Trade war, media tone and market reaction asymmetry

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Abstract

Purpose – This study investigates the impacts of Chinese media reporting strategy (media tone) on the market performance of US-trade-intensive firms vs non-US-trade-intensive firms and the effect of media tone on the occurrence of good and bad news.

Design/methodology/approach – News texts were retrieved from nine major financial/economic media outlets. Lexical analysis and event study have been adopted to examine the impact of different types of news during the US–China trade frictions on Chinese firms.

Findings – The results show that US-trade-intensive firms vs non-US-trade-intensive firms exhibited different reactions to media coverage. US-trade-intensive firms care more about the governmental attitudes toward the trade war and potential policy supports implied in the official media reports than non-US-trade-intensive firms do. The return-chasing behavior hypothesis is supported by US-trade-intensive investors, and this effect is further enhanced when multiple releases occur on the same day. A higher media tone combined with intensified media releases significantly increases the volatilities of both US-trade-intensive and non-US-trade-intensive firms.

Practical implications – Information provided by this study helps the regulatory authorities to formulate measures to enhance investor confidence and better optimize resource allocation.

Originality/value – This study investigates the asymmetric effect of media tone on US-trade-intensive firms vs non-US-trade-intensive firms, which has not been examined, to the best of the authors' knowledge, in the existing literature.

Keywords China–US trade war, Media tone, Trade-intensive

Paper type Research paper

1. Introduction

This study investigates the impacts of Chinese media reporting strategy (media tone) on the market performance of US-trade-intensive firms vs non-US-trade-intensive firms and the effect of media tone on the occurrence of good and bad news. The trade war between China and the USA brought great uncertainty and instability to the world economy. Chinese direct investment in the USA plummeted by 88%, from a peak of $46.5bn in 2016 to $5bn in 2019 [1]. Such impacts were not limited to outbound foreign direct investment (OFDI) into the USA but spread to the domestic economy.

Besides, the role of trade is not only economic. In the race for global power and influence, trade has replaced traditional military action at the forefront (Harding and Harding, 2019), as shown in Trump's campaign economic policy, including a priority of "eliminating America's chronic trade deficit," particularly with China (Navarro and Ross, 2016; He *et al.*, 2022) find that the impact of this trade war on China's stock market is more like a system risk caused by the contagion effect.

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Given that trade can be an effective tool used to safeguard national security and interests in addition to traditional military weapons and that China faces huge challenges in the trade war, the Chinese government is supposed to have a solid motivation to stabilize the economy and market expectations. They want to convey this message to the public through the media and convince them to stabilize their expectations (Zhang and Du, 2022). The state-controlled media monopolize the discourse of politically sensitive events in China, and the contents and stances of media reports typically convey the governmental policy intention and orientation. Although traditional newspapers, such as *People's Daily*, provide prompt information on the latest incidents and direct viewpoints of the government and are bound to influence the stock market, their effects on the stock market have been seldom investigated. Investigating investors' reactions to media reports can, to a certain extent, show investors' acceptance of the policy orientation transmitted by the government's propaganda system.

All these issues enhance our interest in this study, which aims at investigating the relationship between state-controlled media tone and Chinese stock market reactions in the context of US–China trade frictions.

And this study contributes to the literature in several aspects. Firstly, although studies have examined the impact of trade war events on the stock market, few studies have examined the impacts of media reporting strategies, especially the impacts at the firm level. Secondly, we are the first to differentiate firms that trade heavily with the USA from firms without intensive trade with the USA to test the asymmetric effects of media tone. Thirdly, we contribute to the literature by classifying the major events into good and bad events and investigating the asymmetric effects of media tone on the occurrence of good and bad events. Fourthly, the effect of news release intensity related to US–China trade frictions has been examined for the first time.

The rest of the paper proceeds as follows. Section 2 develops hypotheses based on the related literature. Section 3 describes the methodological design and data. Section 4 reports the empirical results and further discusses them. Section 5 concludes.

2. Literature review

So far, studies on the recent US–China trade war mainly focus on the impact of key events on the stock market and mainly focus on the US market (Selmi, Errami, and Wohar, 2020; Egger and Zhu, 2019, etc.). Also, some evidence has been provided on the Chinese market (He *et al.*, 2022; Goulard, 2020, etc.). Although there have been considerable analyses on the market effects of the US–China trade wars, some important factors have been ignored. A large amount of financial research has proved that media reports, especially media tone, affect investor sentiment and therefore significantly impact asset pricing and corporate financial decisions (Tetlock, 2007; Fang and Peress, 2009; etc.). Although the news media "present themselves as detached observers of market events, they themselves are an integral part of these events" (Shiller, 2015). The media are a carrier of information and an indispensable force in shaping or changing people's beliefs and emotions.

China's propaganda system has a high degree of control over the press [2]. The limited press freedom of the state-controlled media and professional media outlets and the common practice of self-censorship in the media industry enable the Chinese government to use the media to shape public reactions and sentiments toward major international relations events. The state-controlled media monopolize the discourse of politically sensitive events in China, and the contents and stances of media reports typically convey the governmental policy intention and orientation. However, its efficacy has rarely been investigated. It would be worth exploring whether its reporting strategy contributes to market stabilization, as claimed by Xi Jinping, "the propaganda and ideological work should facilitate the future and

destiny of the Party, the long-term peace and stability of the country, and the cohesion and cohesiveness of the nation." [3]

Government policies significantly affect the stock market (Li and Zhou, 2016; Wang *et al.*, 2017; Brunnermeier *et al.*, 2020). But events such as the financial crisis and the rise of trade protectionism have forced countries to frequently adopt multiple sets of policies in response and caused high economic policy uncertainty. As an emerging economy, China is also confronted by a high degree of policy and political uncertainty during its transition to a market economy, especially during the trade war. According to the Economic Policies Uncertainty index constructed by Baker *et al.* (2016), policy uncertainty in China reached a record-high annual average in 2019 (791.87) and remained high at 776.62 during the first five months of 2020 [4]. Speculations about government policies and interventions play a crucial role in driving China's financial market dynamics.

Investigating investors' reactions to media reports can, to a certain extent, show investors' acceptance of the policy orientation transmitted by the governmental propaganda system before its concretion. Evidence has been provided that the official media's tone manipulation is partially effective in preventing a market meltdown and easing investors' worries (Zhang and Du, 2022). Because the extent to which companies are affected by the trade war should be related to their export exposure, analysis at the market level is insufficient to explain the differential impact of the trade war.

Moreover, the empirical finance literature has amply documented the asymmetric response of volatility to good news and bad news, i.e. market volatility tends to rise strongly in response to bad news and fall in response to good news. According to the leverage effects explanation (Chan, 1988; Ball and Kothari,1989), when the stock value drops, the firm becomes more leveraged, leading to higher volatility in stock returns. Another explanation based on the effect feedback of volatility was provided by Campbell and Hentschel (1992), asserting that if volatility is persistent and priced, an increase in the expected future volatility and therefore the required rate of return follows, causing an immediate reduction in current stock prices.

However, Braun *et al.* (1995) assert that predictive asymmetry occurs mainly at the market level, and is weak in idiosyncratic sources of risk for industry portfolios. Their results are more supportive of the conclusions of Chopra *et al.* (1992) that a leverage effect in betas is not sufficient to explain the market's overreaction to winners and losers. Moreover, inconsistent with the findings from US markets (Bae *et al.*, 2007; Krishnamurti *et al.*, 2013) showed that the phenomenon of asymmetric volatility is opposite, that is, volatility increases more with good news than with bad news, on the Shanghai Stock Exchange during bull markets. They argue that the positive impact of good news on volatility is driven by the return-chasing behavior of investors during bull markets, and institutional and behavioral factors are the major driving forces behind observed volatility patterns in the Chinese stock market.

The tortuous trade frictions proceeded with a mixture of good news and bad news. During the long course of the trade frictions, China has both compromised and struggled. Accompanied by the counter-attacks of both sides, ongoing consultations were held and periodic agreements were signed. Tariffs were implemented much less frequently than they have been used as bargaining chips. Because investors' reasoning process (psychology) might change under different circumstances, it is possible that in the occurrence of different types of actual events (trade war situations), the same reporting strategy brings about different effects.

All these issues reinforce our interest in this study, which aims to investigate the asymmetric effect of media tone on US-trade-intensive firms vs non-US-trade-intensive

firms and explore the impact of media tone on the occurrence of advantageous and disadvantageous trade war situations.

3. Data and methodology

3.1 Data sources

In this article, the research sample starts from November 9, 2016, when Donald Trump won the election for US President and extends to January 17, 2020, two days after the US–China phase-one trade agreement was signed on January 15, 2020. The daily returns and volatilities of individual firms have been extracted from the RESSET database.

Given the requirement of the China Securities Regulatory Commission (CSRC) that listed companies must publish relevant information in the "seven newspapers and one journal" and the overriding influence of *People's Daily*, we take reference of relevant studies (You and Wu, 2012; Wang and Wu, 2015) and select People's Daily and other eight major financial/economic media outlets as our research objects, including *People's Daily*, *Shanghai Securities Daily*, *China Daily*, *China Securities Daily*, *Securities Times*, *Financial Times* [5], *Economic Daily*, *China Reform Daily* and *Stock Market Weekly*. All the news texts in the above newspapers were retrieved from their official websites and the Genius Finance database during the sample period. In total, 251 articles were published in 164 days. Given that the influence, popularity and credibility of the professional media (such as commercialized media outlets and financial we-media) were not as good as those of newspapers in China and that a lot of professional media come from the reprint of government newspapers or outlets (especially for politically sensitive issues such as the trade war) and are overall less timely, their reports are not included in our research.

3.2 Measurement of key variables

Definitions of each variable and their data sources are described in Table 1.

3.2.1 Measurement of media tone. Following Tetlock *et al.* (2008), Wang and Wu (2015) and Zhang and Du (2022), we construct the media tone index by the proportion of positive and negative words in the total vocabulary in the media news on "China–US trade." NLPIR Chinese lexical analysis system, the most popular lexical software in China, is adopted to divide every news report into positive and negative phrases using sentiment analysis. Specifically, following Garcia (2013):

$$\text{Media Tone} = \frac{\text{Number of Positive Phrases} - \text{Number of Negative Phrases}}{\text{Total Number of Phrases in the News}}$$

If multiple articles are published on the same day, the average tone is taken. The days following the news release day are given the same tone index until the newly released news updates the old one.

3.2.2 Defining trade-intensive firms and non-trade-intensive firms. Because not all the stocks are exposed to the export business (with the USA) in China, it would be reasonable to assume the firms that are less US-trade-intensive are less exposed to the risk and uncertainty emerging from the trade war. In this study, the 100 largest publicly traded companies by revenue share generated from the USA [6] are defined as US-trade-intensive firms. Given the large proportion of SSE50 in A-shares [7], its components would better represent the market performance compared with other stocks. A group of non-US-trade-intensive firms is constructed with the current and prior SSE50 components included since 2009. The components with significant export revenues in absolute terms have been excluded, and we are left with 95 firms.

Variable name	Description	Source
Abnormal return	Equals the daily return in the event day t minus the expected return derived from the one-year estimation window [−280, −31] using the market model. The percentage sign is omitted in regressions	RESSET database
Abnormal volatility	*The volatility* of individual firms is derived using the GARCH model based on daily returns. *Abnormal Volatility* equals volatility in the event day t minus the one-year average from the estimation window [−280, −31]. The percentage sign is omitted in regressions	RESSET database
Media tone	The media tone index of those "China–US trade" news, constructed based on the sentiment analysis of the articles on "China–US trade" published in People's Daily and other eight major financial and economic media that we have selected	Calculated on public information
Media Tone_R	The media tone rank is calculated on the tone index. *Media Tone* is separated into quintiles and assigned a rank between 1 and 5, which is referred to as media tone rank (*Media Tone_R*), with 1 being the lowest ratio quintile (lowest tone)	Calculated on Media Tone Index
Trade event	A dummy variable, which equals 1 if there is some important trade friction event that happened on day $t-1$ during the US–China trade war, and 0 otherwise	"Timeline: Key dates in the U.S.-China trade war," www.reuters.com/article/us-usa-trade-china-timeline/timeline-key-dates-in-the-us-china-trade-war-idUSKBN1WP23B; "The US-China Trade War: A Timeline," www.china-briefing.com/news/the-us-china-trade-war-a-timeline/; "Trump's Trade War Timeline: An Up-to-Date Guide," www.piie.com/blogs/trade-investment-policy-watch/trump-trade-war-china-date-guide.
Multiple releases	A dummy variable, which equals one if there is more than one releases from the state-controlled media on the same day, and 0 otherwise	Constructed by the author
Change of 10-year bond yield	Equals the 10-year treasury bond yield of the secondary market in day t minus that in day $t-1$	https://cn.investing.com/rates-bonds/
Change of exchange rate	The percentage change of the daily exchange rate (direct pricing method), where the positive number represents the depreciation of the RMB, and the percentage sign is omitted	https://cn.investing.com/currencies/
Change of economic prospect	The "Economic Prospect Index," composed by the Nation Bureau of Statistics, in day t minus that in day $t-1$	Genius database
Change of consumer confidence	The Consumer Confidence Index in day t minus that in day $t-1$	Genius database

Table 1.
Variable definition and sources

3.2.3 Classifying good trade events and bad trade events. In this research, the key 97 trade events along the timeline of US–China trade frictions are classified on whether the trade-war progress (conveyed by the news on facts) brought about a favorable situation for the Chinese economy. In our manual classification, these 97 events are classified into four groups, which include "good for both," "bad for both," "good for the USA and bad for China" and "bad for the USA and good for China" first. Then, the "good for both" and "bad for the USA and good for China" events are treated as good events for the Chinese economy [8]. Admittedly, imposing tariffs on the counterpart may not be ultimately good for the domestic economy because the global value chain is interwoven. Because of the difficulty of disentangling the effects of each trade war event, "good event" is defined more in terms of the will of the Chinese government to counter the USA in the trade war in this study.

3.2.4 Measuring stock market reactions We gauge the impact of trade-friction news on the first/second moment of return distribution using a return/volatility event-study approach. An event study approach is adopted to measure abnormal market returns and volatilities. The days with confounding events are manually identified and excluded from our investigation. Specifically, the announcement days of crucial macroeconomic news, including press conferences on national economic performance, China Purchasing Managers Index Monthly Reports, Monthly Consumer Price Index Reports and Industrial Producer Price Index Monthly Reports from the National Bureau of Statistics, have been deleted to disentangle their potential influences from the impact of the trade war development. Then, it leaves us with 127 news-releasing days.

The individual news announcement-period return of a specific firm is obtained by subtracting the normal or expected return in the absence of the event from the actual return in the event period $AR_{it} = R_{it} - E(R_{it})$ (see Table 1). The market reaction in terms of stock volatilities is calculated using the GARCH(1,1) model [9] following BialKowski *et al.* (2008).

3.3 Baseline model

Regressions are conducted on both the daily abnormal returns (ARs) and abnormal volatilities (AVs) of individual firms, with media tone as the key explanatory variable and some control variables added:

$$AR = \alpha + \beta_0 * Media\ Tone + \beta_0^{'} * Trade\ Event + \Sigma\beta_i * CONTROL + \varepsilon_i \quad (1)$$

$$AV = \alpha + \beta_0 * Media\ Tone + \beta_0^{'} * Trade\ Event + \Sigma\beta_i * CONTROL + \varepsilon_i \quad (2)$$

"*Media Tone*" is the media tone index of news related to the "China–US trade." To mitigate the effect of potential outliers (of a continuous variable), we divide the media tone into five discrete ranks and include the quintile number in the regressions. To differentiate the effects of the media tone of the news released by state-controlled media from the effects of the actual trade events, i.e. what happened in the real world during the trade frictions, we include another key explanatory variable, "*Trade Event*." It equals one if some important trade-friction event(s) happened on day $t - 1$ [10] during the US–China trade war, and 0 otherwise.

Another group of regressions is conducted to examine the effect of media tone on the occurrence of good and bad trade events.

$$AR = \alpha + \beta_0 * Media\ Tone + \beta_0' * Good\ Event * Media\ Tone + \Sigma\beta_i * CONTROL + \varepsilon_i \quad (3)$$

$$AV = \alpha + \beta_0 * Media\ Tone + \beta_0' * Good\ Event * Media\ Tone + \Sigma\beta_i * CONTROL + \varepsilon_i \quad (4)$$

These regressions are also conducted with a cross-term of *Bad Event* and *Media Tone*. Some control variables have been added to control the potential effect of macroeconomic factors, including yield on 10-year treasury bonds, exchange rate, economic prospect and consumer confidence, as shown in Table 1.

4. Empirical results and discussion

4.1 Impact on stock returns: trade-intensive versus non-trade-intensive

Table 2 reports the regressions on the daily ARs of US-trade-intensive firms. The results show that the US-trade-intensive firms produced significant positive reactions to media optimism overall, except for Stage III [11]. The investors of trade-intensive firms with a large share of exports to the USA showed their worries and exhibited a dim view of the optimistic reports at this early stage of the war. But their anxiety was eased again thereafter. So, in most stages, this positive tone often means a harder Chinese stance in the trade war and an expected increase in the relative strength of the Chinese side in the game, which is good (favorable) news for the Chinese economy.

Table 3 reports the regressions on the daily ARs of non-US-trade-intensive firms [12]. The results show that non-US-trade-intensive firms showed indifference to the official attitude during most stages. But the same as with US-trade-intensive firms, the negative coefficient in Stage III shows that non-US-trade-intensive firms reacted negatively to the official optimism/tough stance.

Dependent variable: abnormal return (%) of US-trade-intensive firms			
Intercept	1.625***	1.624***	1.604***
	103.877	103.79	102.069
State-controlled media Tone_R	0.052***	0.050***	0.046***
	10.998	10.618	9.621
Trade event			0.281***
			12.199
Change of 10-year bond yield		2.583**	2.684***
		2.164	2.252
% Change of exchange rate		23.055***	23.869***
		7.839	8.123
Change of economic prospect		−0.483***	−0.483***
		−6.069	−6.074
Change of consumer confidence		0.002	−0.004
		0.101	−0.224
Firm-fixed effect	Y	Y	Y
n	64,755	64,755	64,755
Adjusted *R*-squared	0.027	0.029	0.031

Notes: *t*-values of the coefficients are listed below the coefficients; ***p-value < 0.01, **p-value < 0.05 and ns = not significant

Table 2. Impact of state-controlled media tone on returns of US-trade-intensive firms

Table 3.
Impact of state-controlled media tone on returns of non-US-trade-intensive firms

Dependent variable: abnormal return (%) of non-US-trade-intensive firms			
Intercept	0.031*	0.031*	0.031*
	1.905	1.893	1.905
State-controlled media Tone_R	−0.008*	−0.009*	−0.009*
	−1.694	−1.757	−1.733
Trade event			−0.005
			−0.215
Change of 10-year bond yield		−1.358	−1.359
		−1.082	−1.083
% Change of exchange rate		3.919	3.903
		1.279	1.274
Change of economic prospect		−0.057	−0.057
		−0.687	−0.686
Change of consumer confidence		0.025	0.025
		1.522	1.528
Firm-fixed effect	Y	Y	Y
n	58,686	58,686	58,686
Adjusted *R*-squared	0.004	0.004	0.004

Notes: *t*-values of the coefficients are listed below the coefficients; *p-value < 0.1 and ns = not significant

Combined with the results of Table 2, it indicates that the trade war mainly affects the business prospects of those Chinese firms with close trade links with the USA. In the economic sense, US-trade-intensive firms care more about the governmental attitudes toward the trade war and potential policy supports afterward than non-US-trade-intensive firms do.

Trade event typically produces positive estimated coefficients for US-trade-intensive firms during the first three stages. However, non-US-trade-intensive firms did not get as much investor attention and did not elicit significant market returns (see Table 3). But later on, the "boots fell to the ground." As China and the USA formally committed (in Stage IV) to tariffs implemented in Stage V, investors seemed to quickly realize that the earlier views were utopian and that a trade war would be a serious threat to both countries, as shown in the significant negative coefficient of *Trade Event* for US-trade-intensive firms in Stage V (see Table 2).

4.2 Impact on stock volatilities: trade-intensive versus non-trade-intensive

Table 4 reports the regressions on AVs of firms heavily exposed to trade with the USA [13]. The result shows that the volatilities of these firms increased with media tone for much of the Trump era, with the exception of Stages III and IV. Because in Stages I, II, V and IV, a high media tone led to significant increases in returns for these US-trade-intensive firms, and in Stage III, a positive official attitude led to lower returns (see Table 2) and did not significantly change their volatilities, it is consistent with the destabilizing effect of speculation, arguing that massive buying pressure moves prices far away from fundamentals [14] and the return-chasing hypothesis from Krishnamurti *et al.* (2013). That is, optimistic reports/tough stances from the official media led to higher returns, resulting in more bets on those companies in the market and higher volatilities induced. Only in Stage IV, although these firms experienced increases in return, did their investors become more hesitant to trade and bring about lower volatility. It might also come from easing (securing)

Dependent variable: abnormal volatility (%) of US-trade-intensive firms			
Intercept	−0.034***	−0.031***	−0.039***
	−3.756	−3.394	−4.301
State-controlled media Tone_R	0.003	0.001	−0.001
	1.066	0.487	−0.263
Trade event			0.118***
			9.013
Change of 10-year bond yield		−7.136***	−7.102***
		−10.375	−10.331
% Change of exchange rate		4.056**	4.425***
		2.408	2.629
Change of economic prospect		−0.349***	−0.349***
		−7.695	−7.716
Change of consumer confidence		−0.045***	−0.047***
		−4.949	−5.201
Firm-fixed effect	Y	Y	Y
n	61,282	61,282	61,282
Adjusted *R*-squared	0.004	0.008	0.009

Notes: *t*-values of the coefficients are listed below the coefficients; ***p-value < 0.01, **p-value < 0.05 and ns = not significant

Table 4. Impact of state-controlled media tone on the volatilities of US-trade-intensive firms

their anxieties (expectations) about the firms' future, because a higher official stance might imply potential governmental support, especially for firms more exposed to a trade war.

Table 5 reports the regressions on AVs of non-US-trade-intensive firms [15]. It shows that a higher media tone significantly lowered those firms' volatilities except in Stage I. In contrast with the insignificant reactions in returns, a more positive official attitude did reduce the uncertainties investors of non-US-trade-intensive firms face, which is also

Dependent variable: abnormal volatility (%) of non-US-trade-intensive firms			
Intercept	0.181***	0.182***	0.174***
	28.729	28.906	27.466
State-controlled media Tone_R	−0.075***	−0.075***	−0.077***
	−39.482	−39.643	−40.606
Trade event			0.117***
			12.71
Change of 10-year bond yield		−3.288***	−3.258***
		−6.816	−6.764
% Change of exchange rate		1.963*	2.314**
		1.667	1.967
Change of economic prospect		−0.075**	−0.077**
		−2.377	−2.428
Change of consumer confidence		−0.006	−0.008
		−0.889	−1.236
Firm-fixed effect	Y	Y	Y
n	58713	58713	58713
Adjusted *R*-squared	0.067	0.068	0.07

Notes: *t*-values of the coefficients are listed below the coefficients; ***p-value < 0.01, **p-value < 0.05, *p-value < 0.1 and ns = not significant

Table 5. Impact of state-controlled media tone on the volatilities of non-US-trade-intensive firms

consistent with the destabilizing effect of speculation. Recall the result of Table 4, because investors chase (speculate) more on the US-trade-intensive firms, the non-US-trade-intensive firms would be left with less speculative funds, for the flow of money in the market is unlikely to increase significantly all of a sudden.

Overall, as far as volatility is concerned, investors of these two types of companies exhibited different reactions to media coverage, and there was an asymmetric effect.

4.3 Impact of media tone on stock returns on occurrence of good/bad events

Tables 6 and 7 report the regressions on ARs, with cross-terms of media tone and different types of events [16]. Because the media release days do not necessarily coincide with the key trade event dates, some media reports/news were released when no event happened. So, there are three cross-terms in the regressions.

The result of Table 6 shows that for firms heavily exposed to the trade with the USA, on the occurrence of all three cases, a higher media tone led to higher stock returns for the whole sample. That is, the official media played a role in stabilizing the expectations of trade-intensive firm investors and raising their confidence not only when facing good news but also in adversity.

Table 7 shows that for firms not heavily exposed to US trade, when facing either good events or no events, there were largely no significant reactions to the media tone for the whole sample, but a higher media tone on the occurrence of bad events elicited negative returns overall. With a more positive official attitude, investors expressed worries about the future and reacted negatively when there was no trade event in Stage III, and when there was a good news trade event in Stage IV. But investors' anxieties were eased later on and reacted positively in the next stage. When facing bad trade events, non-trade-intensive firms responded negatively regardless of the official releasing attitudes in four out of six stages, which more likely came from their worries about the economic prospects resulting from the war.

Table 6.
Testing the effect of media tone on returns of the US-trade-intensive firms on occurrence of good/bad event

Dependent variable: abnormal return (%) of US-trade-intensive firms				
Intercept	1.763***	1.731***	1.666***	1.629***
	125.914	118.028	112.162	104.339
Media Tone_R * No trade event	0.005	0.012***	0.030***	0.039***
	1.183	2.614	6.427	8.215
Media Tone_R * Good trade event		0.071***		0.096***
		5.544		7.451
Media Tone_R * Bad trade event			0.199***	0.208***
			17.779	18.465
Change of 10-year bond yield		2.347**	3.018**	2.885**
		1.965	2.531	2.421
% Change of exchange rate		24.089***	19.084***	20.279***
		8.169	6.48	6.878
Change of economic prospect		−0.535***	−0.344***	−0.336***
		−6.732	−4.293	−4.203
Change of consumer confidence		−0.001	0.023	0.021
		−0.044	1.449	1.301
Firm-fixed effect	Y	Y	Y	Y
n	64,755	64,755	64,755	64,755
Adjusted *R*-squared	0.026	0.028	0.032	0.033

Notes: *t*-values of the coefficients are listed below the coefficients; ***p-value < 0.01, **p-value < 0.05 and ns = not significant

Dependent variable: abnormal return (%) of non-US-trade-intensive firms				
Intercept	0.003	0.009	0.021	0.030*
	0.224	0.587	1.328	1.81
Media Tone_R * No trade event	0.001	−0.001	−0.004	−0.006
	0.284	−0.116	−0.775	−1.227
Media Tone_R * Good trade event		−0.018		−0.023*
		−1.371		−1.743
Media Tone_R * Bad trade event			−0.039***	−0.041***
			−3.376	−3.543
Change of 10-year bond yield		−1.302	−1.436	−1.402
		−1.038	−1.144	−1.118
% Change of exchange rate		3.654	4.72	4.41
		1.19	1.536	1.433
Change of economic prospect		−0.048	−0.086	−0.088
		−0.578	−1.038	−1.057
Change of consumer confidence		0.026	0.021	0.021
		1.549	1.236	1.272
Firm-fixed effect	Y	Y	Y	Y
n	58,686	58,686	58,686	58,686
Adjusted *R*-squared	0.004	0.004	0.005	0.005

Notes: *t*-values of the coefficients are listed below the coefficients; ***p-value < 0.01, *p-value < 0.1 and ns = not significant

Table 7. Testing the effect of media tone on returns of the non-US-trade-intensive firms on occurrence of good/bad event

In general, trade-intensive firms and non-trade-intensive firms reacted differently to the official media reporting strategy. US trade-intensive firms were generally more sensitive to official media reports. In contrast, non-US-trade-intensive firms were generally indifferent to trade war news but showed concerns when the trade war situation was disadvantageous to China.

4.4 Impact of media tone on volatilities upon the occurrences of good/bad events

Table 8 reports the regressions on AVs of US-trade-intensive firms, with cross-terms of media tone and different types of events [17]. Although the influence of media tone is not significant when the whole Trump era is investigated, it exhibits different characteristics at each stage. Investors in US trade-intensive firms were more willing to trade, and their return-chasing behavior dominantly influenced the market performance when there was no immediate trade war pressure on the Chinese economy. On the occurrence of good news and bad news, there was a bifurcation in the impact of media tone in four out of six stages for US-trade-intensive firms.

Table 9 shows that a higher media tone consistently decreased those firms' volatilities in three scenarios [18]. Both when facing good and bad events, a higher media tone significantly reduced non-US-trade-intensive firms' volatility in three out of the six stages, and these reductions happened since Stage III.

Therefore, in the face of good and bad events, the divergence of media tone influences is not obvious for non-US-trade-intensive firms. Because US-trade-intensive (non-US-trade-intensive) firms are more (or less) likely to become the targets of speculations facing optimistic official releases, the bifurcation seems reasonable.

4.5 Impact of media tone after accounting for the intensity of media releases

Relying only on the automatically calculated numbers of positive and negative phrases in the news, without considering the intensity of the media release and

Dependent variable: abnormal volatility (%) of US-trade-intensive firms				
Intercept	−0.011	−0.025***	−0.015*	−0.030***
	−1.351	−2.975	−1.799	−3.291
Media Tone_R * No trade event	−0.005**	−0.002	−0.004*	−0.001
	−2.137	−0.73	−1.693	−0.242
Media Tone_R * Good trade event		0.036***		0.037
		4.926		0
Media Tone_R * Bad trade event			0.006	0.009
			0.906	0.151
Change of 10-year bond yield		−7.209***	−7.136***	−7.186***
		−10.481	−10.372	−10.445
% Change of exchange rate		4.554***	3.912**	4.384***
		2.699	2.316	2.592
Change of economic prospect		−0.351***	−0.345***	−0.342***
		−7.762	−7.55	−7.493
Change of consumer confidence		−0.046***	−0.044***	−0.045***
		−5.025	−4.795	−4.899
Firm-fixed effect	Y	Y	Y	Y
n	61,282	61,282	61,282	61,282
Adjusted *R*-squared	0.004	0.008	0.008	0.008

Notes: *t*-values of the coefficients are listed below the coefficients; ***p-value < 0.01, **p-value < 0.05, *p-value < 0.1 and ns = not significant

Table 8.
Testing the effect of media tone on volatilities of US-trade-intensive firms on occurrence of good/bad event

Dependent variable: abnormal volatility (%) of non-US-trade-intensive firms				
Intercept	0.125***	0.144***	0.158***	0.183***
	22.153	24.427	26.307	28.93
Media Tone_R * No trade event	−0.060***	−0.065***	−0.069***	−0.076***
	−34.148	−35.786	−37.36	−39.399
Media Tone_R * Good trade event		−0.054***		−0.064***
		−10.686		−12.472
Media Tone_R * Bad trade event			−0.069***	−0.075***
			−15.713	−16.981
Change of 10-year bond yield		−3.124***	−3.403***	−3.311***
		−6.46	−7.042	−6.861
% Change of exchange rate		0.734	2.985**	2.132*
		0.621	2.524	1.802
Change of economic prospect		−0.002	−0.071**	−0.076**
		−0.051	−2.234	−2.373
Change of consumer confidence		0.002	−0.008	−0.006
		0.384	−1.183	−0.927
Firm-fixed effect	Y	Y	Y	Y
n	58,713	58,713	58,713	58,713
Adjusted *R*-squared	0.061	0.063	0.065	0.068

Notes: *t*-values of the coefficients are listed below the coefficients; ***p-value < 0.01, ***p-value < 0.05, *p-value < 0.1 and ns = not significant

Table 9.
Testing the effect of media tone on volatilities of non-US-trade-intensive firms on occurrence of good/bad event

content, may introduce bias into the results. A robustness test has been performed on the intensity (frequency) of the media release, for the frequency of media reports may indicate the mainstream media's solicitude to each event and the government's position and attitude on the issue. It is reasonable to assume that more media releases

on the same day will attract more investors' attention and elevate the effects of media tone on the market.

Table 10 reports the regressions of "Abnormal Return" (Panel A) and "Abnormal Volatilities" (Panel B) of US-trade-intensive firms and non-US-trade-intensive firms on the intensity of media release, accounting for the joint effects of the media tone and the intensity of media release, proxied by "*Multiple Releases*." As shown in Panel A of Table 10, for US-trade-intensive firms, accounting for the intensity of media releases does not alter the impact of media tone, and intensified media releases strengthened the effects of media tone, because the cross-term containing *Media Tone* and *Multiple Releases* plays a more significant role than *Media Tone* itself. That is, more intensified releases from the state-controlled media combined with an optimistic attitude send positive signals to trade-intensive firms. But for non-US-trade-intensive firms, boosted optimism does not illicit significant reactions on the market. A higher media tone negatively influences those firms after controlling for the intensity of releases, which corresponds to the results in Table 3.

Panel B of Table 10 reports the results on firm-level volatilities. As for US-trade-intensive firms, although the media tone itself does not play a significant role after controlling the intensity of media releases, the cross-term of *Media Tone* and *Multiple Releases* significantly elevates the volatilities of US-trade-intensive firms overall. That is, an intensified media release is likely to enhance return-chasing behaviors. For non-US-trade-intensive firms, after controlling for the intensity of media releases, the media tone still significantly abates firms' volatilities; consistent with the results in Table 5, the coefficients of the cross-term of *Media Tone* and *Multiple Releases* are significantly positive. The frequent releases seem to signal too many uncertainties and upset investors more than a single release.

Tests are further conducted after accounting for the joint effects of media tone and intensified media release on the occurrence of good/bad events, as shown in Table 9 in the supplement file. The results are basically consistent with those in Table 10. For US-trade-intensive firms, the joint effect of media tone and the intensity of media release is significantly positive no matter on occurrence of good events, bad events or no events at all, consistent with the results of Table 6. But for non-US-trade-intensive firms, the joint effects of media tone and intensified media releases are largely weak on the occurrence of either type of event; compared with the negative coefficient of the cross-term, "Media Tone_R*Bad Trade Event" in Table 7, the insignificant coefficient of the cross-term, "Media Tone_R*Bad Trade Event*Multiple Releases," indicates that higher media tone with intensified releases alleviated investors' negative emotions in adversity.

Furthermore, for US-trade-intensive firms, consistent with Table 10, although the media tone itself is still not significant, the cross-term of *Media Tone* and *Multiple Releases* significantly elevates the volatilities of US-trade-intensive firms on the occurrence of each type of event. Considering the largely insignificant joint effects of media tone and type of events in Table 8, we can conjuncture enhanced chasing activities on these stocks when the media releases were intensified.

For non-US-trade-intensive firms, after controlling for the intensity of media releases, the media tone itself significantly abates firms' volatilities, consistent with the results in Table 5. The coefficients of the cross-term of *Media Tone*, *Multiple Releases* and trade events are all significantly positive, with the highest coefficient being "*Media Tone*Multiple Releases*Good Trade Event*." Recall the negative coefficients of the cross-term of *Media Tone* and trade event type in Table 9. It would be reasonable to infer that multiple releases with official optimism could change investors' attitudes toward those non-US-trade-intensive firms, from ignorant (or evasive) to restless (or speculative).

Table 10.
Testing the effect of media tone on abnormal returns/volatilities accounting for the intensity of media releases

	Dependent variable: abnormal returns (%)					
	US-trade-intensive firms			Non-US-trade-intensive firms		
Panel A: The effect of media tone on returns						
Intercept	1.625***	1.612***	1.595***	0.031*	0.033**	0.033**
	103.877	102.905	101.446	1.905	1.992	1.973
State-controlled Media Tone_R	0.052***	0.051***	0.045***	−0.008*	−0.008*	−0.009*
	10.998	10.723	9.496	−1.694	−1.663	−1.717
State-controlled Media Tone_R * Multiple releases		0.146***	0.127***		−0.017	−0.017
		11.452	9.799		−1.292	−1.253
Trade event			0.245***			0.000
			10.522			−0.021
Change of 10-year bond yield			2.708**			−1.360
			2.273			−1.084
% Change of exchange rate			23.703***			3.928
			8.072			1.282
Change of economic prospect			−0.499***			−0.054
			−6.283			−0.659
Change of consumer confidence			−0.002			0.025
			−0.126			1.515
Firm-fixed effect	Y	Y	Y	Y	Y	Y
n	64,755	64,755	64,755	58,686	58,686	58,686
Adjusted *R*-squared	0.027	0.029	0.033	0.004	0.004	0.004

(*continued*)

Table 10.

	Dependent variable: abnormal returns (%)					
	US-trade-intensive firms			Non-US-trade-intensive firms		
Panel B: The effect of media tone on volatilities						
Intercept	−0.034***	−0.051***	−0.052***	0.181***	0.172***	0.167***
	−3.756	−5.666	−5.755	28.729	27.290	26.447
State-controlled media Tone_R	0.003	0.001	−0.002	−0.075***	−0.076***	−0.078***
	1.066	0.390	−0.624	−39.482	−40.110	−40.970
State-controlled media Tone_R * Multiple releases		0.196***	0.191***		0.105***	0.097***
		27.065	26.147		20.606	18.935
Trade event			0.065***			0.090***
			4.926			9.692
Change of 10-year bond yield			−7.088***			−3.251***
			−10.369			−6.768
% Change of exchange rate			4.152**			2.168*
			2.480			1.849
Change of economic prospect			−0.375***			−0.090***
			−8.321			−2.841
Change of consumer confidence			−0.045***			−0.007
			−4.971			−1.057
Firm-fixed effect	Y	Y	Y	Y	Y	Y
n	61,282	61,282	61,282	58,713	58,713	58,713
Adjusted *R*-squared	0.004	0.016	0.020	0.067	0.073	0.076

Notes: *t*-values of the coefficients are listed below the coefficients; ***p-value < 0.01, **p-value < 0.05, *p-value < 0.1 and ns = not significant

From the results, the density of media release basically confirms, and sometimes enhances, the impact on media tone. Most of the cross-terms containing the dummy variable *Multiple Releases* are more significant than *Media Tone by* itself.

4.6 Further discussion

This study investigates the impacts of media tone and the impacting channel with firm-level data. We classified the trade events into two groups, "good events" and "bad events," based on their supposed influence in each country. An event study is used to examine the impact of different types of news during the US–China trade frictions on Chinese firms. However, the division of "good events" and "bad events" is not absolute, for evidence has shown there were some unintended effects of the trade war on the USA and China and third parties. The US and Chinese tariffs have directly hurt targeted firms/sectors abroad, as intended, but they have also hurt firms at home (Egger and Zhu, 2019). Global value chain interdependencies might be the next topic worth discussing, but it is beyond the scope of this article. In this article, "good event" is more about the actions of the Chinese government to counter the USA in the trade war.

The stock market reactions could not be adequately explained without linkage to their psychological disorders during this particular historical period. The psychological effect of the trade war leads to counterintuitive responses from investors. Investor psychology is a complex process. The abnormal behavior in the face of good and bad news may come from their return-chasing behavior (herding) or their anxieties during the trade friction. In the time "anxiety" covered investors' reactions toward media releases, they became susceptible (alert) and even skeptical about what was happening. They may interpret it differently from literal information and become too eager to cut their losses or too afraid to trade. So, there is no definitive explanation for how investors behave in different situations, at different stages and for different types of companies.

Moreover, when interpreting the role of media tone, it is important to note that the official news coverage is not limited to trade events, and the timing of news releases and actual trade events is not necessarily synchronous. Therefore, the inverse regression coefficients of each group do not necessarily represent the two types of influence from a particular event.

Admittedly, quantifying the impact of state-controlled media releases, even the trade war news itself, would be particularly difficult. However, compared with the frequent release of trade war news, other types of news are rare. Event study allows us to look at the market reactions on individual days and during windows with different lengths. Undeniably, other events potentially moved the market, such as continued financial deleveraging, an economic slowdown in emerging markets, and a rise in US dollar interest rates since 2018. Such events put pressure on the stock markets but are difficult to rule out. Besides the way presented, we also adopt different estimation periods to control the seasonality and derive similar results. We boldly conclude that our results captured the major part of the impact of China's official reporting strategies and trade intensity. Our results cautiously add new explanations to the literature in defining trade events, reporting strategy and examining investors' trading behaviors.

5. Conclusion

This study investigates the impacts of media tone on the market performance of US-trade-intensive firms vs non-US-trade-intensive firms and the effect of media tone on the occurrence of good and bad news.

Specifically, we find that investors in these two types of companies exhibited different reactions to media coverage, and there was an asymmetric effect. US-trade-intensive firms

care more about the governmental attitudes toward the trade war and potential policy supports implied in the official media reports than non-US-trade-intensive firms do. The trade events have been further divided into good and bad events, and cross-terms with media tone have been constructed to investigate their influences. In general, trade-intensive firms and non-trade-intensive firms reacted differently to official media reporting strategies. As shown in the stock returns, trade-intensive firms were generally more sensitive to official media reports. In contrast, non-trade-intensive firms are generally indifferent to trade war news but showed concern when the trade war situation was disadvantageous to China. As far as volatility is concerned, there was a bifurcation in market reactions to media tone in four out of six stages based on the occurrence of good news and bad news for US-trade-intensive firms. In contrast, the divergence of media tone influence in the face of good news and bad news is not apparent for non-US-trade-intensive firms.

The result and information offered by this study not only help to explain the anomalies in the financial market and enrich the content of behavioral finance theory, but also help the regulatory authorities to formulate corresponding measures to enhance investor confidence, effectively prevent and control financial risks and better play the capital market's function of optimizing resource allocation.

This study is limited to the impacts of Chinese media reporting strategy (media tone) without considering unilateral and bilateral actions, which usually have different political implications. Future researchers may differentiate how each side acted during the trade frictions and investigate their impacts on the markets as well as the economy.

Notes

1. The data are from *the 2016 Statistical Bulletin of China's OFDI* and *the 2019 Statistical Bulletin of China's OFDI,* China Commercial Publishing House.
2. China ranks 173rd out of 179 on the world press freedom index, by Sasha Gayer – August 1, 2018; see http://wordsandimages.battleface.com/2018s-world-press-freedom-index/
3. Refer to People's Daily Online (Chinese), http://theory.people.com.cn/GB/40557/368340/
4. See www.policyuncertainty.com/china_monthly.html
5. Here, the Chinese newspaper "Financial Times" differs from the UK newspaper "Financial Times." The Chinese Financial Times was founded on May 1, 1987, jointly funded by eight state-owned financial institutions. It is the first news media established in shareholding after China's opening.
6. We refer to the research report "Rising Sino–US trade Frictions: Possible Impacts and Responses" from China International Capital Corporation (CICC), where the Top 100 A-share listed companies with the largest share of revenue from the USA in 2016 are listed in Tables 18 and 19 on the research report.
7. By the end of 2020, the floating market value of China's A-shares was 64.26tn yuan, among which the floating market value of SSE 50 was 7.6tn yuan, accounting for 12% of A-shares.
8. For brevity, the details of classification are not provided here but are available upon request.
9. The volatility is calculated as: $\text{Volatility}_t = \sqrt{h_t}e_t$

$$h_t = a_0 + a_1 r_{t-1}^2 + b_1 h_{t-1}$$

$$e_t \sim \text{iid}\, N(0,1),$$

where h_t and h_{t-1} are the conditional variances of the current and preceding trading days, respectively.

10. Due to the time lag between China and the USA, we adopt the events in day $t-1$ instead of day t, since the trade events are defined by the US media using local time.
11. Regressions on individual stages are provided in Table 1 of the supplement file. The stage division of the trade war is shown in the Appendix of the supplement file.
12. Regressions on individual stages are provided in Table 2 of the supplement file.
13. Regressions on individual stages are provided in Table 3 of the supplement file.
14. For example, Algieri, Brancaccio, and Buonaguidi (2020) find a causal positive relation between speculation and stock price volatility. More studies have been carried out on commodity markets. Daigler and Wiley (1999) find that the general public (categorized as uninformed traders) increases volatility in future markets. Du, Cindy, and Hayes (2011) and Shear (2021) also find a positive influence of speculative activity on future price volatility.
15. Regressions on individual stages are provided in Table 4 of the supplement file.
16. Regressions on individual stages are provided in Tables 5 and 6 of the supplement file.
17. Regressions on individual stages are provided in Table 7 of the supplement file.
18. Regressions on individual stages are provided in Table 8 of the supplement file.

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Supplementary material

The supplementary material for this article can be found online.

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