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ORIGINAL ARTICLE

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U.S.–China trade war and corporate reallocation: Evidence from Chinese listed companies

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Abstract

This paper applies a difference-in-differences framework to explore the economic consequences of the recent U.S.–China trade war. The average abnormal returns of Chinese listed firms during a period centered on President Trump's announcement on 22 March 2018 are taken as a proxy for the firms' exposure to the potential trade war. Firms more negatively exposed are found, surprisingly, to report higher total revenues in the post-announcement period. The results indicate that the Chinese firms tend to reallocate their business from overseas to the domestic market. Such within-firm reallocation is found to be more pronounced among private firms, exporting firms and non-FDI firms. Besides, firms with higher negative exposure increase total investment and financing but decrease foreign investment after the trade war.

KEYWORDS

abnormal returns, China, overseas revenue, reallocation, trade wars

1 | INTRODUCTION

On 22 March 2018, America's President Trump signed a presidential memorandum imposing import tariffs on over $50 billion of Chinese products. That represents the beginning of a U.S.–China trade war. This unexpected announcement leads to a sharp increase in economic

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uncertainty (Fatma & Bharti, 2019),[1] which inevitably affects firms (e.g., Crowley et al., 2018; Handley & Limão, 2015; Schott et al., 2017). Whether such policy uncertainty disincentivises overseas activities and will induce firms to move back home remains to be seen. Previous studies have illustrated that changes in trade policy can result in both inter-industry and intra-industry reallocation of market share (e.g., Bernard et al., 2006; Feng et al., 2017; Melitz, 2003). But due to a lack of up-to-date microscale data, few studies have analysed the possibility of a reallocation effect within an individual firm driven by policy uncertainty. This study is designed to do so.

The study first quantifies the sensitivity of an individual firm to the U.S.–China trade war using an event study approach and calculating cumulative abnormal returns (CARs) as a proxy. That method assumes that financial markets are rational and efficient and thus accurately reflect firm value (Greenland et al., 2020). The 22 March 2018 is taken as the announcement date and a 3-day event window is used taking in one trading day proceeding and 1 day following the announcement date. Individual stock returns and market returns for Chinese firms are extracted from the China Stock Market & Accounting Research database (CSMAR). It is found that Chinese listed firms on average record 0.1% lower CARs after the policy shock. Then our main independent variable, *Exposure*, is constructed to reflect the extent to which each firm is negatively exposed to the trade war announcement.

Revenue is adopted as a proxy for a firm's overall performance and overseas revenue is separated from total revenue to capture the effects on foreign business. To systematically analyse the trade war's relative explanatory power with respect to firm revenue, we employ a general difference-in-differences (DID) specification. The results indicate that firms more exposed to the trade war tend to enjoy significantly higher total revenue after the trade war, but their overseas revenue and the overseas share are significantly lower in the post-trade-war period. Ceteris paribus, a one-standard-deviation increase in trade-war exposure is found to be associated with a 2.57% higher total revenue in the post-shock period, but with a 14.43% shrinking of overseas revenue and a 9.57% lower overseas revenue's share of total revenue after the trade war. These results indicate that firms that suffer more from the trade war tend to enlarge their total revenue, but their overseas business shrink, suggesting within-firm reallocation as one of the trade war's effects. These findings are confirmed in a variety of robustness checks, including using alternative measures of trade-war exposure and alternative model specifications.

Then, China's special institutional background is taken into consideration. The business activities of Chinese state-owned enterprises (SOEs) generally have ulterior political purposes like securing resources for the nation. Their top managers normally are politically appointed, and their personal goals may not be purely market-oriented (Amighini et al., 2013; Song et al., 2011; Whalley & Zhang, 2006). Moreover, SOEs receive government support in their daily business and have fewer capital restrictions than normal firms (Buckley et al., 2007; Chan et al., 2012; Ding et al., 2018; Faccio et al., 2006; Feenstra et al., 2014). Facing the U.S.–China trade war, SOEs can expect assistance from the government aimed at mitigating the trade war's negative effects, so the overseas activities of private firms are relatively more vulnerable. Our empirical analysis shows significant reallocation effects among private firms with more negative exposure to the trade war, but not for SOEs.

Some heterogeneous effects of firm foreign exposure are also presented as measured by export and foreign direct investment (FDI). Under trade protection barriers, exporting firms are directly

[1] Figure A1 in the Appendix plots the trade policy uncertainty (TPU) of China and the U.S. based on the index from Baker et al. (2016). It shows a remarkable increase in March 2018. Data can be downloaded from: http://www.policyuncertainty.com.

damaged because of higher transaction costs (Huang et al., 2019; Lu et al., 2013), while FDI could provide tariff jumping for multinational firms (Blonigen, 2002; Cole & Davies, 2011; Ekholm et al., 2007). It is found that firms exporting to the United States with higher trade-war exposure tend to reallocate business from overseas to domestic in the post-war period, as compared with their counterparts. Furthermore, the within-firm reallocation is significant for non-FDI firms, implying that FDI can protect firms from losing overseas markets by local production and sales.

Finally, we also explore the trade war's effects on other firm outcomes, including investment and financing activities. While revenue represents a firm's realised performance, investment and financing reflect expectations of its future development. Firms adversely sensitive to the trade war are found to increase their total investment and reduce foreign investment, indicating that within-firm reallocation also exists in firm investment. In terms of financing, firms with higher exposure to the trade war tend to raise more debt and capital, as well as receive more government subsidies after the trade war. This is because firms require more capital to cover the underlying costs of reallocating business towards the domestic market.

These findings add some insights into the reallocation effects of trade policies. Using an international trade model with heterogeneous firms, Melitz (2003) explained how trade exposure leads to intra-industry reallocation. And certainly, many studies have confirmed that trade liberalisation results in resources being reallocated to more productive firms (Bernard et al., 2003; Blyde & Iberti, 2012; Breinlich & Cuñat, 2016; Melitz & Ottaviano, 2008). Some other studies have extended theories about the reallocation effects of productivity to other factors. For example, Bernard et al. (2006) showed that the activities of U.S. manufacturing firms exposed to imports from low-wage countries tend to be reallocated towards capital-intensive plants. Using more disaggregated export data, Feng et al. (2017) shed light on the reallocation after China's WTO accession, particularly by firms with higher prices and lower quality products. However, fewer studies have dealt with reallocation effects within an individual firm or under a trade war context. A recent study by Fajgelbaum et al. (2021) explores the reallocation effects trigged by the tariff policy of the U.S.–China trade on global exports. Our study focuses specifically on the reallocation of a firm's business activities between overseas and domestic markets in response to the outbreak of this trade war.

A growing number of studies have been making predictions about the macro-level outcomes of the U.S.–China trade war. From the U.S. aspect, Amiti et al. (2019), Cavallo et al. (2021) and Fajgelbaum et al. (2020) find that there has been an almost complete pass-through of tariffs on U.S. prices. With a standard quantitative trade model, Amiti et al. (2019) further find that an observed increase in imported Chinese products is associated with a $1.4 billion reduction in U.S. real monthly income by the end of 2018. In research focusing on China, Qiu et al. (2019) analysed the trade war's effects on Chinese share and foreign exchange markets. They found dramatic declines in both market indices and the value of the yuan after the outbreak of the trade war. Using a scenario analysis, Chong and Li (2019) predicted that in the worst case there will be a 1.1% decrease in employment and a 1% decline in China's GDP as a result of the trade war. The simulation results of Xia et al. (2019) reveal that the energy sector of both China and the United States suffer from the recent trade war. However, firm-level responses to the trade war were not studied. The most related paper by Huang et al. (2019) finds that the overall market reactions of U.S. firms to the trade war are negative and that firms in a trade network with China suffer the most. Egger and Zhu (2020) extend the analysis to the global stock market and find heterogeneous effects in the United States, China and third countries. Rather than examining stock returns during the trade war, our study provides a more comprehensive analysis of the effects of the trade war on Chinese firms' performance, linking the trade war with the real economy at the firm level.

The paper proceeds as follows. Section 2 provides a brief overview of this U.S. –China trade war. Section 3 describes sample coverage and variable measurements in this study. Section 4 presents and discusses the empirical results. The final section draws the conclusion.

2 | OVERVIEW OF THE TRADE WAR

As early as 18 August 2017, the U.S. government approved the Office of the United States Trade Representative (USTR) to initiate an investigation based on Section 301 of the Trade Act of 1974 into China. On 22 March 2018, the Trump administration issued a presidential memorandum in reference to this investigation, proposing to impose tariffs on about $50 billion Chinese imports as a response to China's unfair business and trade practices, especially the theft of U.S. intellectual property. The Chinese government then hit back with a list of 128 products from the United States that would face additional tariffs. On 3 April 2018, the USTR published the first product list, covering 1300 Chinese products with $50 billion. On 6 July 2018, the first batch of $34 billion products imposed by the United States took effect, and the rest of $16 billion came into effect on 8 August 2018. On 18 September 2019, the USTR announced a list of tariffs on $200 billion of Chinese products. To retaliate, China imposed additional tariffs on $60 billion in imports from the United States. In December 2018, a trade negotiation between the United States and China was held. The United States decreased its tariff level and China agreed to increase imports from the United States. However, the U.S. government again imposed tariffs on $200 billion of Chinese products from 10% to 20% on 5 May 2019, which led to an escalation of the trade war. The U.S.–China trade war has been lasting for 2 years. In January 2020, the United States and China officials signed the *Economic and Trade Agreement between China and the U.S.* at the White House, indicating a periodical cease of the trade war.[2]

The United States and China are the two largest economies in the world. The current trade war has been the largest trade conflict around the world in the past half-century (Qiu et al., 2019). Fragmentation of cross-border production has linked most countries to the global supply chains in recent decades. This trade war would have large impact on or even change the structure of the world economy. The reasons for and potential implications of the trade war are of great significance.

China's open market economic reforms in 1978 and WTO accession in 2001 enable China to achieve impressive economic growth during the past decades. In 2010, China surpassed Japan to become the world's second-largest economy, and in 2013, China surpassed the United States as the largest trading economy in the world (Huang et al., 2019). China–U.S. relationship has also become closer. China is now the United States largest trading partner and third-largest export market. The U.S. bilateral trade deficit with China arose in the early 1980s and reached 46.7% of the overall U.S. trade deficit in 2018 (Sukar & Ahmed, 2019). The widening trade imbalance is the main reason behind the rising tensions between the United States and China (e.g., Fatma & Bharti, 2019; Huang et al., 2019; Sukar & Ahmed, 2019). As studied in the literature, the fierce import competition and trade deficit from China squeezed out employment in U.S. manufacturing (e.g., Autor et al., 2013, 2016, 2021; Scott, 2017).[3] During the 45th presidential campaign, Trump made economic promises

[2]The timeline and key events of the U.S.-China trade war are shown in Appendix B.

[3]Sukar and Ahmed (2019) proposed that the trade imbalance is misleading because multinational firms relocate their production and marketing operations to countries with lower costs, but the common calculation does not exclude the value generated by the U.S. firms in China. Wang et al. (2018) found that when taking supply chains into consideration, imported inputs from China boost local employment and real wages for U.S. manufacturing sector.

to bring back manufacturing from overseas, especially from China. He alleged that the undervalued Chinese currency and unfair actions by the Chinese government (such as subsidies to Chinese firms) are the key-driven factors for the trade deficit. To realise his promise, the Trump administration decided to launch a trade dispute with China.

Another concern by the U.S. government is that China has been using illegal and unfair ways to acquire American technology (Huang et al., 2019). They alleged that China imposed pressure on the U.S. firms' technology transfer by restrictions on foreign ownership, at the same time, the Chinese government offers beneficial to Chinese firms' investment (especially to state-owned companies) in the acquisition of U.S. firms to obtain cutting-edge technology (Qiu et al., 2019). On the other hand, the United States considers that Chinese high-tech firms in the U.S. market are a threat to its national security (Sukar & Ahmed, 2019). In line with this concern, the USTR imposed tariffs on products mentioned in the "Made in China 2025" initiative and restricted U.S. exports to Chinese high-tech firms, such as ZTE Corporation and Huawei Technologies Company.

3 | EMPIRICAL STRATEGY

3.1 | Data source and sample coverage

The study's main data source is the CSMAR database. It provides stock information about all publicly listed Chinese companies as well as their financial statements. All Chinese firms with A-shares traded on the Shanghai and/or Shenzhen stock exchanges and growth enterprise market (GEM) are included except for financial firms, special-treated firms and firms with missing values.[4] The sample comprises 12,878 firm-year observations, covering 2796 unique firms from 2015 to 2019.

3.2 | Variable construction

3.2.1 | Firm exposure to the trade war

To assess the overall economic consequences of the U.S. –China trade war at the firm level, an event study approach and CARs are used to quantify each firm's sensitivity to changes in trade policy (e.g., Amiti et al., 2020; Greenland et al., 2020; Huang et al., 2019). This approach assumes that the market efficiently reflects a firm's value in its stock price and that CARs measure traders' overall assessment of an event's impacts on firm value (Greenland et al., 2020). Announcements signalling a trade war can change investors' expectations about some firms' future net cash flows, which leads to the revaluation of the company. Predicting normal returns within the event window under the assumption that the special event does not happen then allows quantifying the difference between the realised returns and normal returns, termed abnormal returns, which indicates the net impacts of the policy changes. In the context of the U.S.–China trade war, the calculation is related to the announcement on 22 March 2018 when Trump signed a memorandum to impose tariffs on Chinese products, which is usually treated as the starting point of this

[4]Under the regulation of the China Securities Regulatory Commission (CSRC), firms with unusual financial conditions or other abnormal situations will be named as "special treatment," which is labelled as ST or *ST.

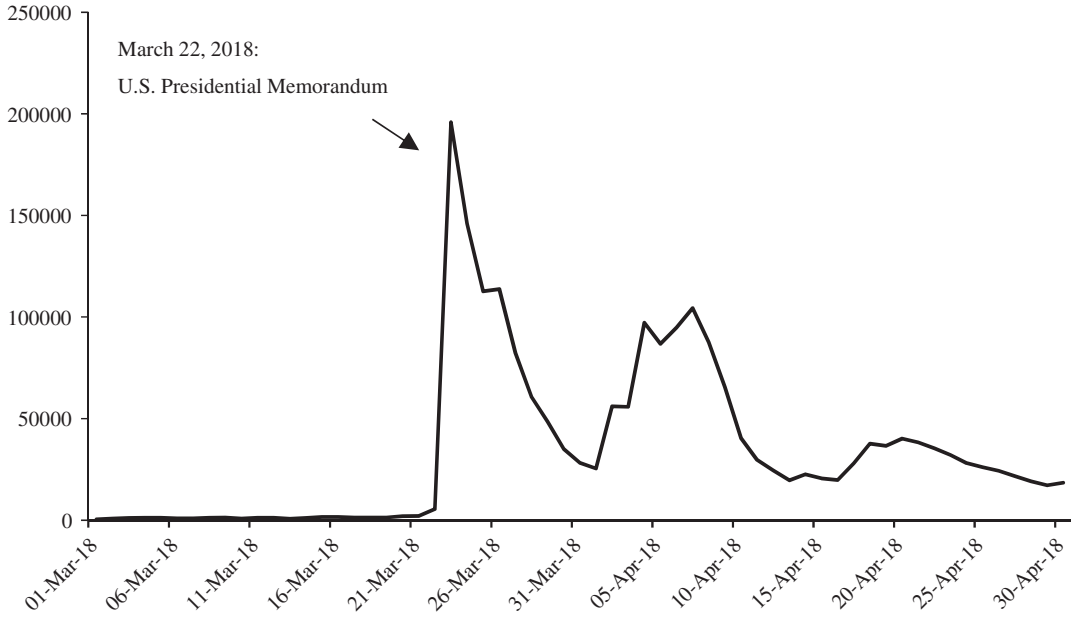

FIGURE 1 Search frequency on "U.S.–China trade war"

trade war because it was unexpected and triggered other critical events in 2018 and 2019 (Egger & Zhu, 2020; Huang et al., 2019).[5]

To exclude any potential influence of subsequent policy changes, the event window used is 22 March and one trading day proceeding and following, so 21 March, 22 March and 23 March 2018. That 3-day event window is considered wide enough to reflect the announcement's impact while avoiding the effects of confounding events (Huang et al., 2019). The Baidu Index of online searches for "U.S.-China trade war" (in Chinese) during March and April 2018 is plotted in Figure 1.[6] The sharp jump on 22 March indicates that the U.S. announcement about its China tariff policy is an unexpected event for investors.

The announcement's impact on a firm's stock return is isolated by measuring the difference between actual price movements and those predicted by a firm's trading history. This measure captures real-time stock price shifts over the event window. The market model used to compute abnormal returns for each security is

$$AR_{it} = R_{it} - \widehat{\alpha}_i - \widehat{\beta}_i * R_{mt}, \tag{1}$$

whereR_{it} represents the observed return for firm i at date t that is calculated as the changes in shares prices after dividends. R_{mt} is the value-weighted market returns at date t. An individual $\widehat{\beta}_i$ is computed for each firm by running a separate regression of its stock return against changes in the market

[5]Different from the existing studies that have explored the effects of the U.S.-China trade war by the certain tariff measures (e.g., Amiti et al., 2019; Fajgelbaum et al., 2020, 2021), our paper highlights the trade policy uncertainty arising from the abrupt outbreak of the trade war. Stock market reaction to the trade-war announcement reflects the expected valuation of an induvial firm in the future, thus CARs is a proper measure in our context of uncertainty.

[6]Ji and Wei (2014) have shown that the frequency of Google searches is a direct measure of investor attention. The Baidu Index is used here since Baidu is China's most used search engine.

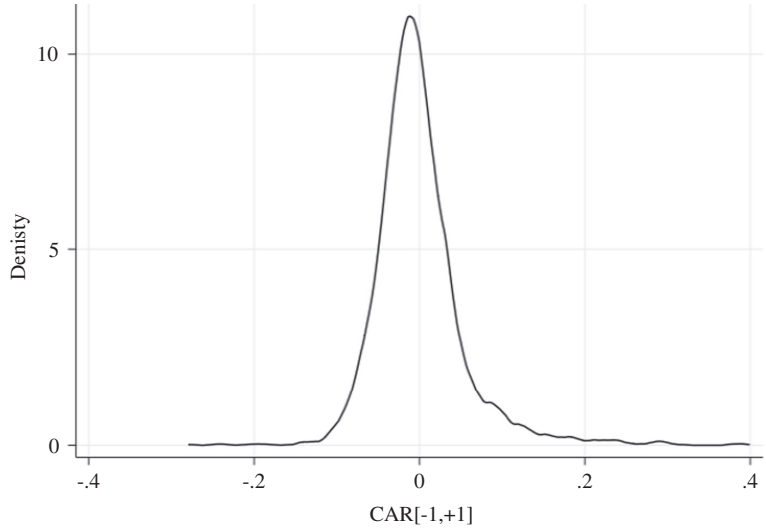

FIGURE 2 Distribution of CAR [−1, +1]

average over a 180-day estimation window from 190 to 11 days before the announcement. In this procedure, ST firms are excluded along with any which does not have enough records within the 180-day period.

The CARs over the 3-day event window for firm i are then calculated as

$$CAR_i[-1,+1] = \sum_{-1}^{+1} AR_{it}. \tag{2}$$

This procedure yields a total of 2796 observations. Figure 2 shows the distribution of the CARs to be leptokurtic with a fatter tail and right skewed. Considering that the topic of interest is firms that suffered from the announcement, a new variable $Exposure_i$ is defined for interpretative convenience. It is defined as −1 times the original $CAR_i[-1,+1]$. A larger value of $Exposure_i$ means a more negative stock market reaction to the trade war.

As reported in Table 1, the average value of $Exposure_i$ indicates that Chinese firms have on average 0.1% lower 3-day CARs centered on the announcement date; 1613 of the 2796 firms experience a decline in their stock returns (57.69%), indicating that overall, the market treats the outbreak of the trade war as negative news.

3.2.2 | Other variables

Firm revenue data are also collected from the CSMAR database. The variable $Total\ revenue_{it}$ is defined as the logarithm of annual total revenue gained by firm i at year t. Similarly, the variable $Overseas\ revenue_{it}$ represents the logarithm of firm i's overseas revenue at year t. To distinguish any effects of the trade war on overseas and domestic activities, overseas revenue is expressed as a proportion of total revenue and labelled as $Overseas\ share_{it}$.[7] The average amount of total reve-

[7]Within the total sample of 2796 firms, 836 firms having overseas business during the whole period. Fewer firms obtaining overseas revenue after the outbreak of the trade war in 2018 (751 vs 714).

TABLE 1 Summary statistics

Variables	Mean	Min	Median	Max	SD
Core variables					
Exposure	0.001	−0.399	0.008	0.280	0.054
Exposure (2 day)	0.002	−0.287	0.008	0.185	0.045
Exposure (HS300)	0.026	−0.349	0.032	0.288	0.055
Exposure (exchange)	0.003	−0.390	0.010	0.294	0.055
Exposure (3 factor)	−0.096	−0.491	−0.089	0.176	0.054
Total revenue	21.590	15.510	21.450	28.720	1.501
Overseas revenue	4.450	0	0	28.460	8.261
Overseas share	4.770	0	0	99.970	14.070
Other variables					
Investment	18.590	7.346	18.640	26.510	1.875
Foreign investment	2.752	0	0	25.650	6.263
Foreign investment share	2.996	0	0	99.730	11.900
Total debt	21.350	16.020	21.230	28.060	1.694
Paid-in capital	20.250	17.490	20.210	25.930	1.063
Subsidy	17.200	3.229	17.230	23.920	1.686
Control variables					
ROA	0.040	−0.646	0.039	0.482	0.061
Liquidity	0.164	−0.697	0.144	0.892	0.160
Size	22.060	18.370	21.890	28.500	1.309
Leverage	0.407	0.020	0.387	1.352	0.209

Note: All variables are reported in raw data.

nue in the sample is ¥2.38 billion; overseas revenue and the share among those firms with foreign business are ¥0.30 billion and 20.91% on average, respectively.

For firm-level control variables, firm size (logarithm of total assets), leverage (total liabilities/total assets), liquidity (cash and cash equivalents + short-term investments + receivables/total asset) and return-on-assets (ROA) are included as a proxy for a firm's investment opportunities and ability to finance future development, and thus affect a firm's sales (e.g., Aivazian et al., 2005; Greenland et al., 2020; McConnell & Servaes, 1995). To avoid the time-trend correlation between dependent variables and controls, we keep the initial value of firm controls in the beginning year of our sample period (e.g., 2015).[8] Summary statistics describing all the variables are presented in Table 1 and the variable definitions are summarised in Table A1 of the Appendix A.

3.3 | Baseline specification

To explore the economic consequences and the reallocation effects, the following model is performed:

[8]For firms that are publicly listed after 2015, we use their attributes upon the entry year.

TABLE 2 Trade war and firm revenues

	(1)	(2)	(3)	(4)	(5)	(6)
	Total revenue		**Overseas revenue**		**Overseas share**	
Post * exposure	0.0314***	0.0257**	−0.1415**	−0.1443**	−0.0943***	−0.0957***
	(0.010)	(0.010)	(0.059)	(0.062)	(0.029)	(0.028)
Post * ROA		0.0017		0.0775*		0.0418
		(0.008)		(0.041)		(0.046)
Post * liquidity		0.0149		0.0192		0.0051
		(0.013)		(0.084)		(0.028)
Post * size		−0.0633***		−0.0655		−0.0340
		(0.008)		(0.088)		(0.035)
Post * leverage		−0.0217		0.0669		0.0312
		(0.013)		(0.110)		(0.029)
Constant	21.5534***	21.5518***	4.2983***	4.2965***	2.1970***	2.1961***
	(0.002)	(0.002)	(0.009)	(0.010)	(0.005)	(0.006)
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.954	0.955	0.857	0.857	0.856	0.856
Observations	12,878	12,878	12,878	12,878	12,878	12,878

Note: All non-bivariate variables are winsorised at the 10% level and all independent variables are normalised. Robust standard errors reported in parentheses are clustered at the CSRC 1-digit sector level. ***$p < .01$, **$p < .05$, *$p < .1$.

$$Outcome_{it} = \alpha + \beta Post \times Exposure_i + \gamma Post * X_i + \delta_i + \delta_t + \epsilon_{it}, \quad (3)$$

where $Outcome_{it}$ is a vector of firm i's $Total\ revenue_{it}$, $Overseas\ revenue_{it}$ and $Overseas\ share_{it}$. *Post* is an indicator equal to one in and after 2018 and otherwise zero. As there are 5 years within the sample period, from 2015 to 2019, *Post* is zero for the first three periods and one for the rest. $Exposure_i$ represents the stock market's reaction in terms of firm i's 3-day CARs.

The first term on the right-hand side is the difference-in-differences term of interest—an interaction of a firm's CARs with the indicator variable (*Post*) for years in and after 2018. So β in Equation (3) captures the relative change in outcomes among firms with differential exposure to the changes imposed by the trade war. X_i contains a series of initial firm attributes which would be expected to affect firm revenue, also interacted with *Post*. The attributes are liquidity, leverage, ROA and size as mentioned above. Firm fixed effects δ_i and year fixed effects δ_t are also included. All the right-hand side variables are normalised, and non-bivariate variables are winsorised at the 10% level.[9] The standard errors are clustered at the sector level.[10]

4 | EMPIRICAL RESULTS

4.1 | Baseline results

Table 2 shows the baseline results using Equation (3). The first two columns use $Total\ revenue_{it}$ as the dependent variable. Column (1) does not contain the control variables while Column (2) uses the full set. The coefficient β of the interaction term in both columns is positive and significant, which indicates that firms with more negative exposure to the trade war have relatively higher total revenues compared with their counterparts after the trade-war announcement. Ceteris paribus, a one-standard-deviation increase in exposure is associated with a 2.57% larger total revenue in the post period. The next two columns examine the effects on overseas revenue, and both show significantly negative coefficients for the interaction term. Firms experiencing more negative stock market reactions to the announcement shrink their overseas business more substantially. Columns (5) and (6) change the dependent variable to $Overseas\ share_{it}$ to capture any reallocation between overseas and domestic business. The significant negative coefficients in both columns imply that firms with more negative exposure to the trade war decrease the share of foreign sales in their total sales, reallocating sales to domestic customers. At the margin, a one-standard-deviation increase in exposure predicts a 14.43% decrease in overseas revenue and a 9.57% decrease in the overseas share after the announcement.[11]

The empirical results show that firms exposed to the trade war apparently benefit overall, but some of their foreign business is reallocated to the domestic market. Firms with negative stock

[9]Our results are unchanged when variables are winsorized at the 5% or 1% level. These results are not reported to save space, but available upon request.

[10]The sector is defined as the 1-digit code based on *Guidelines on Industry Classification of Listed Companies 2012* by the CSRC.

[11]In unreported tables, the parallel assumption is tested. It shows no pre-trends of our main firm outcomes. These results are available upon request.

return responses to the announcement probably have more foreign business with the United States (e.g., Huang et al., 2019).[12] According to international trade theory, only the most productive firms can succeed in foreign markets (e.g., Helpman et al., 2004). These firms must have good fundamentals and be able to adjust their business when necessary. That would help them achieve higher total revenues as observed here.[13] The trade policy uncertainty at the time of a trade war announcement might be expected to trigger uncertainties on a firm's future business activities since firms need to overcome higher export costs when tariffs increase. As a result, the business of Chinese domestic exporting firms and firms' subsidiaries in the U.S. market would be both negatively affected. This is reflected in lower revenue from overseas after the trade war, and as firms concentrate more on domestic business to offset that overseas loss, the share of overseas revenue in their total revenue drops.

4.2 | Robustness checks

Table 3 presents the results of some sensitivity test of the baseline results. To begin with, the analysis is replicated using alternative measures of trade-war exposure. In the first test, the event window of CARs is limited to only 2 days—the event day (22 March) and the day after (23 March). Since the outbreak of the U.S.–China trade war is completely unpredicted, there is little advance leakage, so 22 and 23 March are considered as capturing investors' responses adequately. Using Equation (2) to calculate the cumulative abnormal returns CAR_i (2 *day*) over the 2 days, and $Exposure_i$ (2 *day*) is defined as the negative of CAR_i (2 *day*). The results shown in Columns (1) to (3) in Panel A1 suggest that the baseline results are robust.

Instead of the daily market return of all firms, the Hushen300 index is then used (e.g., Ding et al., 2020, 2022; Ji & Wei, 2014). This index covers about 70% of the market value of firms that are traded on the Shanghai and/or Shenzhen exchanges, making it one of the main measures of Chinese stock market value. The calculations of Equations (1) and (2) are repeated to generate a CAR_i (*HS*300) and an $Exposure_i$(*HS*300). The coefficients displayed in Columns (4) to (6) of Panel A1 suggest that this alternative change for market returns does not alter the baseline results.

Panel A2 estimates firms' normal returns by alternative factors instead of the market model in Equation (1). The first three columns, following Moser and Rose (2014), add the daily exchange rate between U.S. dollar and the Chinese Yuan together with stock market returns to compute firms' stock responses CAR_i (*Exchange*) and trade-war exposure $Exposure_i$(*Exchange*). In Columns (4) to (6), a Fama–French three factor model is constructed with market risks, market capitalisation and book-to-market ratio (e.g., Huang et al., 2019; Ji & Wei, 2014). The corresponding trade-war exposure is labelled as $Exposure_i$(3 *factor*). The data for all these factors are collected from the CSMAR database. As the panel shows, the regression results are consistent with the main findings in the baseline set.

Another sensitivity analysis is to test whether the baseline results are robust to alternative specifications after the inclusion of additional fixed effects. Firms in our sample are listed in different markets, for example, Shanghai stock exchange, Shenzhen stock exchange and GEM, this

[12]This fact is also shown in Table A2 in the Appendix. It reports that firms experiencing more negative exposure to the trade war have significantly higher U.S. export and U.S. FDI for different groups are almost similar.

[13]Table A3 in the Appendix compares firms' fundamentals based on the extent to which firms are exposed to the trade war. The analysis shows that firms have higher trade-war exposure are those with a better financial statement (e.g., higher ROA, higher liquidity, lower leverage).

TABLE 3 Robustness checks

Panel A1: Alternative measure of trade-war exposure						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Total revenue	**Overseas revenue**	**Overseas share**	**Total revenue**	**Overseas revenue**	**Overseas rhare**
Post * exposure (2 day)	0.0119	−0.1276*	−0.0665*			
	(0.008)	(0.064)	(0.032)			
Post * exposure (HS300)				0.0186*	−0.1679***	−0.1040**
				(0.010)	(0.050)	(0.036)
Post * controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.955	0.857	0.856	0.955	0.857	0.856
Observations	12,878	12,878	12,878	12,878	12,878	12,878
Panel A2: Alternative measure of trade-war exposure						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Total revenue	**Overseas revenue**	**Overseas share**	**Total revenue**	**Overseas revenue**	**Overseas share**
Post * exposure (exchange)	0.0315***	−0.1471*	−0.0900***			
	(0.010)	(0.075)	(0.027)			
Post * exposure (3 factor)				0.0258**	−0.1505**	−0.1011***
				(0.009)	(0.056)	(0.031)
Post * controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.955	0.857	0.856	0.955	0.857	0.856

TABLE 3 (Continued)

Panel A2: Alternative measure of trade-war exposure						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Total revenue	**Overseas revenue**	**Overseas share**	**Total revenue**	**Overseas revenue**	**Overseas share**
Observations	12,878	12,878	12,878	12,878	12,878	12,878
Panel B: Alternative specifications						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Total revenue	**Overseas revenue**	**Overseas share**	**Total revenue**	**Overseas revenue**	**Overseas share**
Post * exposure	0.0242**	−0.0917	−0.0654**	0.0232**	−0.1184*	−0.0908**
	(0.009)	(0.065)	(0.030)	(0.008)	(0.056)	(0.032)
Post * controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Market-year FEs	Yes	Yes	Yes	-	-	-
Sector-year FEs	–	–	–	Yes	Yes	Yes
R-squared	0.955	0.858	0.857	0.957	0.858	0.858
Observations	12,878	12,878	12,878	12,878	12,878	12,878

Note: All non-bivariate variables are winsorised at the 10% level and all independent variables are normalised. All models contain a constant and the interactions between *Post* and initial firm controls, but do not report. Robust standard errors reported in parentheses are clustered at the CSRC 1-digit sector level. ***$p < .01$, **$p < .05$, *$p < .1$.

Columns (1)–(3) add market-year fixed effects; Columns (4)–(6) add sector (CSRC 1-digit)-year fixed effects. All non-bivariate variables are winsorised at the 10% level and all independent variables are normalised. All models contain a constant and the interactions between *Post* and initial firm controls, but do not report. Robust standard errors reported in parentheses are clustered at the CSRC 1-digit sector level. ***$p < .01$, **$p < .05$, *$p < .1$.

makes some heterogeneous across firms. To control for unobserved market factors, the market-year fixed effects are involved in Columns (1) to (3) of Panel B. When in confront with a trade war, the extent to which a sector is affected is different because not all sectors have an overseas business and are equally targeted by the policy shock.[14] Columns (4)–(6) contain sector-year fixed effects to control for any potential time-varying changes at the sector level. Our results strongly hold with alternative specifications. The magnitudes of the interactions are close to that in baseline regression.[15]

4.3 | Heterogeneous effects

4.3.1 | The role of SOEs

Chinese SOEs generally operate with ulterior political purposes. For example, their top managers are politically appointed, and their goals are not sorely economic performance (Amighini et al., 2013; Song et al., 2011; Whalley & Zhang, 2006). As a result, SOEs could enjoy more policy support and preferential treatment in their daily activities, such as better access to financing and looser capital constraints (Buckley et al., 2007; Chan et al., 2012; Ding et al., 2018; Faccio et al., 2006; Feenstra et al., 2014). When faced with trade policy uncertainty, the Chinese government would normally take measures to maintain the SOEs' regular business for reasons of political stability (Wang & Song, 2019). So, compared with SOEs, private firms should have suffered more from the announcement of the U.S.–China trade war, and their business activities should be more likely to have changed after the event.

The CSMAR database reports information about the actual controllers of Chinese listed firms. Those data are used here to identify whether a firm is controlled by the central and local governments and their institutions. On that basis, the sample contains 929 SOEs and 1867 private firms. The mean of *Exposure* for the SOEs is −1.24% and for the other firms, it is 0.74%. Apparently, most private firms are more adversely affected by the announcement. The baseline regression is then re-evaluated separating the SOEs and private firms into different sub-samples. The results are presented in Table 4. Columns (1) and (2) show that both SOEs and private firms that are negatively affected by the trade war experience higher total revenues in the post-announcement period. However, the coefficient for private firms is not significant. This suggests that SOEs are potentially perform better after the trade war. The overseas performance of the two sub-samples also differs significantly. Column (4) shows that for private firms, a one-standard-deviation increase in trade-war exposure is associated with a 14.97% decrease in overseas revenue, while that of SOEs is not significantly affected on average (Column 3). Similarly, the last two columns show that private firms with more negative exposure to the trade war have significantly lower overseas revenue shares, indicating that their business is reallocated from overseas towards the domestic market, but that does not apply to SOEs, since the coefficient of that term is not significant.

[14]Our study highlights the trade policy uncertainty triggered by the announcement on March 22, 2018. The effect of specific tariff measures on products in the following events is beyond our research.

[15]The main findings are not changed when applying Tobit model to test the effects on overseas revenue and overseas share as these two variables contain many zero values. These results are available upon request.

TABLE 4 The role of SOEs

	(1)	(2)	(3)	(4)	(5)	(6)
	Total revenue		Overseas revenue		Overseas share	
	SOE	Private	SOE	Private	SOE	Private
Post * exposure	0.0426***	0.0122	−0.1310	−0.1497*	−0.0840	−0.1064**
	(0.013)	(0.014)	(0.080)	(0.081)	(0.075)	(0.039)
Post * controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fes	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.961	0.944	0.863	0.853	0.862	0.853
Observations	4437	8439	4437	8439	4437	8439

Note: Columns (1), (3) and (5) contain firms controlled by central and local government, the other columns include firms of other types. All non-bivariate variables are winsorised at the 10% level and all independent variables are normalised. All models contain a constant and the interactions between *Post* and initial firm controls, but do not report. Robust standard errors reported in parentheses are clustered at the CSRC 1-digit sector level. ***$p < .01$, **$p < .05$, *$p < .1$.

These results are consistent with the prediction that SOEs' connections with a government provide them with better access to assistance when an unexpected event happens.[16] That helps them to mitigate any negative effects. Private firms, facing more strict trade barriers in the future, find their overseas business relatively more vulnerable. As a result, within-firm reallocation between overseas and domestic business tends to be more profound among private firms.

4.3.2 | The role of foreign exposure

Exports and FDI are two alternative strategies to serve foreign markets, which might have different effects when firms are confronted with trade wars. As bilateral tariffs on import goods increase, exporting firms would suffer the loss from higher trade costs (Huang et al., 2019; Lu et al., 2013). FDI, however, establishing subsidiaries in foreign markets, can naturally provide tariff jumping for overseas business (Blonigen, 2002; Cole & Davies, 2011) or works as an export platform (Ekholm et al., 2007), thus helping multinational firms maintain foreign business. So, firms with exposure to FDI should be less negatively affected by the trade war.

An export-oriented firm is identified as whether the firm has U.S. exports in 2015, based on the information from the Chinese General Administration of Customs that contains Chinese export and import transactions.[17] The export information is merged to each listed firm by matching firm names. This yields 678 exporting firms and 2118 non-exporting firms in our sample. The average trade-war exposure of firms with and without exports in the United States are 0.93% and −0.23%, respectively, indicating that firms with U.S. exports are generally more negatively

[16]To further confirm this notion, comparison of firm financial statement at the initial period between SOEs and private firms are tested. It is found that SOEs are in larger size, but have lower returns, lower liquidity and higher leverage. These disadvantages could prevent them from taking flexible strategies to overcome losses from the trade war. However, they have higher total revenue than others in fact. So, their connections with the government, particularly some favourable policies to them, would be the main reason. This table is not tabulated to save space, but available upon request.

[17]The latest firm-transaction information of China Customs database is for year 2015.

TABLE 5 The role of exporting firms

	(1)	(2)	(3)	(4)	(5)	(6)
	Total revenue		Overseas revenue		Overseas share	
	Exporting	Non-exporting	Exporting	Non-exporting	Exporting	Non-exporting
Post * exposure	0.0273*	0.0242*	−0.1298***	−0.1278	−0.1402***	−0.0680*
	(0.013)	(0.012)	(0.029)	(0.085)	(0.026)	(0.036)
Post * controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.960	0.954	0.864	0.851	0.862	0.848
Observations	3175	9701	3175	9701	3175	9701

Note: Columns (1), (3) and (5) contain firms with export to the U.S. market in 2015, the other columns include samples without export to the United States. All non-bivariate variables are winsorised at the 10% level and all independent variables are normalised. All models contain a constant and the interactions between *Post* and initial firm controls, but do not report. Robust standard errors reported in parentheses are clustered at the CSRC 1-digit sector level. ***$p < .01$, **$p < .05$, *$p < .1$.

affected by the trade war. Then the baseline model is re-estimated with different sub-samples based on the existence of exports and the results are reported in Table 5. As shown in Columns (1) and (2), the total revenue of Chinese firms that are negatively exposed to the trade war is larger in both sub-samples. When applying overseas revenue and overseas share as a dependent variable, the coefficient is significantly negative for exporting firms at the 1% level (Columns 3 and 5), but it loses significance, and its magnitude becomes smaller for firms without exports to the United States (Columns 4 and 6). This indicates that firms with U.S. export negatively sensitive to the trade war tend to shrink their overseas business, but non-exporting firms are not affected. In sum, as exposed to the trade war, the within-firm reallocation is more significant among firms exporting to the United States compared with those without.

Firms can choose different methods to enter the host country through FDI, either cross-border merge and acquisition (M&A) or greenfield investments. We further differentiate the effects of FDI. The cross-border M&A data are from the SDC Platinum database and transaction information for greenfield investment are collected from the fDi Markets database supported by the Financial Times. These two datasets are merged with the CSMAR database based on firms' Chinese names. Then, an FDI firm is identified as whether a firm has any foreign direct investment before 2018. This procedure generates 334 FDI firms and 2462 firms without FDI. The average exposure to trade war of firms with and without FDI are 0.43% and 0.006%, respectively. This reflects that firms with FDI have higher trade-war exposure than non-FDI firms.

Like the examination of export exposure, sub-sample analysis is applied, and the regression results are demonstrated in Table 6. As shown in Columns (1) and (2), non-FDI firms with higher trade-war exposure have significantly higher total revenue in the post-announcement period. Ceteris paribus, a one-standard-deviation increase of trade-war exposure predicts a 2.58% higher total revenue. However, there is no significant connection between trade-war exposure and total revenue among FDI firms. These results are consistent with some studies proposing that FDI firms face higher uncertainties when expanding business in foreign markets (e.g., Aizenman & Marion, 2004; Javorcik et al., 2011), so as exposed to trade policy

TABLE 6 The role of FDI firms

	(1)	(2)	(3)	(4)	(5)	(6)
	Total revenue		Overseas revenue		Overseas share	
	FDI	Non-FDI	FDI	Non-FDI	FDI	Non-FDI
Post * exposure	0.0224	0.0258**	−0.0744	−0.1528**	0.0759	−0.1192***
	(0.015)	(0.010)	(0.205)	(0.064)	(0.168)	(0.029)
Post * controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.970	0.948	0.854	0.855	0.863	0.852
Observations	1596	11,280	1596	11,280	1596	11,280

Note: Columns (1), (3) and (5) contain firms with FDI since 2017, the other columns include samples without FDI. All non-bivariate variables are winsorised at the 10% level and all independent variables are normalised. All models contain a constant and the interactions between *Post* and initial firm controls, but do not report. Robust standard errors reported in parentheses are clustered at the CSRC 1-digit sector level. ***$p < .01$, **$p < .05$, *$p < .1$.

uncertainty under the U.S.–China trade war, they are hard to obtain benefits. For overseas businesses, the coefficient of FDI firms in Column (3) is insignificant, and it is significant and negative for non-FDI firms in Column (4). This implies that firms negatively exposed to the trade war and without FDI have remarkable losses in overseas revenue, but FDI firms do not change their overseas business. It is similar in the last two columns when changing dependent variable to overseas share. FDI firms can avoid increasing tariffs during the trade war by producing and selling products directly or indirectly in local markets (tariff jumping), which generates less reallocation of overseas business.

4.4 | Other dimensions of firm outcomes

This subsection mainly studies how the announcement of U.S.–China trade war affects firm's investment and financing activities. While revenue is a real-time measurement of firm performance, investment and financing provide evidence of firm's future development.

Previous studies have examined the causal relationship between policy uncertainty and firm investment (e.g., Bloom et al., 2007; Bonaime et al., 2018; Handley & Limão, 2015; Liu & Zhang, 2019), stating that firms become more cautious when investing or disinvesting as uncertainty raises. To test the trade war's effect on Chinese firms' investment, we first take the logarithm of the item "Cash paid for purchase and construction fixed assets, intangible assets and other long-term assets" from the cash flow statement to measure total investment, labelled as $Investment_{it}$. The data of foreign investment is extracted from the CSMAR database. Then two variables $Foreign\ investment_{it}$, the logarithm of the aggregated foreign investment, and $Foreign\ investment\ share_{it}$, the ratio of foreign investment value to total investment are applied to explore foreign business and potential reallocation effects. The sample average value of the total investment is ¥118.45 million; the average value of foreign investment among firms with foreign investment is ¥11.20 million.

TABLE 7 Trade war on firm investment and financing

	(1)	(2)	(3)	(4)	(5)	(6)
	Investment			Financing		
	Investment	Foreign investment	Foreign investment share	Total debt	Paid-in capital	Subsidy
Post * exposure	0.0278**	−0.1055**	−0.0240*	0.0236***	0.0294***	0.0410**
	(0.010)	(0.048)	(0.011)	(0.007)	(0.004)	(0.017)
Post * controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.844	0.723	0.698	0.953	0.954	0.791
Observations	12,860	12,195	12,195	12,628	12,628	12,508

Note: All non-bivariate variables are winsorised at the 10% level and all independent variables are normalised. All models contain a constant and the interactions between *Post* and initial firm controls, but do not report. Robust standard errors reported in parentheses are clustered at the CSRC 1-digit sector level. ***$p < .01$, **$p < .05$, *$p < .1$.

We replicate the baseline model with total investment, foreign investment and foreign investment share as a dependent variable, respectively. The results are presented in Columns (1) to (3) of Table 7. Column (1) shows that the sign of our main interaction term is significantly positive at the 5% level, which reflects that firms with negative exposure to the trade war have larger investment in the post-trade-war period. At the margin, a one-standard-deviation increase in trade-war exposure is associated with a 2.78% larger total investment. The second column reports the result of foreign investment. It is found that a one-standard-increase in trade-war exposure predicts a 10.55% lower foreign investment. Column (3) uses foreign investment share, and the coefficient is still significant and negative. These results, like that of firm revenue, suggest that firms being negatively affected by the U.S.–China trade war have higher total investment, which is probably due to additional expenses to overcome potential losses under the trade war. Meanwhile, firms shrink their foreign investment as the U.S. administration demonstrated restrictions on Chinese investment in the U.S. market.

In terms of financing activities, $Total\ debt_{it}$ (logarithm of current and non-current liabilities), $Paid-in\ capital_{it}$ (logarithm of paid-in capital) and $Subsidy_{it}$ (logarithm of government subsidies) are taken into consideration. All the data are retrieved from the CSMAR database. The average total debt in our sample is ¥1871.49 million; the average firm capital is ¥622.96 million. During the whole sample period, 2790 firms have government subsidies, and the average and median value of government subsidies are ¥29.50 million and ¥30.40 million, respectively.

The regression results are reported in the last three columns of Table 7. It shows that a one-standard-deviation increase in trade-war exposure results in 2.36% higher total debt, indicating that firms with higher trade-war exposure raise more debt or delay their accounts payable during the U.S.–China trade war (Column 4). Capital is studied in Column (5), which presents cash and other assets from firm's shareholders. The result indicates that a one-standard-deviation increase in trade-war exposure is related to a 2.94% larger capital. The last column tests the effect of government subsidies as firms that receive government subsidies have more opportunities to capital (Allen et al., 2005; Lim et al., 2018). The coefficient is significantly positive at the 5% level, and

for the magnitude, a one-standard-deviation increase in trade-war exposure is associated with an increase of 4.10% higher government subsidies.

In sum, after the announcement of the U.S.–China trade war, Chinese-listed firms that are severely exposed to the trade war raised more debt and capital and receive more government subsidies. These results also provide potential explanations for our baseline results because firms that reallocate business from overseas to the domestic market require more capital to cover the underlying costs. However, their investment in the overseas market shrank.

5 | CONCLUSION

The outbreak of the trade war on 22 March 2018 aroused uncertainties about its economic consequences for both sides. Analysing data on 2796 Chinese listed firms from 2015 to 2019, this study combines the event-study approach and a DID experiment to examine how the announcement of the U.S.–China trade war affects firm revenues. Chinese firms are found to have an average of 0.1% lower 3-day CARs around the announcement. Firms with severely negative stock returns around the trade war have higher total revenues, but their overseas revenue and total revenues decrease. This reflects a within-firm reallocation from overseas to domestic markets. This effect is different in SOEs and private firms, firms with foreign exposure and without. We also find firms that are adversely sensitive to the trade war increase their total investment but reduce overseas investment, raise more debt and capital, as well as receive more government subsidies after the trade war.

The effects of trade policy uncertainty on the real economy should be taken seriously because any impact on stock returns affects firms' future business activities. Our study finds that the policy shock brings uncertainty and changes firms' business structure. It is important for policymakers to support firms facing difficulties as exposed to the trade war with, for example, multiple financing channels.

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DATA AVAILABILITY STATEMENT

The data used in this study cannot be shared at this time as the data also forms part of an ongoing study.

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APPENDIX A

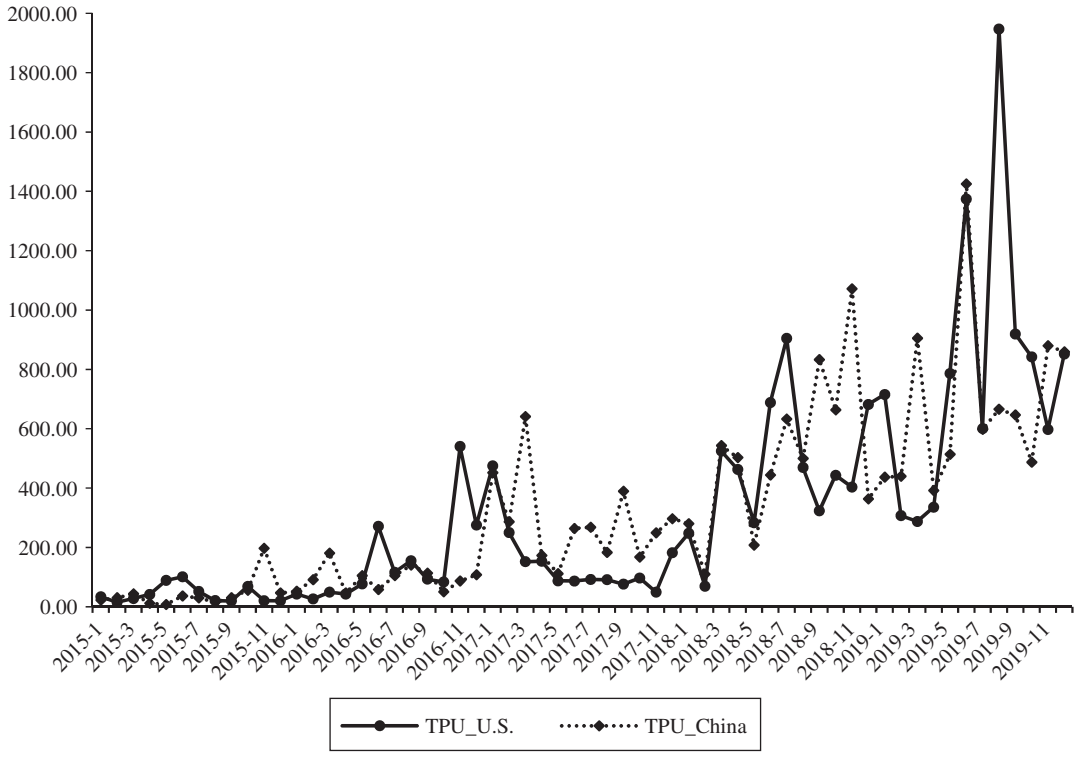

FIGURE A1 Time trend of TPU index

TABLE A1 Variable definition

Variables	Definition	Data sources
Core variables		
Exposure	The cumulative abnormal returns over the event windows of [−1, +1], given the event date as March 22, 2018. $CAR_i[-1,+1] = \sum_{t=-1}^{+1} AR_{it}$, where AR_{it} is the abnormal return adjusted by the market model, which is estimated using the historical data over estimation windows of [−190, −11]. The value-weighted market return is used as benchmark returns. $Exposure = CAR_i[-1,+1] \times (-1)$.	CSMAR
Exposure (2 day)	The cumulative abnormal returns over the event windows of [0, +1], given the event date as 22 March 2018. $Exposure\ (2\ day) = CAR_i[0,+1] \times (-1)$.	CSMAR
Exposure (HS300)	The cumulative abnormal returns over the event windows of [−1, +1], given the event date as 22 March 2018. Hushen300 index is used as benchmark returns. $Exposure\ (HS300) = CAR_i(HS300) \times (-1)$.	CSMAR
Exposure (exchange)	The cumulative abnormal returns over the event windows of [−1, +1], given the event date as 22 March 2018. The value-weighted market return is used as benchmark returns and the exchange rate between the Chinese Yuan and U.S. dollar is used as additional factor in the market model. $Exposure\ (Exchange) = CAR_i(Exchange) \times (-1)$.	CSMAR
Exposure (3 factor)	The cumulative abnormal returns over the event window of [−1, +1], given the event date as 22 March 2018. Fama–French three-factor model is used to estimate normal returns. $Exposure\ (3\ factor) = CAR_i(3\ factor) \times (-1)$.	CSMAR
Total revenue	The logarithm of total revenue.	CSMAR
Overseas revenue	The logarithm of (overseas revenue +1).	CSMAR
Overseas share	(Overseas revenue/Total revenue) *100.	CSMAR
Other variables		
Investment	The logarithm of cash paid for the purchase and construction of fixed assets, intangible assets, and other long-term assets.	CSMAR
Foreign investment	The logarithm of (foreign investment +1).	CSMAR
Foreign investment share	(Foreign investment/total investment) *100.	CSMAR
Total debt	The logarithm of (current liabilities + non-current liabilities).	CSMAR
Paid-in capital	The logarithm of paid-in capital.	CSMAR
Subsidy	The logarithm of government subsidy.	CSMAR

(Continues)

TABLE A1 (Continued)

Variables	Definition	Data sources
Control variables		
ROA	Net profit/total assets.	CSMAR
Liquidity	(Cash and cash equivalents + short-term investments + receivables)/total assets.	CSMAR
Size	The logarithm of total assets.	CSMAR
Leverage	Total liabilities/total assets.	CSMAR

TABLE A2 Bivariate results of overseas business based on firm exposure to trade war

	Exposure < median	Exposure > median	Difference
Export dummy	0.3409	0.4136	−0.0727***
	(0.006)	(0.006)	(0.009)
Export value	4.9816	6.1509	−1.1693***
	(0.090)	(0.095)	(0.131)
FDI dummy	0.0258	0.0261	−0.0003
	(0.002)	(0.002)	(0.003)
FDI number	0.0468	0.0394	0.0074*
	(0.004)	(0.004)	(0.006)

Note: ***$p < .01$, **$p < .05$, *$p < .1$.

TABLE A3 Bivariate results of fundamentals based on firm exposure to trade war

	Exposure < median	Exposure > median	Difference
Size	22.067	21.921	0.145***
	(0.013)	(0.012)	(0.018)
ROA	0.042	0.045	−0.003***
	(0.000)	(0.000)	(0.001)
Leverage	0.415	0.388	0.027***
	(0.002)	(0.002)	(0.003)
Liquidity	0.151	0.171	−0.020***
	(0.002)	(0.002)	(0.002)

Note: ***$p < .01$, **$p < .05$, *$p < .1$.

APPENDIX B

Timeline of the U.S.–China Trade War

This appendix lists key events of the U.S.–China trade war, including U.S. trade policies towards China and how China reacted to or retaliated against the United States.

22 March 2018: The USTR announced to impose import tariffs on about $50 billion of Chinese products and restrict Chinese investment. One day after the presidential memorandum, the Chinese Ministry of Commerce (MOFCOM) released a list of products subject to the Section 232 Investigations imported from the United States and claimed to suspend tariff reduction of approximately $3 billion products.

3 April 2018: The USTR announced that from July 6, the United States would impose a 25% tariff on 1333 Chinese products with a total value of $50 billion. The detailed list was announced on June 15. On the next day, the MOFCOM announced that it would impose a 25% tariff rate on $50 billion U.S. products, including soybeans and other agricultural products, automobiles, chemicals, and airplanes.

3 May 2018: The first round of the U.S.–China Economic and Trade Consultations was held in Beijing. The U.S. demanded China to reduce its trade surplus with the United States by $200 billion between June 201 and May 2020. The United States also asked China to immediately stop subsidising advanced technologies covered by the "Made in China 2025" initials. However, they were unable to reach any agreement.

15 May and 3 June 2018: The second and third round of the U.S.–China Economic and Trade Consultations was held in Washington and Beijing, respectively. Although China and the United States issued a joint statement on 29 May, declaring that both sides would take effective measures to substantially reduce the U.S. trade deficit with China, no practical agreements were reached.

6 July 2018: The first batch of $34 billion taxed products imposed by the United States took effect. China responded by imposing 25% tariffs on $34 billion U.S. agricultural products, including soybeans, automobiles and aquatic products.

11 July 2018: The U.S. announced a new tariff list, announcing that it would impose an additional 10% tariff on $200 billion Chinese goods. On the same day, the MOFCOM indicated that China would take necessary countermeasures.

18 September 2018: The United States further announced a final list of 10% tariffs on $200 billion products to be implemented on 24 September. China announced a tariff list of $60 billion products would be implemented on the same day.

1 December 2018: At G20 Summit in Argentina, the head of China and the United States have agreed to stop imposing new tariffs on each other and would try to reach an agreement within 90 days. Trump agreed to delay increasing tariffs on $200 billion of Chinese imports to 1 January 2020, and China agreed to purchase an additional substantial number of U.S. products.

5 May 2019: The United States increased the tariff rate of the $200 billion products from 10% to 25%, leading to an escalation of this trade war. In retaliation, China announced imposing tariffs on $60 billion U.S. products on 13 May from June 2020.

1 August 2019: Trump announced through social media that the United States would impose 10% tariffs on $300 billion Chinese products. Nevertheless, the USTR announced on 13 August that it would cancel part of the original tariffs plan to be imposed on 1 September and would delay implementing the rest of the list on 15 December, including mobile phones, laptops, video game consoles, some toys, computer monitors and shoes and clothing. From China's aspect, on

23 August, China issued a statement to impose a tariffs rate from 5% to 10% on 5078 items worth about $75 billion. The tariff list was planned to take effect on 1 September 2019 and 15 December 2019. On the next day, Trump stated that from 1 October, the United States would impose an additional 5% tariff on $300 Chinese imports.

1 September 2019: The 15% tariff on $112 billion Chinese products imposed by the United States took effect; meanwhile, China began to impose 5% or 10% tariffs on about 1700 types of U.S. goods.

20 September 2019: China and the United States took part in vice-ministerial-level consultations in Washington. They held constructive discussions on economy and trade issues of common interest and agreed to maintain communication on the tariff issues.

13 December 2019: China and the United States announced reaching a trade agreement to avoid further escalation of the bilateral trade war.

15 January 2020: Chinese representatives and President Donald Trump signed the "Economic and Trade Agreement between China and the U.S." at the White House, indicating a significant turning point in the U.S.–China trade war. This agreement requires China to reform its trade regime of intellectual property, technology transfer, agriculture, financial services, currency and foreign exchange. The United States agreed to reduce the tariff rate from 15% to 7.5% on approximately $120 billion of Chinese imports.