-0.004
	(-0.56)	(-1.12)	(-0.97)	(0.82)	(-0.91)	(-2.53)	(-2.34)	(-0.17)
Treated^{1}	-0.013**	-0.034***	-0.014	0.003	-0.015*	-0.140***	-0.077***	-0.046**
	(-1.99)	(-2.88)	(-1.19)	(1.57)	(-1.76)	(-4.90)	(-4.52)	(-2.01)
Treated^{2}	-0.048***	-0.069***	-0.042***	0.008***	-0.033**	-0.100***	-0.065***	-0.097***
	(-3.83)	(-4.34)	(-3.29)	(4.14)	(-2.41)	(-3.01)	(-3.35)	(-4.24)
Treated^{3}	-0.081***	-0.091***	-0.058***	0.016***	-0.060***	-0.105***	-0.070***	-0.180***
	(-4.93)	(-4.75)	(-4.10)	(7.35)	(-4.70)	(-3.26)	(-3.53)	(-7.87)
Treated^{4}	-0.100***	-0.082***	-0.066***	0.019***	-0.077***	-0.127***	-0.079***	-0.178***
	(-6.45)	(-4.32)	(-4.21)	(8.29)	(-5.58)	(-3.72)	(-3.94)	(-7.38)
Observations	1,058,000	1,058,000	1,900	1,058,000	1,058,000	49,000	49,000	16,357
Establishment-Plan FE	Yes	Yes		Yes	Yes			
Firm-Plan FE						Yes	Yes	
Industry-Plan FE			Yes					Yes
Year-Plan FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observation level	Establishment	Establishment	Industry	Establishment	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 China's Five-year Plans on the economic activities of U.S. establishments from the upstream or downstream perspective. Columns (1)–(3) present results pertaining to the effects on economic activities in the industries that supply products to a focal industry in a Plan and have a high export intensity to China (the upstream perspective), and columns (4)–(6) report the impact on economic activities in the industries that source inputs from a focal industry in a Plan and have a high import intensity from China (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:	$\log(\text{Employment}_{US})$	$\log(\text{Investment}_{US})$	Closure_{US}	$\log(\text{Employment}_{US})$	$\log(\text{Investment}_{US})$	Closure_{US}
Industry Type:	Upstream	Upstream	Upstream	Downstream	Downstream	Downstream
	(1)	(2)	(3)	(4)	(5)	(6)
UpstreamToTreated*ExportToChina$_{-1}$	0.018***	0.022***	-0.004***			
	(5.89)	(6.19)	(-4.05)			
DownstreamToTreated*ImportFromChina$_{-1}$				0.020***	0.021***	-0.004***
				(6.09)	(5.93)	(-5.27)
Observations	1,051,000	1,051,000	1,051,000	1,051,000	1,051,000	1,051,000
Establishment-Plan FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Plan FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 6: **Within-firm reallocation in response to Five-Year Plans: Upstream/downstream industries.** In this table we report results on how U.S. firms that operate in the industries treated by a Plan reallocate their production activities from the upstream or downstream perspective. Columns (1)–(3) present how affected firms adjust their economic activities in the industries targeted by a Plan, the targeted industries' upstream and downstream sectors, which presumably benefit 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 within-firm reallocation among different types of industries; 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)	Closure_{US} (3)	$\log(\text{Employment}_{US})$ (4)	$\log(\text{Investment}_{US})$ (5)	Closure_{US} (6)
Treated	-0.047***	-0.058***	0.009***			
	(-5.97)	(5.41)	(6.93)			
SameFirmAsTreated*$\text{BeneficiaryUpstr}_{-1}$	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*$\text{BeneficiaryDownstr}_{-1}$	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*$\text{NonBeneficiary}_{-1}$	-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: Offshoring activity.** The table reports the effect on U.S. public firms' intensity of offshoring production to China. Column (1) focuses on a firm-level text-based measure constructed from 10-Ks, and column (2) focuses on foreign firms' (excluding Greater China) presence in China based on the CIED data. We incorporate firm-Plan fixed effects and year-Plan fixed effects for column (1), and industry-Plan fixed effects and year-Plan fixed effects in column (2). 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:	$\log(\text{OffshoreIntensity}_{US})$ (1)	$\text{ForeignFirmPercent}_{CN}$ (2)
Treated	0.051***	0.064**
	(5.65)	(2.15)
Observations	57,500	1,900
Firm-Plan FE	Yes	
Industry-Plan FE		Yes
Year-Plan FE	Yes	Yes
Observation level	Firm	Industry

Table 8: **Within-firm reallocation along supply chains: High versus low adjustment frictions.** This table reports within-firm reallocation across industries in response to Five-Year Plans for affected firms with high or low adjustment friction. Columns (1), (3), and (5) focus on firms with high adjustment friction, while columns (2), (4), and (6) focus on firms with low adjustment friction. In the first part, we present six sets of results based on five financial constraint measures: the HM index, the WW index, leverage, being a private firm (as opposed to a public firm), being a PE-backed private firm (as opposed to other private firms), being a private firm with public debts (as opposed to other private firms). In the second part, we present a set of results based on the level of human capital friction. We measure labor friction by the exposure to right-to-work laws and unions for the states that host a firm's establishments. We measure board/executive human capital frictions using the average tenure of a firm's board and the tenure of a firm's CEO. 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:	$\log(\text{Employment}_{US})$		$\log(\text{Investment}_{US})$		Closure_{US}	
	High Friction	Low Friction	High Friction	Low Friction	High Friction	Low Friction
	(1)	(2)	(3)	(4)	(5)	(6)
A. Financial Frictions:						
HM index:						
SameFirmAsTreated*BeneficiaryUpDown$_{-1}$	-0.006	0.142***	-0.019	0.150***	-0.012	-0.042**
	(-0.08)	(2.84)	(-0.11)	(2.99)	(-0.10)	(-2.05)
WW index:						
SameFirmAsTreated*BeneficiaryUpDown$_{-1}$	0.017	0.139***	0.015	0.140***	-0.009	-0.043**
	(0.39)	(2.75)	(0.35)	(2.77)	(-0.90)	(-2.10)
Leverage:						
SameFirmAsTreated*BeneficiaryUpDown$_{-1}$	-0.028	0.150***	0.014	0.144***	-0.002	-0.044**
	(-0.41)	(2.78)	(0.31)	(2.68)	(-0.23)	(-2.07)
Private versus Public firms:						
SameFirmAsTreated*BeneficiaryUpDown$_{-1}$	0.022***	0.113***	0.033***	0.116***	-0.013**	-0.035**
	(2.88)	(2.98)	(2.85)	(3.25)	(-2.78)	(-2.30)
Non-PE backed versus PE backed private firms:						
SameFirmAsTreated*BeneficiaryUpDown$_{-1}$	0.020***	0.098***	0.030***	0.111***	-0.012**	-0.035**
	(2.74)	(2.88)	(2.69)	(2.22)	(-2.29)	(-2.44)
Private firms without versus with public debt:						
SameFirmAsTreated*BeneficiaryUpDown$_{-1}$	0.021***	0.089***	0.031***	0.126***	-0.011**	-0.057**
	(2.88)	(2.64)	(2.89)	(2.71)	(-2.14)	(-2.18)
B. Human Capital Frictions:						
Low versus high exposure to right-to-work law:						
SameFirmAsTreated*BeneficiaryUpDown$_{-1}$	0.027**	0.080***	0.034**	0.088***	-0.006	-0.028***
	(2.45)	(3.44)	(2.44)	(2.94)	(-1.18)	(-2.36)
High versus low unionization:						
SameFirmAsTreated*BeneficiaryUpDown$_{-1}$	0.031***	0.054***	0.044***	0.071***	-0.003	-0.031***
	(3.78)	(6.30)	(4.56)	(7.42)	(-0.24)	(-2.87)
High versus low board tenure:						
SameFirmAsTreated*BeneficiaryUpDown$_{-1}$	0.048**	0.178***	0.068**	0.164***	-0.011*	-0.060**
	(2.40)	(3.76)	(2.10)	(3.34)	(-1.68)	(-2.27)
High versus low CEO tenure:						
SameFirmAsTreated*BeneficiaryUpDown$_{-1}$	0.066***	0.157***	0.065**	0.172***	-0.014*	-0.057**
	(2.62)	(3.44)	(2.30)	(3.10)	(-1.81)	(-2.15)
Establishment-Plan FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year-Plan FE	Yes	Yes	Yes	Yes	Yes	Yes
Observation level	Establishment	Establishment	Establishment	Establishment	Establishment	Establishment

Table 9: **With-firm adjustment in the form of offshoring: High versus low adjustment frictions.** The table examines within-firm adjustment through offshoring to China in response to Five-Year Plans for affected firms with varying levels of adjustment frictions. Columns (1)–(3) focus on a firm-level textual measure based on 10-Ks, and columns (4)–(6) focus on foreign firms' (excluding Greater China) presence in China based on the CIED data. Columns (1) and (4) show the heterogeneous effects across levels of financial constraints based on the HM textual measure; columns (2) and (5) show heterogeneous effects across the levels of exposure to right-to-work laws in the hosting states of a firm's establishments; columns (3) and (6) show the heterogeneous effects across average board tenures. We incorporate firm-Plan (industry-Plan) fixed effects and year-Plan fixed effects for columns (1)–(3) (columns (4)–(6)). 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:	$\log(\text{OffshoreIntensity}_{US})$			$\text{ForeignFirmPercent}_{CN}$		
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	-0.015	0.065***	0.044***	0.020	0.105***	0.045*
	(-1.49)	(6.52)	(5.90)	(0.88)	(3.37)	(1.75)
Treated*LowConstraint$_{-1}$	0.082***			0.054***		
	(4.16)			(2.69)		
Treated*HighRTW$_{-1}$		-0.030***			-0.074***	
		(-3.47)			(-2.91)	
Treated*LowBoardTenure$_{-1}$			0.018**			0.044*
			(2.41)			(1.76)
Observations	57,500	57,500	57,500	1,900	1,900	1,900
Firm-Plan FE	Yes	Yes	Yes			
Industry-Plan FE				Yes	Yes	Yes
Year-Plan FE	Yes	Yes	Yes	Yes	Yes	Yes
Observation level	Firm	Firm	Firm	Industry	Industry	Industry

Table 10: **Effects on firms' real outcomes.** The table reports how the effects of Five-Year Plans on the real outcomes of U.S. firms (in their U.S. operation) vary across different types of firms. Panel A focuses on a set of internal conditions of U.S. firms. Columns (1)–(3) show the differential effects on U.S. public firms with versus without a business presence in China before a Plan. Columns (4)–(6) report how the effect varies with a firm's exposure to the beneficiary industries. Columns (7)–(9) report how the effect varies with the average tenure of a firm's board. Panel B focuses on a set of financial and labor market frictions faced by U.S. firms. Columns (1)–(3) report the heterogeneous effects across firms with different levels of financial constraint, measured by the HM index. Columns (4)–(6) ((7)–(9)) report how the effect varies with the unionization levels (exposure to right-to-work laws) in the hosting states of a firm's establishments. 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.

Panel A. Firms' Sectoral, Geographic, and Board-Wise Conditions

Dependent variable:	log(Employment$_{US}$) (1)	log(Investment$_{US}$) (2)	log(Establishments$_{US}$) (3)	log(Employment$_{US}$) (4)	log(Investment$_{US}$) (5)	log(Establishments$_{US}$) (6)	log(Employment$_{US}$) (7)	log(Investment$_{US}$) (8)	log(Establishments$_{US}$) (9)
Treated	-0.029**	-0.035***	-0.011***	-0.067***	-0.081***	-0.023***	-0.041***	-0.051***	-0.015***
	(-2.50)	(-2.57)	(-2.65)	(-7.94)	(-9.53)	(-9.85)	(-4.72)	(-4.28)	(-6.07)
Treated*ChinaPresence$_{-1}$	-0.020*	-0.023***	-0.009***						
	(-1.94)	(-3.21)	(-3.01)						
Treated*BeneficiaryIndExposure$_{-1}$				0.056***	0.072***	0.018***			
				(4.66)	(7.32)	(9.82)			
Treated*LowBoardTenure$_{-1}$							0.016**	0.018**	0.004*
							(2.52)	(2.04)	(1.79)
Observations	57,500	57,500	57,500	665,000	665,000	665,000	57,500	57,500	57,500
Firm-Plan FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Plan FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observation level	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm

Panel B. Financial and Labor Market Frictions

Dependent variable:	log(Employment$_{US}$) (1)	log(Investment$_{US}$) (2)	log(Establishments$_{US}$) (3)	log(Employment$_{US}$) (4)	log(Investment$_{US}$) (5)	log(Establishments$_{US}$) (6)	log(Employment$_{US}$) (7)	log(Investment$_{US}$) (8)	log(Establishments$_{US}$) (9)
Treated	-0.081***	-0.132***	-0.042***	-0.088***	-0.080***	-0.031***	-0.086***	-0.101***	-0.029***
	(-5.21)	(-6.46)	(-10.48)	(-5.23)	(-5.56)	(-8.27)	(-4.55)	(-7.39)	(-7.22)
Treated*LowConstraint$_{-1}$	0.060***	0.113***	0.036***						
	(4.27)	(5.36)	(9.23)						
Treated*LowUnionization$_{-1}$				0.061***	0.014**	0.020***			
				(3.30)	(2.04)	(6.02)			
Treated*RTW$_{-1}$							0.053**	0.056***	0.017***
							(2.11)	(3.35)	(3.35)
Observations	57,500	57,500	57,500	665,000	665,000	665,000	665,000	665,000	665,000
Firm-Plan FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Plan FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observation level	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm	Firm

Table 11: **Effects on stock market valuation.** The table reports how the effects of Five-Year Plans on the stock market valuation of U.S. public firms vary across different types of firms. Panel A focuses on a set of internal conditions of U.S. firms. Columns (1)–(3) show the differential effects on U.S. public firms with versus without a business presence in China before a Plan. Columns (4)–(6) report how the effect varies with a firm's exposure to the beneficiary industries. Columns (7)–(9) report how the effect varies with the average tenure of a firm's board. Panel B focuses on a set of financial and labor market frictions faced by U.S. firms. Columns (1)–(3) report the heterogeneous effects across firms with different levels of financial constraint, measured by the HM index. Columns (4)–(6) ((7)–(9)) report how the effect varies with the unionization levels (exposure to right-to-work laws) in the hosting states of a firm's establishments. 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.

Panel A. Firms' Sectoral, Geographic, and Board-Wise Conditions

Dependent variable:	Q_{US} (1)	$AccumReturn_{US}$ (2)	Q_{US} (3)	$AccumReturn_{US}$ (4)	Q_{US} (5)	$AccumReturn_{US}$ (6)
Treated	-0.064***	-0.095***	-0.069***	-0.106***	-0.064***	-0.094***
	(-4.03)	(-3.49)	(-3.83)	(-4.07)	(-3.75)	(-4.10)
Treated*ChinaPresence$_{-1}$	0.048***	0.044*				
	(3.28)	(1.86)				
Treated*BeneficiaryIndExposure$_{-1}$			0.058***	0.087**		
			(4.73)	(2.45)		
Treated*LowBoardTenure$_{-1}$					0.023**	0.024*
					(2.17)	(1.70)
Observations	57,500	57,500	57,500	57,500	57,500	57,500
Firm-Plan FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Plan FE	Yes	Yes	Yes	Yes	Yes	Yes
Observation level	Firm	Firm	Firm	Firm	Firm	Firm

Panel B. Financial and Labor Market Frictions

Dependent variable:	Q_{US} (1)	$AccumReturn_{US}$ (2)	Q_{US} (3)	$AccumReturn_{US}$ (4)	Q_{US} (5)	$AccumReturn_{US}$ (6)
Treated	-0.145***	-0.240***	-0.068***	-0.090***	-0.071***	-0.086***
	(-4.58)	(-7.10)	(-3.32)	(-2.51)	(-3.87)	(-2.76)
Treated*LowConstraint$_{-1}$	0.116***	0.192***				
	(3.06)	(6.53)				
Treated*LowUnionization$_{-1}$			0.033***	0.016		
			(2.89)	(0.90)		
Treated*RTW$_{-1}$					0.039***	0.003
					(2.62)	(0.17)
Observations	57,500	57,500	57,500	57,500	57,500	57,500
Firm-Plan FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Plan FE	Yes	Yes	Yes	Yes	Yes	Yes
Observation level	Firm	Firm	Firm	Firm	Firm	Firm

Internet Appendix for the paper

"How Do Firms Withstand A Global Economic Shock: Evidence From Within-Firm Responses"

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Wei Jiang, Emory University

Appendix A. Addressing the 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 have a missing indices problem in certain years. This issue is relevant to one variable in our tests: subsidies, which are missing for 2008 through 2010. Subsidy measures are used in Tables 3 to **??** and Table IA1. To ensure that the estimates reported in Table IA1 are not affected by the missing data 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 of 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% extreme on one end for the variables that are unbounded on only one side. The results of these 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 error, 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)
$log(Output^{Ind}_{US,t-1})$	-0.002	0.073		0.045	0.039	
	(-0.03)	(0.57)		(0.82)	(0.57)	
$log(Output^{Ind}_{US,t-2})$	0.083		0.064	0.006		0.044
	(0.70)		(0.54)	(0.13)		(0.81)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table A2: **The impact of China's 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 and 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)
Observations	1,900
Year-Plan FE	Yes
Industry-Plan FE	Yes

Table A3: **Within-firm reallocation along supply chains: High versus low financial frictions.** This table reports within-firm reallocation across industries in response to Five-Year Plans for affected firms with high or low financial frictions. Columns (1), (3), and (5) focus on firms with high financial friction, while columns (2), (4), and (6) focus on firms with low adjustment friction. Complementing Table 8, we present additional results based on two financial constraint measures of U.S. public firms: the SA (i.e., size-age) measure and the KZ index. We incorporate establishment-Plan fixed effects and firm-year-Plan fixed effects in all analyses. All variables are defined in Table 1 and section 4.3. 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:	$\log(\text{Employment}_{US})$		$\log(\text{Investment}_{US})$		Closure_{US}	
	High Friction	Low Friction	High Friction	Low Friction	High Friction	Low Friction
	(1)	(2)	(3)	(4)	(5)	(6)
SA index:						
SameFirmAsTreated*BeneficiaryUpDown$_{-1}$	-0.019	0.143***	-0.016	0.148***	0.007	-0.046**
	(-0.14)	(2.63)	(-0.21)	(2.97)	(0.25)	(-2.13)
KZ index:						
SameFirmAsTreated*BeneficiaryUpDown$_{-1}$	-0.021	0.152***	0.019	0.138***	-0.002	-0.044**
	(-0.63)	(2.59)	(0.42)	(2.74)	(-0.13)	(-2.15)
Establishment-Plan FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year-Plan FE	Yes	Yes	Yes	Yes	Yes	Yes
Observation level	Establishment	Establishment	Establishment	Establishment	Establishment	Establishment

Table A4: **With-firm adjustment in the form of offshoring: High versus low labor frictions.** The table examines within-firm adjustment through offshoring to China in response to Five-Year Plans for affected firms with varying levels of labor friction. Column (1) shows the heterogeneous effects across unionization rates of the states that host a firm's establishment. We incorporate firm-Plan fixed effects and year-Plan fixed effects for the analysis. 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:	$\log(\text{OffshoreIntensity}_{US})$
	(1)
Treated	0.092***
	(9.28)
Treated*LowUnionization$_{-1}$	-0.077***
	(-7.31)
Observations	57,500
Firm-Plan FE	Yes
Year-Plan FE	Yes
Observation level	Firm