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The leaders' shadow: Excessive information spillover in the Chinese stock market

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Abstract

This study investigates information spillover from industry leaders to peer firms during the leaders' earnings announcements (EAs) in the Chinese stock market. We find a positive information spillover, which is subsequently corrected when peers announce their own earnings, indicating excessive information spillover (overreaction). We further identify several reasons for the overreaction: (1) investors' overweighing of leaders' earnings in evaluating peers' earnings; (2) investors' abnormal searching and trading behaviours, particularly among retail investors; and (3) peer firms' poor information environment and limits to arbitrage. These findings suggest that overreaction could be more prominent in less mature, retail investor-dominated markets like China.

KEYWORDS

behavioural bias, earnings announcement, information spillover, overreaction, peers effect

JEL CLASSIFICATION

G14, G41, O16, N25

1 | INTRODUCTION

The literature on information spillover documents a significant directional flow of information from industry leaders to smaller peers within the same sector, as larger firms' stock returns tend to precede those of smaller firms. The return of small firms is correlated with the past return of large firms, but not vice versa (Hou, 2007; Lo & MacKinlay, 1990). This phenomenon is attributed to the broader market implications contained in the financial reports of industry leaders, which are closely followed by investors and have a substantial impact on their industry peers due to shared supply chains, regulatory environments and market fundamentals (Anilowski et al., 2007; Bonsall et al., 2013; Hou, 2007; Wu & Mazouz, 2016). It is

also documented that the news release from one firm has an information spillover effect on other non-announcing firms, especially for intra-industry peers firms (Foster, 1981; Pandit et al., 2011).

However, research finds that these spillover effects tend to be corrected in subsequent periods, indicating excessive information spillover. Thomas and Zhang (2008) document the overreaction to EAs of earlier announcers within a fiscal quarter, with subsequent corrections. Similarly, Arif and De George (2020) observe overreactions in semi-annual reporting peer firms to industry bellwethers' quarterly EAs during their non-reporting periods. Both studies highlight temporary mispricing due to initial overreactions and the market's self-correcting mechanism in the US market. This can be explained by investors' limited attention, where recently announcing firms, especially bellwethers, attract more focus.[1] In the absence of focal firms' disclosures, investors seek alternative sources of news. Overconfident investors might overestimate the relevance of peer firm earnings news for valuing other firms (Daniel et al., 1998; Freeman & Tse, 1992). However, a recent study by Chung et al. (2015) shows that the overreaction to early announcers as identified in Thomas and Zhang (2008) has become less significant in recent years due to increased liquidity and higher trading activity.

This study builds upon Thomas and Zhang (2008) and Arif and De George (2020) by examining whether there is an overreaction to leaders' earnings news in an emerging market such as the Chinese stock market. The Chinese stock market is characterized by a higher proportion of retail investors (80% in China vs. 20% in the United States), short-selling constraints, a less developed financial reporting and information dissemination infrastructure and a tendency towards speculation (Liu et al., 2019; Stambaugh & Yuan, 2017). In recent years, retail investors have accounted for 80% of daily trading in the Chinese stock market (Tan et al., 2023). Intra-industry information transfer is often constrained by institutional barriers, such as the non-market-based resource allocation and entry restrictions (Liu et al., 2022). These unique attributes potentially influence the magnitude and persistence of information spillover and overreaction.

However, this study is not merely a replication of previous studies in a different context. It differs from Arif and De George (2020), which focuses on semi-annually reporting peer firms; by including all peers within the industry, this study makes the inferences more generalizable. More importantly, we conduct a set of novel tests to explore the reasons behind overreaction, including investors' earnings forecasts and trading and searching behaviours, which have not been examined in prior studies.

This study examines peer stocks' reactions to industry leaders' earnings news in the Chinese stock market. We identify industry leaders as the three firms with the largest market capitalization in their industries and consider smaller firms as peers if they do not announce their EAs within 1 month prior to leaders' EAs. Our main tests consist of two stages. First, we examine the immediate spillover effect of leaders' earnings news on peer firms during non-announcement periods. Consistent with the findings in the US market (Arif & De George, 2020), we find a significant positive relationship between the 3-day cumulative abnormal return (CAR) of leaders and the contemporaneous CAR of peer firms around leaders' EA window, confirming information spillover from leaders to peers. Second, we examine whether the initial positive spillover is corrected during peers' own earnings announcements. We find a significant negative correlation between peers' CAR around leaders' EAs and around their own subsequent EAs, indicating an initial overreaction to leaders' news that is later reversed.

[1]Investors' limited attention has been widely discussed and documented in the literature (DellaVigna & Pollet, 2009; Hirshleifer et al., 2011; Hirshleifer & Teoh, 2003; Lu, 2022).

We then examine investors' behaviours to explain the observed overreaction. We first investigate investors' earnings forecasts on peers and find a significant negative correlation between peers' responses to leaders' news and their unexpected earnings (*SUE*), confirming that the overreaction is related to investors' overweighing leaders' earnings news when evaluating peers' earnings performance.

Next, we examine investors' attention by focusing on their trading and searching behaviours. Unlike prior studies using aggregated trading volume, we distinguish investors' buying and selling trading volume (Arif & De George, 2020). We find that investors exhibit abnormally high (low) buying volume around leaders' good (bad) EAs. Conversely, investors exhibit abnormally low selling volume around leaders' good EAs but not bad EAs. Since abnormal selling is primarily driven by existing investors and buying volume reflects activity from both new and existing investors, these results shed light on the distinct trading behaviours of the two investor groups. For searching behaviour, we observe a surge in Baidu search volumes for peer firms around leaders' EAs, especially when the news is positive or highly salient, which suggests that retail investors actively seek information on peer firms. This aligns with the idea that investors have limited attention (Hirshleifer & Teoh, 2003) and are more likely to focus on salient, attention-grabbing positive news (Barber & Odean, 2008).

We then examine the roles of institutional and retail investors by comparing their trading behaviours around leaders' EAs. We find that retail investors trade more actively for both positive and negative news, while institutional investors show lower trading activity. Consistent with their searching behaviour, retail investors trade more actively on positive news than negative news. We also find that retail investors' abnormal trading behaviour contributes to market overreactions, whereas institutional investors do not exhibit such behaviour. These findings emphasize the relevance of studying the Chinese stock market, where retail investors dominate.

In subsequent cross-sectional tests, we find that poor information environment and limits to arbitrage contribute to the overaction, consistent with prior research (Arif & De George, 2020; Daniel et al., 1998; Hirshleifer, 2001). Moreover, we investigate and rule out alternative explanations for overreactions by considering potential non-irrational factors, such as risk, firm fundamentals and shared analyst coverage. In further analysis, we find that when peers announce their EAs within 1 month prior to leaders' EAs, information spillover occurs without overreaction. As peers have already announced their EAs, the market's reliance on leaders' news diminishes, resulting in a more accurate incorporation of leaders' news.

Our study contributes to the literature on information spillover in several aspects. Focusing on the Chinese stock market, we document an excessive overreaction to industry leaders' EAs, complementing existing evidence of overreaction by examining an emerging market (Arif & De George, 2020; Chung et al., 2015; Thomas & Zhang, 2008). We extend prior studies by investigating the investor behaviours that drive overreaction. First, we confirm that this overreaction is linked to investors' overweighing leaders' earnings news when evaluating peers' performance, as evidenced by the unexpected earnings (*SUE*). Second, using the Baidu search index, we document abnormal searching around leaders' EAs, extending prior studies that identify abnormal searching around focal firms' EAs (Da et al., 2011; Drake et al., 2012). Third, to the best of our knowledge, this study is the first to examine how different types of investors trade on peers in response to leaders' news. We provide novel evidence that retail investors trade more actively around leaders' EAs, contributing to the overreaction. Fourth, we find that poor information environments and limits to arbitrage exacerbate overreaction in the Chinese market, confirming and complementing findings in the US market (Arif & De George, 2020; Thomas & Zhang, 2008). This suggests that the Chinese market, and potentially other emerging markets, may exhibit stronger overreactions due to the combined impact of retail investor behaviour and less developed market mechanisms compared to the US market. Last, our study aligns with the behavioural finance literature, underscoring the role of cognitive biases, such as overconfidence and limited attention, in driving overreaction.

The remainder of this paper is organized as follows. Section 2 discusses the literature and background. Section 3 introduces the sample and research design. Section 4 presents the main test results. Section 5 examines the mechanism and Section 6 discusses alternative explanations. Section 7 provides further analysis. Section 8 concludes.

2 | BACKGROUND AND RESEARCH QUESTION

Existing research on information transfer within financial markets has demonstrated that large firms, often industry leaders, tend to precede smaller firms in stock return movements. This phenomenon, highlighted by Lo and MacKinlay (1990) and Hou (2007), points out a directional flow of information from firms with substantial market share to their less dominant counterparts. Specifically, Hou (2007) finds that the returns of market leaders predict those of smaller firms within the same industry. This is echoed by Anilowski et al. (2007) and Bonsall et al. (2013), who find that forecasts from these leading firms are rich in macroeconomic-level information and correlate with aggregate market returns. Bratten et al. (2015) provide further evidence that managers of peer firms react to industry leaders' earnings news, as they perceive that this news will influence investors' and other stakeholders' performance expectations for peer firms. While prior studies observe a reversal of information spillover in subsequent periods, indicating an overreaction by investors to other firms' information (Arif & De George, 2020; Thomas & Zhang, 2008), there is scant evidence on whether the overreaction to industry leaders' news exists in emerging market such as China, and an in-depth discussion on the underlying mechanisms of this overreaction remains lacking. To address this gap, we investigate the information spillover from industry leaders to peers, as well as overreaction or underreaction, in the Chinese stock market. More importantly, we extend prior studies by examining the search, buying and selling activities of retail and institutional investors surrounding leader events in the peer group. This approach provides direct evidence of the determinants driving overreactions.

To begin with, we consider whether there is an information spillover from industry leaders to peers in the Chinese market. There are two reasons why information spillover exists. The first reason is high retail investor participation. With retail investors accounting for over 80% of trading volume in the Chinese stock market, they may closely follow the performance and announcements of industry leaders, as they often lack the resources to analyse all firms individually and instead rely on industry leaders as benchmarks. In contrast, institutional investors have access to timely and private information related to peer firms through various channels, including news feeds, professional data and corporate site visits (Cheng et al., 2016). Second, given the high retail investor presence and their likely limited attention, information from industry leaders may disproportionately influence their investment decisions (Barber & Odean, 2008; Lu, 2022). When industry leaders announce earnings news, it captures more attention from retail investors, leading to an immediate market reaction on peer firms. However, spillover may be less significant compared to the US market for the following reasons. First, the Chinese stock market is characterized by short-selling constraints and less sophisticated market mechanisms compared to more developed markets such as the United States. These constraints might limit the efficiency of information dissemination and the ability of market participants to react to information spillover from industry leaders effectively. Second, the popularity of segment trading in China could dilute the information spillover effect, as investors might focus more narrowly on specific sectors or themes, potentially reducing the broader market impact of industry leaders' news. While both possibilities exist, based on the findings in the US market, we posit that:

Hypothesis 1. *There is an information spillover from industry leaders to their non-announcing peers during the leaders' EAs.*

Next, we consider whether there could be an overreaction to leaders' earnings news (i.e. excessive information spillover). Overreactions can stem from disproportionate investor responses to news, driven by cognitive biases such as overconfidence and the misinterpretation of information relevance across firms (Daniel et al., 1998; Freeman & Tse, 1992). Overreaction is more pronounced in the Chinese market due to the high proportion of retail investors, who often follow industry leaders because they lack the resources for comprehensive analysis. This can lead to excessive reactions to leaders' news, as these investors may overinterpret its relevance for peer firms. Additionally, retail investors' behavioural biases, such as overconfidence and limited attention, exacerbate this tendency. Short-sale constraints in the Chinese market can also exacerbate such behaviour, leading to overreaction to positive news from industry leaders. Positive feedback trading, where investors buy stocks following price increases, can further amplify overreactions (Koutmos, 2014; Sutthisit et al., 2012; Wan et al., 2016).

On the contrary, some investors may focus narrowly on peer firms and react sluggishly to leaders' earnings news, leading to underreaction rather than overreaction. The costly requirement for short-selling might also curb overreaction to negative news, resulting in a more balanced market reaction.

Investors may overweigh industry leaders' information, leading to positive information spillover. However, the market corrects these initial overreactions when peer firms announce their earnings, as new firm-specific information recalibrates earlier valuations (Arif & De George, 2020). Nonprofessional investors might disproportionately focus on salient but unreliable information, influencing their portfolio decisions (Griffin & Tversky, 1992). Sophisticated and institutional investors can moderate these extreme reactions, providing a counterbalance and facilitating market corrections. Hence, we posit the following hypothesis:

Hypothesis 2. *There is an overreaction to leaders' news for peers during their non-announcing period and the overreaction will be corrected in the following peers' EA.*

3 | DATA DESCRIPTION AND METHODOLOGY

3.1 | Data and sample

Our dataset includes all A-shares listed on the Shanghai Stock Exchange (SHSE) and the Shenzhen Stock Exchange (SZSE) from 2010 to 2019.[2] The financial data is obtained from the China Stock Market and Accounting Research (CSMAR) database. We exclude stocks with <2 years of trading post-IPO and those under special treatment to avoid the volatility of extreme stock returns. We also exclude firms in the financial industry due to their differences in fundamental information. All firm-quarter observations with missing controls and return data are excluded from our dataset. All continuous variables are winsorized at the 1st and the 99th percentiles.

[2]The decision to exclude data beyond 2020 stems from the shift in societal focus caused by the COVID-19 pandemic. During this period, investor attention shifted significantly towards COVID-related news and concerns, reducing the significance of other topics, including overreactions in financial markets. As a result, the relevance of the overreaction narrative diminished post-COVID. To preserve the integrity and focus of the study, data beyond 2020 is excluded.

3.2 | Research design

The purpose of this study is to explore the transfer of information from intra-industry leaders to their peers. Specifically, it examines how investors in firms with relatively poor information environments leverage news from industry leaders as an alternative information source during periods when peer firms do not announce their own information. We identify industry leaders as the top three companies with the highest market capitalization within their respective industries for each fiscal quarter. We calculate the average returns of peers and the top three largest leaders during the announcement of their EAs and use these averages to represent the new leaders' and peers' reactions. This approach helps to alleviate the issue of duplicate peer observations when analysing three leaders. The industry categorization is based on the secondary level of the 2012 updated industry classification issued by the China Securities Regulatory Commission (CSRC).

Our study is inspired by Arif and De George (2020), which examines the information spillover from industry bellwether firms reporting quarterly to their peers reporting semi-annually. However, our research design incorporates modifications to enhance its applicability to a more generalized setting. Unlike Arif and De George (2020), which focuses on peer firms that report semi-annually, we consider quarterly EAs, as Chinese stock exchanges require listed firms to disclose financial information quarterly. We classify smaller firms (i.e. non-top-three firms) within the same industry as peers if they do not release EAs during the largest firms' announcing windows (i.e. 1 month before leaders' EA).

As investors of smaller firms often face challenges accessing timely and accurate information outside their own announcement periods, they may rely on alternative sources of information from industry leaders. We measure leaders' return around each EA (3-day CAR [−1, +1]) as an alternative source of information. We define the EA date of industry leaders as the event day for information spillover. All peer-quarter observations following the leaders' EAs are considered to be the peers' price reactions centred on the leaders' EA day.

Our main tests consist of two stages. We first employ an event study centred on EAs by industry leaders, examining the immediate information spillover effects on peers during periods when peers do not announce their own EAs. The first stage investigates whether peers react to leaders' EAs during non-announcing periods. In the second stage, we examine whether the market adjusts for any initial information spillover in peers' own subsequent EAs, that is, examine whether the market overreacts or underreacts to leaders' information and subsequently corrects based on peers' own information. Figure 1 illustrates the design.

3.3 | Variable construction

We use the Capital Asset Pricing Model (CAPM) as a benchmark to calculate abnormal returns. Specifically, the CAPM is employed to estimate predicted returns, and the abnormal return is defined as the difference between the actual return and the predicted return. The CAR is calculated as follows:

$$R_{i,t} = a_0 + b_1 R_{m,t} + \mu_{it} \tag{1}$$

where $R_{i,t}$ is the daily return for $stock_i$, and $R_{m,t}$ is the daily market return. We set the estimation window as [−64, −5]. Firms with <60 trading days of return data in the estimation window are excluded from our sample.

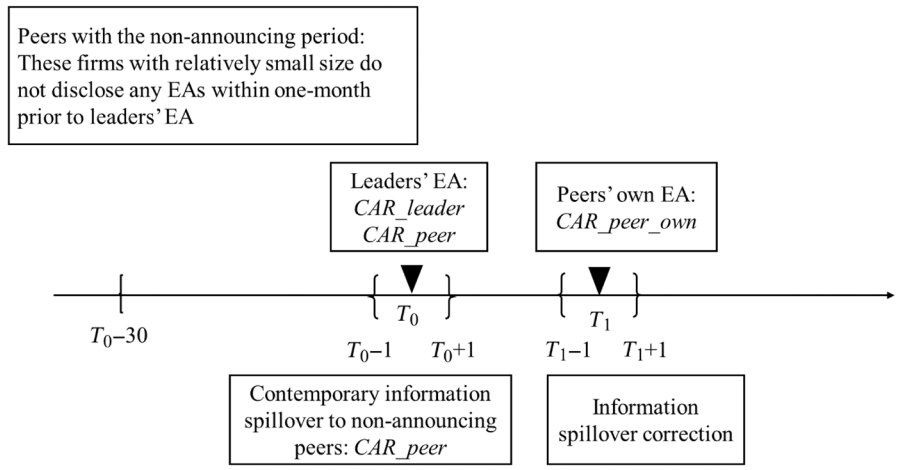

FIGURE 1 Information spillover and overreaction. This figure illustrates the research design of our main tests. We include only peers with the non-announcing period (i.e. non-leader firms that do not disclose any EAs within 1 month prior to the industry leaders' EA). *CAR_leader* is CAR of leaders around the 3-day window centred on leaders' EA. *CAR_peer* is CAR of peers around the 3-day window centred on leaders' EA. *CAR_peer_own* is CAR of peers around the 3-day window centred on their own EAs. We examine the information transfer over $[t_0-1, t_0+1]$ and information spillover reversal over $[t_1-1, t_1+1]$.

The daily abnormal return, $AR_{i,t}$, in the event window is calculated as follows:

$$AR_{i,t} = R_{i,t} - \left(\hat{a}_i + \hat{b}_i R_{m,t}\right)$$

where $\hat{a}_i$ and $\hat{b}_i$ are estimated coefficients from the market model. We apply different event windows to assess short- and long-term market reactions of peers to leaders' news, which is calculated as $CAR_{i,t} = \sum_{t=-1}^{n} AR_{i,t}$. To examine the impact of leaders' news on peers' shares return, for each peer firm, we measure two sets of returns, one for the return over a 3-day window in response to leaders' news (*CAR_peer*) and the other for the return over a 3-day window centred on peers own EAs subsequently (*CAR_peer_own*).

The selection of control variables is based on previous research on information spillover and overreaction (Arif & De George, 2020; Frank & Sanati, 2018; Hou, 2007). Specifically, we include *LSIZE*, defined as the natural logarithm of a firm *i*'s market capitalization at the end of the previous fiscal year, and the book-to-market ratio (*BM*) from the end of the previous fiscal year. We include firm news (*Lnfirmnews*) to control for the potential influence of peer firm's own news, calculated as the natural logarithm of one plus the total number of peer firm's news during the fiscal quarter. We also include annual return momentum (*Mom*) and monthly return volatility (*Vol*) to account for the potential impact of past firm performance.

3.4 | Summary statistics

Table 1 presents the summary statistics. Panel A shows a growing number of firms over time, which is consistent with the expansion of the Chinese stock market. Panel B reports the summary statistics of CARs. Our sample consists of 12,592 leader-peer-quarter level observations.

TABLE 1 Summary of the number of firms and industries, and CARs.

Panel A: Number of industries and firms

	Year									
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Industries	71	72	71	72	72	72	74	76	78	77
Firms	1768	2010	2267	2319	2431	2651	2743	3281	3364	3496

Panel B: Summary statistics for CARs

	N	**Mean (%)**	**SD (%)**	**p25 (%)**	**p50 (%)**	**p75 (%)**
CAR_leader	12,592	−0.566	19.523	−8.790	−0.510	7.475
CAR_peer	12,592	0.040	7.667	−3.463	−0.313	3.009
CAR_peer_own	12,592	0.158	4.774	−1.291	−0.081	1.200
Dum_over	12,592	0.432	0.495	0.000	0.000	1.000

Panel C: Summary statistics for the other variables

	N	**Mean (%)**	**SD (%)**	**p25 (%)**	**p50 (%)**	**p75 (%)**
Control variables						
LSIZE	12,592	22.173	1.353	21.147	21.989	22.974
BM	12,592	1.065	1.218	0.367	0.662	1.249
Vol	12,592	0.133	0.077	0.090	0.118	0.156
Mom	12,592	0.015	0.063	−0.018	0.008	0.038
Lnfirmnews	12,592	1.751	1.211	0.693	1.792	2.565
Robust variables						
SYN	12,592	−0.214	0.858	−0.756	−0.166	0.384
Illiquidity	12,592	0.071	0.365	0.017	0.034	0.067
Dispersion	12,592	0.259	0.276	0.116	0.203	0.325
SUE_peer	12,592	0.095	3.467	−1.260	−0.120	1.141
Dum_Young	12,592	0.417	0.493	0.000	0.000	1.000
Trading and searching variables						
Abtv_buy_Retail	12,592	0.017	1.621	−0.902	−0.017	0.916
Abtv_sell_Retail	12,592	0.058	1.516	−0.790	0.029	0.866
Abtv_buy_Inst	12,592	−0.038	0.971	−0.388	−0.013	0.401
Abtv_sell_Inst	12,592	−0.041	0.911	−0.424	−0.030	0.416
SVI	12,592	−0.066	0.390	−0.183	−0.031	0.120

Note: Panel A of this table describes the number of industries and firms over time, while Panel B presents summary statistics for three types of returns, namely *CAR_leader*, *CAR_peer* and *CAR_peer_own*. *CAR_leader* is leaders' 3-day CAR [−1, 1] centred on leaders' EAs. *CAR_peer* is peers' 3-day CAR [−1, 1] centred on leaders' EAs. *CAR_peer_own* is the peers' 3-day [−1, 1] CAR of peer firms centred on their subsequent EAs. The number of CAR observations are number of firm-quarters when there is no preceding peers' own EAs within 1 month before leaders' EAs. Panel C reports the summary statistics for the other variables used in the empirical analysis.

There is a significant variation in returns during EA periods for both leaders and peers. This variation reflects the diverse nature of information conveyed in EAs, including both positive and negative earnings news.

4 | EMPIRICAL RESULTS OF MAIN TESTS

4.1 | Test of information spillover from leader to peers

In the first stage, we investigate the information spillover from leaders' EAs to non-announcing intra-industry peers using the following equation:

$$CAR\_peer_{i,(t_0-1,t_0+1)} = a_0 + b_1 CAR\_leader_{i,(t_0-1,t_0+1)} + b_2 Controls + \mu_{it} \quad (2)$$

where t_0 is the leaders' EA date. The variable of interest is *CAR_leader*, which captures the market reaction to leaders' earnings news in a 3-day Mar window centred on leaders' EAs ([−1, +1]). The dependent variable is *CAR_peers*, which represents peers' contemporary 3-day CAR centred on leaders' EAs. If there is a positive intra-industry spillover from leader to peers, *CAR_peer* will move in the same direction as *CAR_leader*; that is, the coefficient of *CAR_leader* will be significantly positive. Consistent with prior studies (Hou, 2007; Thomas & Zhang, 2008), Panel A of Table 2 shows that *CAR_leader* is positive and significant (β=0.0466 at the 1% level) with all controls, supporting a positive information spillover from leaders to peers within the same industry over the short term (Hypothesis 1).

Alternatively, we conduct a hedged portfolio analysis, which is long (short) the peers in the highest (lowest) quintile of *CAR_leader*. Panel B of Table 2 shows that the difference of *CAR_peer* between top and bottom quintiles is 0.23%, which is both statistically and economically significant, providing evidence of intra-industry information spillover. Specifically, as leaders' returns increase from the lowest to the highest quintile, the contemporary peers' returns increase from −0.01% to 0.22%, indicating that positive leaders' news tends to generate positive reactions to peers, and vice versa for negative news.[3]

4.2 | Test of correction to leaders' information (overreaction)

In the second stage, we investigate whether investors of non-announcing peers overreact to leaders' EAs. If there is an overreaction, the information spillover from leaders' news to non-announcing peers will be corrected in the subsequent peers' EA windows. To examine the overreaction, we use the following equation:

$$CAR\_peer\_own_{i,(t_1-1,t_1+1)} = a_0 + b_1 CAR\_peer_{i,(t_0-1,t_0+1)} + b_2 Controls + \mu_{it} \quad (3)$$

where t_0 is the leaders' EA date, and t_1 is the peer firm's own EA date. *CAR_peer* is peers' 3-day abnormal return [−1, 1] centred on leaders' EAs. *CAR_peer_own* is the peers' 3-day [−1, 1] abnormal return centred on its own subsequent EAs. If there is an overreaction to leaders' EAs, information spillover from leaders (*CAR_peer*) will negatively predict the peers' CAR in response to its own subsequent EAs (*CAR_peer_own*), indicating that investors overestimate the implications of leaders' earnings news on peers' earnings, and they reverse their valuation when they observe the peers' earnings in the subsequent period (Rashes, 2001).

Table 3 shows a significantly negative relationship between the peers' CAR around the industry leaders' EA (*CAR_peer*), and the CAR around the peers' subsequent own EA (*CAR_peer_own*).[4] This is consistent with Hypothesis 2 that stock prices of peer firms move in the

[3]As a robustness check, we employ an alternative CAR measure based on value-weighted portfolios to account for variations in return calculations. The results (untabulated) remain consistent.

[4]As a robustness check, we employ an alternative 6-month estimation window to calculate the CAR. The results (untabulated) remain unchanged.

TABLE 2 Tests of information spillover around leader's EAs.

Panel A: Regression of peers' CAR on leaders' CAR

DV = *CAR_peer*	**(1)**	**(2)**
CAR_leader	0.0496***	0.0466***
	(4.0517)	(3.8707)
LSIZE	−0.0498	−0.0723*
	(−1.6294)	(−1.9077)
BM	0.0095	0.0167
	(0.3010)	(0.4999)
Vol		0.0465***
		(5.9168)
Mom		−0.0570***
		(−3.5101)
Lnfirmnews		0.1619***
		(4.7270)
Constant	1.1731*	0.8497
	(1.7704)	(1.0248)
Observations	12,592	12,592
Year FE	Y	Y
Industry FE	Y	Y
R^2	0.015	0.030

Panel B: Tests of information spillover: portfolio analysis

Quintiles of *CAR_leader*	***CAR_leader***	***CAR_peer***	**High-Low**
1 (low)	−3.65%***	−0.01%***	0.23%***
2	−1.03%***	−0.14%*	
3	−0.08%**	0.03%*	
4	0.93%**	0.08%**	
5 (high)	4.76%***	0.22%***	

Note: This table presents the results of test of information spillover from industry leaders to peers. Panel A reports regressions of *CAR_peer* on *CAR_leader* as specified in regression (2). Controls include firm size (*LSIZE*), book-to-market ratio (*BM*), peer firm news (*Lnfirmnews*), annual return momentum (*Mom*) and monthly return volatility (*Vol*). See Appendix S1 for variable definitions. Robust standard errors clustered at the firm levels are used to compute the *t*-statistics in parentheses. Panel B reports the contemporary information spillover to peers centred on leaders' EAs day [−1, +1]. *CAR_leader* is leaders' CAR over 3-day window centred on EAs. *CAR_peer* is peers' CAR over 3-day window centred on EAs day. We sort *CAR_leader* into five quintiles from low to high and calculate the equal-weighted portfolio average of peers' contemporary 3-day window CAR centred on leaders' EAs news. High-Low is hedged portfolio return, which is long (short) the peers in the highest (lowest) quintile of return in response to leaders. *** indicates significance at the 1% level, ** indicates significance at the 5% level and * indicates significance at the 10% level.

same direction as the news from industry leaders due to information spillover but reverse when the peer announces its own earnings. This pattern suggests that investors may initially overweight information from industry leaders, potentially overlooking peers' other information during periods when they are not making EAs. This initial positive spillover of information is followed by a reversal, implying that investors shift their focus towards the peers when peer firms eventually disclose their own earnings news.

The findings align with Peng and Xiong (2006)'s category-learning theory, which suggests that with limited attention, investors prioritize market and sector-wide information nsuch as

TABLE 3 Test of overreaction: Regression of peers' return on own EAs on peers' return on leaders' EAs.

DV = *CAR_peer_own*	(1)	(2)
CAR_peer	−0.1632*	−0.1798**
	(−1.7730)	(−2.0145)
LSIZE	0.7286**	1.3081***
	(2.3808)	(3.3965)
BM	0.0030	−0.9623***
	(0.0120)	(−3.0502)
Vol	−2.2190***	−1.9710***
	(−8.5540)	(−6.8188)
Mom		0.6485***
		(5.8431)
Lnfirmnews		−1.3781***
		(−3.5416)
Constant	−13.7609**	−32.5645***
	(−2.1349)	(−3.8537)
Observations	12,592	12,592
Year FE	Y	Y
Industry FE	Y	Y
R^2	0.053	0.136

Note: This table presents regressions of *CAR_peer_own* on *CAR_peer* as specified in regression (3). Controls include firm size (*LSIZE*), book-to-market ratio (*BM*), peer firm news (*Lnfirmnews*), annual return momentum (*Mom*) and monthly return volatility (*Vol*). See Appendix S1 for variable definitions. Robust standard errors clustered at the firm levels are used to compute the *t*-statistics in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

leaders' EAs) over firm-specific information of peers. This explanation is particularly plausible in the context of the Chinese stock market, which is dominated by retail investors. These investors often lack the resources and time to thoroughly analyse firm-specific disclosures, leading them to rely heavily on information from industry leaders as a proxy for the performance of the broader sector.

Additionally, we conduct a hedged portfolio analysis as a validity check, which is long (short) the peers in the lowest (highest) quintile of return in response to leaders. Table 4 shows that *CAR_peer_own* differences between the top and bottom quintiles are negative and significant. The long-short portfolio return is −0.23% (−0.25%) at 1% level for an equal-weighted (value-weighted) portfolio, which is also economically significant. The negative association between *CAR_peer* and *CAR_peer_own* supports Hypothesis 2 of overreaction.

To be noted, in peers' subsequent own EA window, *CAR_peer_own* is negative when *CAR_peer* is negative (Q1 and Q2), suggesting the possibility of underreaction to negative news. To examine the possibility, we conduct the test of overreaction in Table 3 by splitting the sample into positive news and negative news. Untabulated results show that investors overreact to both types of news.

For Q3–Q5 when *CAR_peer* is positive, we find that the magnitude of reversal (*CAR_peer_own*) is larger than the magnitude of the initial information spillover effect (*CAR_peer*), indicating that the market fully reverses its prior reaction. According to Kim et al. (2008), management earnings forecasts contain both positive information due to industry commonalities and negative information due to industry competition. Similarly, leaders' earnings news incorporates both industry-wide information that is positively related to peers' earnings and competition information that is negatively related to peers' (especially its rivals') earnings. It is

TABLE 4 Test of overreaction: Portfolio analysis.

Quintiles of *CAR_peer*	*CAR_peer*	*CAR_peer_own*	BM_Rank	Size_rank
Panel A: Equally weighted portfolio				
1 (low)	−0.14%	−0.02%	2.33	2.12
2	−0.01%	−0.08%	2.01	1.88
3	0.03%	−0.07%	1.61	1.62
4	0.08%	−0.13%	1.86	2.06
5 (high)	0.22%	−0.24%	2.18	2.29
High-Low		−0.23%***		
Panel B: Value-weighted portfolio				
1 (low)	−0.08%	−0.07%	2.06	2.04
2	−0.02%	−0.13%	1.98	2.21
3	0.01%	−0.11%	1.82	1.82
4	0.03%	−0.23%	1.86	1.78
5 (high)	0.12%	−0.31%	2.01	2.02
High-Low		−0.25%***		

Note: This table reports the portfolio analysis of overreaction to leaders' earnings news. *CAR_peer* is leaders' CAR over 3-day window centred on leaders' EAs. *CAR_peer_own* is peers' CAR over 3-day window centred on peers' own EAs. We sort *CAR_peer* into five quintiles from low to high and calculate the equal-weighted and value-weighted portfolio average of peers' CAR centred on their own EAs. High-Low is hedged portfolio return, which is long (short) the peers in the highest (lowest) quintile of return in response to leaders. BM_Rank (Size_Rank) is the average tercile ranks of BM (firm size) of firm-quarters in the same portfolio. *** indicates significance at the 1% level, ** indicates significance at the 5% level and * indicates significance at the 10% level.

possible that investors overweight the positive components of leaders' news and underweight the negative components of leaders' weights. This cognitive bias is more likely to exist in the Chinese stock market, where retail investors dominate.

To address concerns about potential impacts from other fundamental factors, we compare the firm size and book-to-market (*BM*) for the firm quarters across the quintiles.[5] The BM Rank and Size Rank indicate that the observed effects are not driven by book-to-market ratios or firm size, as the two factors do not show a clear correlation with the CARs across quintiles.

5 | TESTS OF THE UNDERLYING MECHANISMS

In this section, we conduct a set of novel tests to investigate the potential reasons that lead to the observed overreaction to leaders' earnings news.

5.1 | Investors' earnings forecasts on peer firms

While extensive evidence shows a positive relationship between CAR around EAs and earnings information conveyed in EAs since Ball and Brown (1968), it is documented that investors

[5]We calculate BM_Rank (Size_Rank) for each quintile portfolio as the average tercile rank of BM (firm size) of firm-quarters in the same portfolio. The lowest tercile is assigned a value of 1, while the highest tercile is assigned a value of 3.

may underreact (Bernard & Thomas, 1989) or overreact to earnings news (Bai & Qin, 2015; Milian, 2015). Additionally, CAR around EAs may incorporate other non-earnings news. To examine whether investors overweight leaders' earnings news and overestimate peers' earnings in the same period, we substitute the dependent variable in Regression (3) (i.e. *CAR_peer_own*) with *SUE_peer* (standard unexpected earnings).

Following Livnat and Mendenhall (2006) and Ding et al. (2023), we *SUE_peer* as:

$$SUE\_peer_{i,q} = \frac{EPS_{i,q} - EPS_{i,q,f}}{p_{i,q}}$$

where $EPS_{i,q}$ is the earnings per share for firm i, quarter q, $EPS_{i,q,f}$ is the median analysts' earnings per share forecasts for firm i, quarter q and $p_{i,q}$ is the closing stock price of firm i at the end of the quarter q. *SUE_peer* measures unexpected earnings surprises, reflecting the release of new information during the peer's own EAs. If the market incorporates earnings information effectively, *SUE_peer* is positively related to the short-term CAR (Kim et al., 2019).

Table 5 shows that the coefficient of *CAR_peer* is significant and negative ($\beta = -0.2690$; t-value $= -3.3185$), indicating that investors overweight industry leaders' earnings news in estimating peers' earnings in the same quarter. This leads to the subsequent reversal in peers' return.

TABLE 5 Test of overreaction: Regression of peers' SUE on peers' return on leaders' EAs.

DV = SUE_peer	**(1)**	**(2)**
CAR_peer	−0.2168***	−0.2690***
	(−2.6268)	(−3.3185)
LSIZE	0.0106	1.3117***
	(0.0431)	(3.4199)
BM	−0.0751	−0.9581***
	(−0.3412)	(−3.0450)
Vol	0.2101**	0.6485***
	(2.2154)	(5.8678)
Mom		−1.3781***
		(−3.5538)
Lnfirmnews		−1.9769***
		(−6.8569)
Constant	−4.4237	−32.6206***
	(−0.7722)	(−3.8765)
Observations	12,592	12,592
Year FE	Y	Y
Industry FE	Y	Y
Adj. R^2	0.058	0.137

Note: This table presents regressions of *SUE_peer* on *CAR_peer* as specified in regression (3). *SUE_peer* is standard unexpected earnings, calculated as the difference between the peers' actual EPS in the subsequent own EAs and peers' median analysts' earnings per share forecasts for the same quarter, divided by the closing stock price at the end of the quarter. Controls include firm size (*LSIZE*), book-to-market ratio (*BM*), peer firm news (*Lnfirmnews*), annual return momentum (*Mom*) and monthly return volatility (*Vol*). See Appendix S1 for variable definitions. Robust standard errors clustered at the firm levels are used to compute the t-statistics in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

5.2 | Investors' search and trading behaviours around leaders' EAs

5.2.1 | Tests of buying and selling volume

As we have identified that the market overreacts to leaders' earnings news during peers' non-announcing periods, we further investigate whether this is due to investors' overconfidence by examining their trading behaviours. According to Odean (1998), Kelley and Tetlock (2013) and Daniel and Hirshleifer (2015), overconfident investors typically expect high profits from trading on their opinions, leading to more aggressive trading behaviour compared to rational investors. This behaviour can result in higher-than-normal trading volumes, as overconfident investors are more likely to buy or sell based on their convictions, regardless of whether those convictions are well-founded (Frank & Sanati, 2018). Investors may overweigh certain information, causing them to believe the information is more current or relevant than it truly is. Consequently, this cognitive bias can encourage investors to trade similarly on the news they prioritize (Drake et al., 2017). Arif and De George (2020) examine and find that abnormal trading volume of semi-annual reporters spikes upward around the industry leaders' EAs for non-reporting periods, suggesting that overconfident trading behaviour contributes to the initial overreaction to leaders' EAs.

However, aggregated trading volume does not distinguish investors' buying and selling behaviours. For new investors who are interested in purchasing stocks of peer firms, they may not have previously held these stocks and might have limited attention to peer stocks. Consequently, they are more likely to be influenced by industry leaders' news, making their buying decisions based on this information. Conversely, for current shareholders of peer firms, their behaviour may differ. As they are already familiar with the fundamentals of the peer firms, they may focus more on peer-specific information. However, they might also be influenced by leaders' news due to their broader interest in industry trends and developments. This dual influence can lead to different trading behaviours among new and existing investors.

To examine investors' buying and selling behaviour, we obtain data on buying and selling volumes from WIND Financial Terminal. Total volume is made up of buying volume and selling volume. The classification of buying and selling volumes is determined based on whether a transaction occurs at the bid price or the asking price. The trading volume is an aggregated measure of trading volumes across all investor categories, including both institutional and retail investors. First, we define normal buying or selling volume as the median value of buying or selling volume in the previous 2 months, equivalent to 40 trading days (Frank & Sanati, 2018). This period is selected as it provides a reasonable sample size to establish a stable baseline while still being responsive to recent trends. The daily firm-level abnormal buying and selling volume is then derived by subtracting the logarithm of normal buying (selling) volume from the logarithm of realized buying (selling) volume for each day. This difference represents the degree to which the observed activity deviates from the expected levels. The equation for daily abnormal buying or selling volume:

$$Abtv\_buy_{i,t} = log\left(Buying\ Volume_{i,t} \right) - log\left(Median\left(Buying\ Volume_{i,t-1,} \ldots, Buying\ Volume_{i,t-40} \right) \right) \tag{4a}$$

$$Abtv\_sell_{i,t} = log\left(Selling\ Volume_{i,t} \right) - log\left(Median\left(Selling\ Volume_{i,t-1,} \ldots, Selling\ Volume_{i,t-40} \right) \right) \tag{4b}$$

Abtv_buy is the abnormal buying volume on news day *t*. *Abtv_sell* is defined as the abnormal selling volume on news day *t*.

To examine whether investors trade on peers when leaders release EAs, we analyse abnormal trading volume surrounding the leaders' news days. We follow Frank and Sanati (2018) to identify good and bad news based on the signs of leaders' CAR around EAs. We expect to observe a significantly positive (negative) abnormal buying volume if new investors pay attention to peers when leaders release good (bad) earnings news. In contrast, we expect to observe a significantly negative (positive) abnormal selling volume if existing investors pay attention to peers when leaders release good (bad) earnings news.

In addition to trading volumes in the month following leaders' EAs, we present trading volumes from 5 days prior to EA days to EA days [−5, 0] due to a significant degree of information leakage in the Chinese stock market (Ma et al., 2021; You et al., 2018). We examine buying and selling volumes in response to good and bad leaders' earnings news separately. We further measure *order imbalance* as the difference between abnormal buying volumes (*Abtv_buy*) and selling volumes (*Abtv_sell*). A positive order imbalance reflects a higher level of buying activity compared to selling. This suggests a prevailing market sentiment favouring the purchase of peers' stock, indicating bullish investor behaviour and general optimism about future stock performance. Conversely, negative order imbalance signifies that investors sell peer stocks around leaders' EA days.

Table 6 Panel A indicates that during the release of good news by industry leaders, there is a significantly positive abnormal buying volume in the periods before, during and after EAs. The significance is sustained over the longer post-announcement window. This suggests that new investors indeed pay attention to and are influenced by the good news from industry leaders, leading them to buy into the peer firms. It is also possible that the positive leaders' news reflects positive news at the industry level, which reinforces the confidence of existing investors in their current holdings. As a result, existing investors may increase their positions. Simultaneously, there is a significantly negative abnormal selling volume, indicating that existing investors are less likely to sell shares during and immediately after leaders' good news announcements, reducing selling pressure on stocks. Order imbalance is significantly positive, indicating that strong buying pressure following good news announcements drives positive CAR of peer firms.

In Panel B, when industry leaders release bad earnings news, there is a significantly negative abnormal buying volume immediately surrounding the EA, indicating a reduced inclination of investors to purchase peer firm stocks. For abnormal selling, the results are mixed. While there is no significant change in abnormal selling immediately after the bad news in the [1, 5] window, the abnormal selling volume becomes significant in the [1, 10] window and persists in the [1, 21] window. This pattern suggests a delayed market reaction to leaders' negative EA. The negative order imbalances indicate higher selling pressure following leaders' bad news announcements. Overall, both new investors and existing shareholders react to leaders' bad news. However, investors react more promptly in buying while existing shareholders eventually increase sales, but with a lag. Combining the results in Panel A and Panel B, the short-term overreaction to good leaders' news ([−5, +5]) could be driven by both new and existing investors. While the short-term overreaction to bad leaders' news could be primarily driven by the immediate decrease in investors' buying behaviour.

5.2.2 | Tests of abnormal search volume index

Previous studies have used the Google search volume index (SVI) as a proxy for retail investors' attention (Da et al., 2011; Drake et al., 2012; Frank & Sanati, 2018). In contrast, institutional investors mainly rely on professional platforms to search for market information, such as Bloomberg (Fedyk & Hodson, 2023). Similarly, in China, institutional investors employ platforms such as Bloomberg, WIND and CSMAR. Da et al. (2011) show that SVI for a firm's

TABLE 6 Abnormal trading volume around leaders' news.

	Abnormal buying				Abnormal selling				Order imbalance			
	Abtv_buy	*t*-Stat	*p*-Value	Sig	*Abtv_sell*	*t*-Stat	*p*-Value	Sig	*Buy-sell*	*t*-Stat	*p*-Value	Sig
Panel A: Trading behaviours on good leaders' news												
[−5, 0]	0.0977	8.7676	0.0000	***	−0.1378	−11.5533	0.0000	***	0.2151	19.2355	0.0000	***
0	0.0946	6.2019	0.0000	***	−0.1861	−10.4091	0.0000	***	0.0871	6.8286	0.0000	***
[1, 5]	0.0809	6.7749	0.0000	***	−0.1044	−7.6720	0.0000	***	0.0978	7.7923	0.0000	***
[1, 10]	0.1407	12.6722	0.0000	***	−0.0587	−4.6701	0.0000	***	0.1726	9.2017	0.0000	***
[1, 21]	0.2057	17.9309	0.0000	***	−0.0154	−1.2921	0.1963		0.1872	10.9821	0.0000	***
Panel B: Trading behaviours on bad leaders' news												
[−5, 0]	−0.0676	−6.284	0.0000	***	−0.001	−0.1067	0.9150		−0.0582	−4.8701	0.0000	***
0	−0.1001	−6.5751	0.0000	***	0.0141	1.0422	0.2973		−0.0973	−7.2677	0.0000	***
[1, 5]	−0.0729	−6.262	0.0000	***	−0.0006	−0.0541	0.9568		−0.0601	−5.3701	0.0000	***
[1, 10]	−0.0221	−2.0631	0.0391	**	0.0422	4.3850	0.0000	***	−0.0407	−2.0561	0.0437	**
[1, 21]	0.0092	0.9137	0.3609		0.0620	6.7811	0.0000	***	−0.0478	−0.9134	0.2179	

Note: This table documents abnormal buying, selling volume to leaders' good and bad news, as determined by an event study of intra-industry leaders' EAs. The event window is centred around the leaders' news and includes the following periods: [−5, 0], [0], [1, 5], [1, 10] and [1, 21]. To define firm-level abnormal trading volume as the difference between the logarithm of realized and normal trade volume on each day. Order imbalance is the difference between abnormal buying volume and selling volume. Normal trading volume is the median value of trading volume in the previous 2months. *** indicates significance at the 1% level, ** indicates significance at the 5% level and * indicates significance at the 10% level.

TABLE 7 Abnormal search volume around leaders' news.

Panel A: Abnormal search volume around leaders' news				
Event window	***Ab_SVI***	***t*-Stat**	***p*-Value**	**Sig**
[−5, 0]	0.0138	4.6197	0.0000	***
0	0.0235	7.4060	0.0000	***
[1, 5]	0.0097	3.4601	0.0000	***
[1, 10]	0.0122	4.5538	0.0000	***
[1, 21]	0.0148	5.2447	0.0000	***
Panel B: Abnormal search volume in *CAR_leader* quintiles				
***CAR_leader* quintiles**	***Ab_SVI***	***t*-Stat**	***p*-Value**	**Sig**
(The lowest) 1	0.0126	2.1280	0.0334	**
2	0.0115	2.4373	0.0148	**
3	0.0090	1.5597	0.1189	
4	0.0229	4.1579	0.0000	***
(The highest) 5	0.0371	8.7062	0.0000	***

Note: This table documents the abnormal Baidu searching index volume surrounding the leaders' news, as determined by an event study of intra-industry leaders' EAs. In Panel A, the event window is centred around the leaders' news and includes the following periods: [−5, 0], [0], [1, 5], [1, 10] and [1, 21]. In Panel B, the event window is centred around the leaders' news day, spanning from [−1, 1]. We define firm-level abnormal searching volume as the logarithm difference between realized and normal searching volume on each day. Normal searching volume is the median value of searching volume in the previous 2 months. *** indicates significance at the 1% level, ** indicates significance at the 5% level and * indicates significance at the 10% level.

ticker is strongly related to retail trading activity on the stock. Drake et al. (2012) document spikes in SVI around firms' EAs. However, whether a similar surge in SVI for peer firms exists around leaders' EAs has not been examined. Given the dominance of Baidu as a search engine in China, we use the Baidu search index to examine retail investors' attention.

Table 7 presents the abnormal Baidu search volume for peers based on their stock tickers. Panel A shows a consistently positive abnormal Baidu search volume (*Ab_SVI*) around leaders' EAs, both before and after the announcements. *Ab_SVI* is positive and significant at the 1% level across all windows, indicating increasing attention from retail investors around the leaders' EAs.

Panel B presents *Ab_SVI* based on *CAR_leader* quintiles. The top quintile, which represents the leaders with the most positive earnings news, has the largest abnormal search volume. *Ab_SVI* for relatively positive news (Q5 and Q4) are larger than that for relatively negative news (Q1 and Q2). This finding aligns with the attention hypothesis, which suggests that investors are more likely to react to salient and attention-grabbing positive news as they have difficulties in selecting the stocks to buy (Barber & Odean, 2008).

Another interesting observation is that larger abnormal search volumes in Q1 (Q5) compared to Q2 (Q4) indicate that attention is particularly pronounced when the leaders have extreme news. When the value of the return is in the middle quintile, there is no significant search for peers. This pattern is also consistent with the limited attention theory (Barber & Odean, 2008; Hirshleifer & Teoh, 2003), which suggests that investors focus on the most impactful information due to cognitive constraints. While Alwathnani et al. (2017) present evidence of market overreaction to extreme earnings news, we build on these findings and reveal that the market particularly overreacts to leaders' extreme earnings news, a phenomenon not previously examined in the literature.

The above findings indicate that investors actively use Baidu search engines to search for peers' information when facing news shocks from leaders, especially when leaders disclose

positive or extreme earnings news. This indicates that investors use industry leaders' news when assessing peers. They may perceive leaders' news as a forward-looking indicator for their peers.

5.3 | The consequence of attention bias

In Section 5.2, we observe abnormal trading activities around leaders' EAs. In this section, we investigate whether investors' trading activities contribute to the overreactions to leaders' news.

To determine whether abnormal trading causes overreactions, we employ the following logistic regression following Frank and Sanati (2018):

$$Dum\_Over_{i,t} = a_0 + b_1 Ab\_tv_{i,t}\left(\text{or } b_1 BSI_{i,t}\right) + b_2 Controls + \mu_{it} \quad (5)$$

Dum_Over (Overreaction indicator) takes the value of one if the sign of peers' CAR on leaders' EA day (*CAR_peer*) is opposite from the sign of peers' CAR on its subsequent own EA day (*CAR_peer_own*). The summary statistics in Table 1 Panel B show that the mean value for *dum_over* is 0.432, indicating that nearly half of the peers experience overreaction. *Ab_tv* is the abnormal trading volume, including sum of buying and selling volumes. $BSI_{i,t}$ is order imbalance on leaders' news day *t*, indicating the difference in buying and selling volumes.

Table 8 Panel A presents the regression results. The coefficient of *Ab_tv* is significantly positive at a 1% level ($\beta = 0.1131$; *t*-value = 7.8602), indicating that investors' abnormal trading is associated with the overreactions following the leaders' news. The coefficient of $BSI_{i,t}$ is significantly positive at a 1% level ($\beta = 0.0570$; *t*-value = 3.5439), indicating that the overreactions are related to buying pressure on leaders' news day.

Table 8 Panel B examines two scenarios of overreaction: a transition from a positive *CAR_peer* to a negative *CAR_peer_own* (*Dum_Pos2Neg*), and from a negative *CAR_peer* to a positive *CAR_peer_own* (*Dum_Neg2Pos*). The results show different trading behaviours in two scenarios. Positive and significant coefficient of *ab_tv* in *Column 1* shows that abnormally high trading volume around leader's EAs is associated with initial *over-optimism to good news*, where peer firms' CAR shift from positive around leader's EA to negative around peer's own EA. Conversely, *Column 2* shows that abnormally low trading volume is associated with *over-pessimism to negative leader's news*, with *CAR_peer* moving from negative around leader's EA to positive around peer's own EA. *Column 3* shows that buying pressure (positive order imbalance) around leaders' EAs is related to overreaction to good news. While *Column 4* shows that selling pressure (negative order imbalance) around leaders' EAs is related to overreaction to bad news.

5.4 | The roles of institutional versus retail investors

By examining the search behaviour, investors tend to search peer firms around leaders' EA. As the users of Baidu search engine are more likely to be retail investors, the result reflects retail investors' abnormal attention. In this section, we use account-level trading data from WIND Financial Terminal to further investigate the two types of investors' trading behaviours around leaders' EAs and peers' EAs. Several studies have employed small trade sizes as an indicator of retail trade (Frank & Sanati, 2018; Hvidkjaer, 2006). Consistent with prior research, we utilize account-level data to assess the buying and selling behaviours of retail and institutional investors. Specifically, trades valued at <40,000 RMB (5714 USD) are categorized as retail investor activity, while those exceeding 1,000,000 RMB (149,420 USD) are considered institutional

TABLE 8 Investors' trading activity and overreactions.

Panel A: Regression of overreaction to leader's EA on trading behaviour

DV = *Dum_over*	(1)	(2)
Ab_tv	*0.1131***	
	(*7.8602*)	
BSI		*0.0570***
		(*3.5439*)
LSIZE	−0.0015	0.0535**
	(−0.0919)	(2.3014)
BM	−0.0088	−0.0071
	(−0.5894)	(−0.3629)
Vol	−0.8616***	−0.4952
	(−3.4516)	(−1.6141)
Mom	−0.0328	0.0290
	(−0.2029)	(0.1375)
Lnfirmnews	−0.0268**	−0.0180
	(−2.0049)	(−0.9943)
Constant	−0.6649*	−1.8324***
	(−1.8507)	(−3.6463)
Observations	12,592	12,592
Year FE	Y	Y
Industry FE	Y	Y
Pseudo R^2	0.006	0.006

Panel B: Regression of directional overreaction to leader's EA on trading behaviour

	(1)	(2)	(3)	(4)
	Dum_pos2neg	***Dum_neg2pos***	***Dum_pos2neg***	***Dum_neg2pos***
Ab_tv	0.0357***	−0.0578***		
	(3.8961)	(−5.9705)		
BSI			0.3149***	−0.2726***
			(12.5027)	(−11.1730)
LSIZE	0.0266	0.1161***	0.0317	0.1460***
	(0.9788)	(3.4853)	(1.1435)	(4.3620)
BM	−0.0164	−0.0159	−0.0197	−0.0128
	(−0.6672)	(−0.5611)	(−0.7564)	(−0.4409)
Vol	−0.0088*	0.0110**	−0.0082*	0.0110**
	(−1.9413)	(2.1945)	(−1.7483)	(2.2056)
Mom	0.0250***	−0.0907***	0.0282***	−0.0911***
	(3.8582)	(−11.1217)	(4.1197)	(−11.2548)
Lnfirmnews	0.0166	−0.0558**	0.0337	−0.0715***
	(0.7475)	(−2.2884)	(1.4731)	(−2.9518)

TABLE 8 (Continued)

Panel B: Regression of directional overreaction to leader's EA on trading behaviour

	(1)	(2)	(3)	(4)
	Dum_pos2neg	***Dum_neg2pos***	***Dum_pos2neg***	***Dum_neg2pos***
Constant	−2.1484***	−3.8092***	−2.2342***	−4.2835***
	(−3.6110)	(−5.2359)	(−3.6195)	(−5.8476)
Observations	9865	9338	9865	9338
Year FE	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Pseudo R^2	0.013	0.036	0.032	0.047

Note: Panel A reports the investors' overreaction to leaders' news. $Dum\_over_{i,t}$ is a dummy variable that equals one if there is the overreaction following the news day, and 0 otherwise. $Ab\_tv_{i,t}$ is defined as the abnormal trading volume on leaders' news day t. $BSI_{i,t}$ is order imbalance on leaders' news day t. Panel B reports the investors' directional overreaction to leaders' news. The dependent variable in Columns 1 and 3 is $Dum\_pos2neg_{i,t}$, which is a dummy variable that equals one if 3-day CAR around leader's EA is positive and 3-day CAR around peer's EA is negative, and 0 otherwise. The dependent variable in Columns 2 and 4 is $Dum\_neg2pos_{i,t}$, which is a dummy variable that equals one if 3-day CAR around leader's EA is negative and three-day CAR around peer's EA is positive, and 0 otherwise. The sample in Columns 1 and 3 exclude observations where $Dum\_neg2pos_{i,t}$ equals one. The sample in Columns 2 and 4 exclude observations where $Dum\_pos2neg_{i,t}$ equals one. Controls include firm size (*LSIZE*), book-to-market ratio (*BM*), peer firm news (*Lnfirmnews*), annual return momentum (*Mom*) and monthly return volatility (*Vol*). See Appendix S1 for variable definitions. Robust standard errors clustered at the firm levels are used to compute the t-statistics in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

investor activity. Investors with trade values falling between 40,000 RMB and 1,000,000 RMB are classified as mid-stock holders.

Table 9 Panels A to D present the trading behaviours of institutional and retail investors around leaders' EAs. For positive earnings news, Panel A shows that institutional investors have abnormally low trading volume for both buying and selling in most windows, except for a marginally high buying volume in the [−5, 0] window. However, the magnitude is much smaller compared to the trading volumes observed after leaders' EAs. This suggests that institutional investors exhibit reduced trading activity during leaders' positive EAs.[6] In contrast, Panel B shows that retail investors exhibit abnormally high trading volumes for both buying and selling during most windows, indicating that retail investors trade more actively during leaders' positive EAs. The increase in buying volume exceeds the increase in selling volume, indicating that retail investors exhibit excessive buying pressure, which could drive the overreaction.[7]

For negative earnings news, Panel C shows that institutional investors have lower trading volumes for most periods, except for a slight increase in the [1, 21] window. In contrast, Panel D shows that retail investors have lower buying volumes and higher selling volumes in response

[6]Institutional investors decrease their trading activities following a positive leader earnings announcement. It is possible that institutional investors have superior access to both leaders' and peers' information, such as corporate site visits, roadshows, private meetings, and professional platforms (Bowen et al., 2018; Cheng et al., 2016, 2019; Jiang & Yuan, 2018). Moreover, they typically use advanced analytical tools and in-depth research, which allows them to form more accurate forecasts before leaders' EA. Consequently, they are less likely to react strongly, because their expectations were already aligned with the outcomes. Additionally, some institutional investors, particularly those with a longer-term focus, may choose to maintain their positions rather than engage in short-term trading in response to earnings announcements. They may reduce trading when the stock price is volatile or when they perceive the stock price as temporarily inflated by short-term traders.

[7]To be noted, the magnitude of institutional investors' abnormal selling is larger than that of retail investors. In aggregate, there is a negative abnormal selling volume for positive news. This indicates that institutional investor behaviour dominates the overall negative abnormal selling volume, which may also contribute to overreaction to positive news. We test the relationship between trading behaviour and overreaction in Panel E.

TABLE 9 Institutional versus Retail investors' trading behaviours on leaders' news.

Panel A: Institutional investors' trading behaviours on good leaders' news

	Abnormal buying				Abnormal selling			
	Abtv_buy	*t*-Stat	*p*-Value	Sig	*Abtv_sell*	*t*-Stat	*p*-Value	Sig
[−5, 0]	0.0440	14.7111	0.0000	***	−0.1147	−8.9198	0.0000	***
0	−0.0239	−3.9388	0.0001	***	−0.1023	−5.5134	0.0000	***
[1, 5]	−0.2226	−14.2347	0.0000	***	−0.1282	−8.9366	0.0000	***
[1, 10]	−0.1456	−10.1740	0.0000	***	−0.0642	−4.8399	0.0000	***
[1, 21]	−0.1061	−7.9565	0.0000	***	−0.0251	−2.0074	0.0447	**

Panel B: Retail investors' trading behaviours on good leaders' news

	Abnormal buying				Abnormal selling			
	Abtv_buy	*t*-Stat	*p*-Value	Sig	*Abtv_sell*	*t*-Stat	*p*-Value	Sig
[−5, 0]	0.0621	6.6460	0.0000	***	0.0343	18.0724	0.0000	***
0	0.0324	2.4245	0.0153	**	−0.0097	−3.2184	0.0013	***
[1, 5]	0.0635	6.1011	0.0000	***	0.0352	14.4451	0.0000	***
[1, 10]	0.1266	13.2287	0.0000	***	0.0356	15.9699	0.0000	***
[1, 21]	0.1630	18.0673	0.0000	***	0.0175	8.2167	0.0000	***

Panel C: Institutional investors' trading behaviours on bad leaders' news

	Abnormal buying				Abnormal selling			
	Abtv_buy	*t*-Stat	*p*-Value	Sig	*Abtv_sell*	*t*-Stat	*p*-Value	Sig
[−5, 0]	−0.1637	−11.6139	0.0000	***	−0.0600	−4.4597	0.0000	***
0	−0.2396	−11.6686	0.0000	***	−0.0896	−4.5764	0.0000	***
[1, 5]	−0.1764	−11.2150	0.0000	***	−0.0708	−4.7160	0.0000	***
[1, 10]	−0.0835	−5.8415	0.0000	***	0.0170	1.2337	0.2173	
[1, 21]	−0.0228	−1.7076	0.0878	*	0.0687	5.2563	0.0000	***

Panel D: Retail investors' trading behaviours on bad leaders' news

	Abnormal buying				Abnormal selling			
	Abtv_buy	*t*-Stat	*p*-Value	Sig	Abtv_sell	*t*-Stat	*p*-Value	Sig
[−5, 0]	0.0032	0.6360	0.5248		0.0407	8.4278	0.0000	***
0	−0.0058	−0.8999	0.3682		−0.0263	−3.2777	0.0010	***
[1, 5]	−0.0336	−5.9676	0.0000	***	0.0383	6.3896	0.0000	***
[1, 10]	−0.0104	−1.9480	0.0514	*	0.0496	8.9701	0.0000	***
[1, 21]	−0.0177	−3.3365	0.0009	***	0.0493	9.2917	0.0000	***

Panel E: Retail vs. institutional investors' trading activity and overreactions

DV = Dum_over	(1)	(2)	(3)	(4)
Ab_tv_retail	0.1568***			
	(10.039)			

TABLE 9 (Continued)

Panel E: Retail vs. institutional investors' trading activity and overreactions

DV = Dum_over	(1)	(2)	(3)	(4)
Ab_tv_inst		0.0019		
		(0.1686)		
BSI_retail			0.0552***	
			(6.9458)	
BSI_inst				−0.0220
				(−0.8749)
LSIZE	−0.0026	−0.0577***	0.0126	0.0129
	(−0.1626)	(−2.6869)	(0.7728)	(0.7860)
BM	−0.0089	−0.007	−0.0106	−0.0102
	(−0.5925)	(−0.3850)	(−0.7050)	(−0.6783)
Vol	−0.9501***	−0.4811	−0.0101***	−0.0074***
	(−3.8240)	(−1.6236)	(−3.8459)	(−2.8204)
Mom	−0.0907	−0.1522	−0.7120***	−0.7097***
	(−0.5502)	(−0.7425)	(−2.8453)	(−2.9175)
Lnfirmnews	−0.0264**	−0.0285*	−0.0272**	−0.0285**
	(−1.9768)	(−1.7016)	(−2.0142)	(−2.1148)
Constant	−0.6472*	−1.8037***	−0.6897*	−0.7162**
	(−1.8016)	(−3.8239)	(−1.9353)	(−2.0070)
Observations	12,592	12,592	12,592	12,592
Year FE	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Pseudo R^2	0.008	0.005	0.006	0.007

Note: This table compares the trading behaviours between institutional investors and retail investors. Panel A and C present institutional investors' abnormal buying, selling volume to leaders' good and bad news, as determined by an event study of intra-industry leaders' EAs. Panel B and D present retail investors' abnormal buying, selling volume to leaders' good and bad news, as determined by an event study of intra-industry leaders' EAs. The event window is centred around the leaders' news and includes the following periods: [−5, 0], [0], [1, 5], [1, 10], and [1, 21]. To define firm-level abnormal trading volume as the difference between the logarithm of realized and normal trade volume on each day. Normal trading volume is the median value of trading volume in the previous 2 months. Panel E reports the investors' overreaction to leaders' news. $Dum\_over_{i,t}$ is a dummy variable that equals one if there is the overreaction following the news day, and 0 otherwise. $Ab\_tv\_retail_{i,t}$ is defined as the retail investors' abnormal trading volume on leaders' news day t. $Ab\_tv\_inst_{i,t}$ is defined as the institutional investors' abnormal trading volume on leaders' news day t. $BSI\_retail_{i,t}$ is defined as the retail investors' order imbalance on leaders' news day t. $BSI\_inst_{i,t}$ is defined as the institutional investors' order imbalance on leaders' news day t. Controls include firm size (*LSIZE*), book-to-market ratio (*BM*), peer firm news (*Lnfirmnews*), annual return momentum (*Mom*) and monthly return volatility (*Vol*). See Appendix S1 for variable definitions. Robust standard errors clustered at the firm levels are used to compute the t-statistics in parentheses. *** indicates significance at the 1% level, ** indicates significance at the 5% level and * indicates significance at the 10% level.

to negative news. The total change in trading volume is positive for most periods, indicating that retail investors are more active in trading leaders' negative news.

The increased trading activity for positive news, as evidenced by both higher buying and selling volumes, suggests that retail investors are more active in trading on leaders' positive news than on negative news. This aligns with the findings in Section 5.2.2, indicating that retail investors tend to search more actively for peer firms when leaders announce positive earnings news than when they announce negative earnings news. This behaviour is consistent with the attention hypothesis (Barber & Odean, 2008), which suggests that individual investors are net

buyers of attention-grabbing stocks due to the difficulty they face in searching the thousands of stocks they can potentially buy.

Panel E further examines whether the investors' trading behaviour contributes to overreaction. In Columns (1) and (2), we replace the *Ab_tv* in Equation (5) with *Ab_tv_retail* (retail investors' abnormal trading volume) and *Ab_tv_inst* (institutional investors' abnormal trading volume). The results show that retail investors' abnormal trading volume contributes to overreaction, while institutional investors' trading volume does not. In Columns (3) and (4), we include *BSI* as an alternative proxy for trading activity. Given that Table 8, Column (2) shows a positive relationship between *BSI* and overreaction, we divide the *BSI* measure into retail and institutional investors to investigate whether trading by retail investors contributes more to overreactions. Consistent with Columns (1) and (2), we find that retail investors' *BSI* is positively related to overreaction (coefficient = 0.0552; *t*-value = 6.9458), while institutional investors' *BSI* shows no significant relationship.

To distinguish between overreaction to good news and bad news, we further analyse the impact of *abnormal trading volume* on overreaction in two scenarios: peers' CAR shifting from positive to negative (i.e. good news) and from negative to positive (i.e. bad news) following leaders' and peers' earnings announcements. Untabulated results show that abnormally high trading volume is related to over-optimism after good news. Retail investors show a positive relationship between abnormal trading volume and overreaction to good news, suggesting they trade more aggressively, contributing to the overreaction. In contrast, institutional investors' trading volume does not significantly affect overreaction to good news, reflecting their more measured trading behaviour.

For bad news, retail investors' abnormal trading volume is still positively related to overreaction, but institutional investors' trading volume is negatively related to overreaction. This suggests that overreaction to bad news is more likely when retail investors trade aggressively, and when institutional investors trade less.

These results, combined with the trading behaviours observed in Table 9 Panels B and D, specifically, retail investors' abnormally high buying during positive leaders' EAs and selling during negative leaders' EAs, suggest that retail investors are a driving force behind market overreactions. This can be attributed to cognitive biases, such as overconfidence, which are more prevalent among retail investors. Overconfident retail investors are more likely to believe they can accurately interpret and act on leaders' news, leading to increased trading activity (Daniel & Hirshleifer, 2015; Odean, 1998).

For order imbalance, the results show that the buying (selling) pressure of both retail and institutional investors is related to overreaction to good (bad) news. As order imbalance captures the directional flow of trades, whether there is more buying or selling, it reflects the investor's sentiment. The results suggest that both types of investors' sentiment are related to overreaction.

5.5 | The effect of information environment on overreaction

In this section, we investigate whether a lack of firm-specific information results in overreaction. A poor information environment can result in either more or less overreaction, depending on how investors respond to the lack of firm-specific data. On the one hand, investors may overreact by relying more heavily on broad market signals, such as industry leaders' earnings announcements, which can amplify spillover effects. This reliance may cause investors to overestimate the relevance of leaders' news to peer firms, resulting in greater overreaction (Hameed et al., 2015; Shroff et al., 2017). On the other hand, in the absence of firm-specific earnings disclosures, leaders' earnings announcements may shift investor attention towards the leaders themselves, leading to reduced attention and trading in peer firms. This lower

level of attention can result in underreaction to the implications of leaders' news for peer firms (Drake et al., 2012; DellaVigna & Pollet, 2009; Trueman, 1994). Additionally, the lack of clear firm-specific information may make investors more conservative, leading to reduced trading activity and a less pronounced overreaction, as uncertainty about the news' implications may cause them to act cautiously.

We estimate the same model specification (Regression 3) with interaction terms that proxy for the firm-specific information environment. Previous studies indicate that overreaction is more pronounced when it is difficult to evaluate the focal firm and challenging to integrate external information to assess the firm's value (Daniel et al., 1998; Hirshleifer, 2001). We first use analyst forecast dispersion as a proxy of poor information environment.[8] Analyst forecast dispersion is defined as the standard deviation of analysts' EPS forecasts, scaled by the absolute value of actual *EPS*. The significantly negative coefficient for the interaction term (Table 10 Column 1) indicates a higher level of CAR reversal at peers' own EAs (or initial overreaction at leaders' EAs) if the peer firm's information environment is poor. Economically, one standard deviation increase in dispersion (poorer information environment) is associated with a 0.875% decrease in *CAR_peer_own*, when *CAR_peer* is held constant at its mean (stronger overreaction).[9] To validate our findings, we use an alternative measure of poor information environment, stock price synchronicity. It measures how well a firm's stock price movement reflects its firm-specific information (Column 2) (Morck et al., 2000; Roll, 1988). The high value of stock price synchronicity indicates a poor information environment. The result is similar to that in Column 1. One standard deviation increase in synchronicity (poorer information environment) is associated with a 0.42% decrease in *CAR_peer_own*, when *CAR_peer* is held constant at its mean, which is economically significant. In general, young firms lack adequate earnings records and may rely more heavily on news from leaders. Therefore, we use *Dum_young* as a proxy for a relatively poor information environment, where *Dum_young* is set to 1 for young firms whose age, measured from their initial public offering (IPO), is below the median age of their industry peers. We introduce the interaction term *Dum_young*CAR_peers* and regress *CAR_peer_own* on this proxy. The procedure follows the same methodology as the previous two proxies for a poor information environment, namely, analyst forecast dispersion and stock synchronicity. Specifically, the coefficient of *Dum_Young*CAR_peer* is negatively significant at the 5% level (coefficient = −0.3944; *t*-value = −2.1244), suggesting that young firms with limited earnings histories exhibit more pronounced return corrections in response to information spillovers. Economically, young firms (poorer information environment) are associated with a 1.58% decrease in *CAR_peer_own*, when *CAR_peer* is held constant at its mean (stronger overreaction).

5.6 | Limits to arbitrage

Studies on pricing anomalies have documented that macrostructure effects can affect arbitrage limits to some extent through illiquidity and turnover proxies (Barberis & Thaler, 2003; Shleifer & Vishny, 1997; Thomas & Zhang, 2008). We include a proxy for arbitrage limits, specifically stock illiquidity, to examine the variation in overreaction to leaders' news depending

[8]Analyst forecast dispersion serves as a proxy for a poor information environment because it reflects differences in the quality and availability of information among analysts. Greater dispersion indicates higher information asymmetry, suggesting that the firm's disclosures are unclear or incomplete, leading to uncertainty and varied interpretations (Atiase & Bamber, 1994; Lobo & Tung, 1997).

[9]Change of *CAR_peer_own* = Coefficient of Interaction × Standard Deviation of Dispersion × Mean of *CAR_peer* = −0.7907 × 0.2770 × 0.040 = −0.00875.

TABLE 10 Test of mechanism: Information environment.

DV = CAR_peer_own	(1)	(2)	(3)
CAR_peer	0.6984***	0.6879***	−0.3156***
	(11.5934)	(12.4622)	(−2.6876)
Dispersion	−0.1286		
	(−0.1286)		
*Dispersion*CAR_peer*	−0.7907***		
	(−2.5813)		
SYN		−0.0860	
		(−0.2449)	
*SYN*CAR_peer*		−0.1219**	
		(−2.2265)	
Dum_Young			0.8741
			(1.0993)
*Dum_Young*CAR_peer*			−0.3944**
			(−2.1244)
LSIZE	1.8470***	1.4385***	1.5630***
	(5.6640)	(3.7517)	(5.2406)
BM	−0.7703***	−0.6416**	−1.2032***
	(−2.7909)	(−2.1197)	(−4.3880)
Vol	0.6700***	0.6337***	0.6402***
	(4.8197)	(6.0589)	(5.3377)
Mom	−1.3140***	−1.2750***	−1.4829***
	(−3.0449)	(−3.4953)	(−3.0641)
lnfirmnews	−2.5596***	−2.2543***	−2.1484***
	(−8.3702)	(−8.1218)	(−7.3285)
constant	−44.3405***	−35.4336***	−37.1006***
	(−6.1201)	(−4.2273)	(−5.4227)
Observations	9954	12,592	12,592
Year FE	Y	Y	Y
Industry FE	Y	Y	Y
Adj. R^2	0.161	0.161	0.140

Note: This table presents regressions of *CAR_peer_own* on *CAR_peer* with information environmental interaction terms. *Dispersion* is analyst forecast dispersion; *SYN* is stock price synchronicity; *Dum_young* is a dummy variable for the young firm. Controls include firm size (*LSIZE*), book-to-market ratio (*BM*), peer firm news (*Lnfirmnews*), annual return momentum (*Mom*) and monthly return volatility (*Vol*). See Appendix S1 for variable definitions. Robust standard errors clustered at the firm levels are used to compute the *t*-statistics in parentheses. *, ** and *** indicate satistical significance at the 10%, 5% and 1% level, respectively.

on the presence of arbitrage impediments. Arbitrageurs may be hindered from capitalizing on these anomalies if market frictions are substantial, causing overreaction to last for a longer period (Fang & Peress, 2009; Frank & Sanati, 2018). A large block of trades could induce very-short-term price reversals for illiquid stocks due to price pressure (Avramov et al., 2006). On the contrary, illiquidity may reduce the extent of spillover. The limited number of trades could slow the incorporation of leaders' news to peer firms' stock price, resulting in a weaker or more delayed spillover. While Thomas and Zhang (2008) and Arif and De George (2020) provide

TABLE 11 Test of mechanism: Limit to arbitrage.

	(1)	(2)
DV = *CAR_peer_own*	**Low illiquidity**	**High illiquidity**
CAR_peer	−0.0104	−0.3600***
	(−0.0614)	(−2.5993)
LSIZE	1.0815	2.1306***
	(0.7871)	(4.5141)
BM	−0.6403	−0.7087*
	(−0.6423)	(−1.9288)
Vol	0.6467***	0.4542***
	(3.9432)	(3.3978)
Mom	−1.2686**	−2.0631***
	(−2.2112)	(−11.8418)
Lnfirmnews	−1.4989***	−1.9440***
	(−2.8068)	(−5.2742)
Constant	−27.1228	−48.8692***
	(−0.9416)	(−4.4678)
Observations	4122	4267
Year FE	Y	Y
Industry FE	Y	Y
R^2	0.147	0.135

Note: This table presents regressions of *CAR_peer_own* on *CAR_peer* as specified in regression (3) by splitting the sample based on level of illiquidity. Controls include firm size (*LSIZE*), book-to-market ratio (*BM*), peer firm news (*Lnfirmnews*), annual return momentum (*Mom*) and monthly return volatility (*Vol*). See Appendix S1 for variable definitions. Robust standard errors clustered at the firm levels are used to compute the *t*-statistics in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

some evidence that overreaction is more pronounced for illiquid stocks in the US context, whether a similar moderating effect exists in the Chinese stock market remains unexamined.

We define stock illiquidity as the absolute value of the price change per dollar to the volume of daily trading and split the sample into low and high illiquidity based on the median value of illiquidity within a given industry and year. The potential observation losses are due to some firms missing data for illiquidity measures. Table 11 shows that in the subsamples with greater illiquidity (Column 2), the coefficient of information spillover is significantly negative, suggesting that firms with less liquid stocks may take longer to correct pricing anomalies due to the challenges of arbitrage. This indicates that limits to arbitrage contribute to the persistence of overreaction to leaders' news.

6 | ALTERNATIVE EXPLANATIONS

While our explanation for the overreaction is based on investors' limited attention and overconfidence, which assume irrational investor behaviour, it is essential to evaluate this explanation against other potential rationales that do not presume investor irrationality. In the following session, we investigate alternative well-documented factors that may explain the market anomaly.

6.1 | Does the risk explain the overreaction?

The possibility that the risk explains the overreaction observed in the study could be mitigated by the proper application of risk measures (Thomas & Zhang, 2008). In our study, the CAPM is applied when calculating abnormal returns. Considering the short-term timeframe over which we measure risk, our results may be explained by the extremely high risk. However, according to Fama (1998), the expected return over short-term intervals tends to be negligible, regardless of the return prediction model employed. Furthermore, our results are robust to controls representing common risk factors such as firm size, book-to-market ratio and price momentum. It is unlikely that overreaction results from a mismeasured risk since it requires a large risk shifting (Thomas & Zhang, 2008).

6.2 | Do the fundamentals explain the overreaction?

In the hedged portfolio analysis (Table 5), we account for firm-specific fundamentals. The results show that the return differences between the highest and lowest quintiles are economically substantial and cannot solely be attributed to individual firm characteristics like size or book-to-market ratio. These factors, while capable of explaining variations in returns, do not seem to account for the observed overreaction phenomenon. Therefore, it is unlikely that the overreaction effect is driven by differences in firm-specific fundamentals.

6.3 | Does the shared analyst coverage explain the overreaction?

The presence of shared analysts among leader and peer firms may lead to information spillover and overreaction (Ali & Hirshleifer, 2020). To examine whether the overreaction is merely due to shared analyst coverage, we re-estimate the overreaction model excluding pairs of leader and peer firms that share common analyst coverage. Table 12 shows a negative association between *CAR_peer* and *CAR_peer_own*, excluding the above possibility. In contrast, the coefficient of *CAR_peer* ($\beta = -0.3457$) is greater in magnitude compared to the full sample in Table 3 ($\beta = -0.1798$). This implies that instead of increasing overreaction to leaders' news, shared analyst coverage tends to alleviate overreaction, possibly through shared information among institutional investors and alleviating their overreaction as they are the main clients of analyst research in China. This inference also complements our prior finding that retail investors' excessive attention contributes to the overreaction to leaders' EAs (Table 7 and Panel E of Table 9).

7 | FURTHER ANALYSES

7.1 | What if peers announce their EAs within 1 month before leaders? (Figure 2)

This section extends our investigation to test whether the EAs of peer firms, made within a month prior to those of the industry leaders, alleviate any overreaction by investors. The first and second peer EAs are for quarter q and quarter $q+1$, respectively. Table 13 shows that there is no significant overreaction (Columns 3 and 4) but an information spillover (Columns 1 and 2), indicating that investors react rationally in this scenario. This pattern may occur because peers' stock prices already incorporate relevant information about peer firms by the time they announce their earnings, which could assist investors in assessing any subsequent information from leaders' EAs, thus preventing overreaction. This finding is consistent with previous

TABLE 12 Test of shared analyst coverage.

DV = *CAR_peer_own*	(1)	(2)
CAR_peer	−0.2428**	−0.3457***
	(−2.0092)	(−3.0353)
LSIZE	0.3247	2.3151***
	(1.0539)	(6.2382)
BM	0.2128	−0.7671***
	(0.9020)	(−2.7475)
Vol		0.7184***
		(4.8668)
Mom		−1.1713**
		(−2.5529)
Lnfirmnews		−2.4554***
		(−6.7497)
Constant	−9.3019	−55.7274***
	(−1.3572)	(−6.6709)
Observations	7085	7085
Year FE	Y	Y
Industry FE	Y	Y
R^2	0.032	0.116

Note: This table presents regressions of *CAR_peer_own* on *CAR_peer* as specified in regression (3) by excluding the firms with shared analyst coverage. Controls include firm size (*LSIZE*), book-to-market ratio (*BM*), peer firm news (*Lnfirmnews*), annual return momentum (*Mom*) and monthly return volatility (*Vol*). See Appendix S1 for variable definitions. Robust standard errors clustered at the firm levels are used to compute the *t*-statistics in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

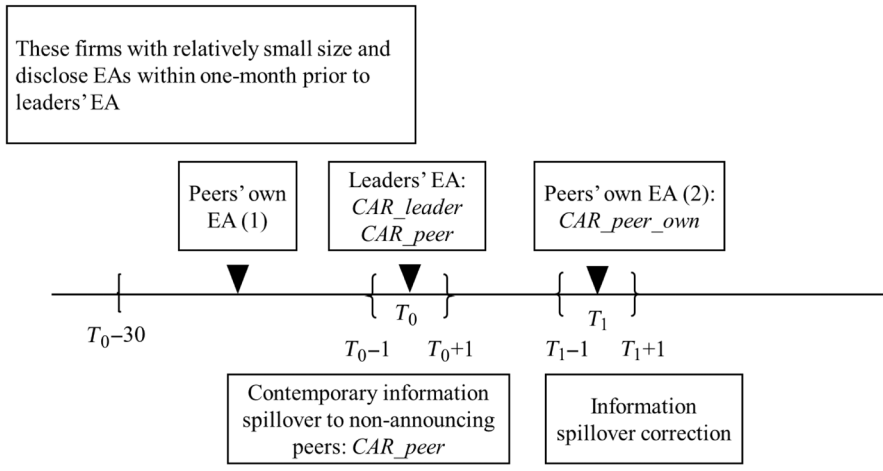

FIGURE 2 What if peers announce its EAs within 1 month prior to leaders? This figure illustrates the peers disclose EAs within 1 month prior to the industry leaders' EA. *CAR_leader* is CAR of leaders around the 3-day window centred on leaders' EA. *CAR_peer* is CAR of peers around the 3-day window centred on leaders' EA. *CAR_peer_own* is CAR of peers around the 3-day window centred on their own EAs. We examine the information transfer over $[t_0-1, t_0+1]$ and information spillover reversal over $[t_1-1, t_1+1]$.

TABLE 13 Further analysis: What if peers announce its EAs within 1 month prior to leaders?

	(1)	(2)	(3)	(4)
	CAR_peer	CAR_peer	CAR_peer_own	CAR_peer_own
CAR_leader	0.0690***	0.0554***		
	(9.1768)	(4.0123)		
CAR_peer			−0.0035	−0.0064
			(−0.6863)	(−0.9226)
LSIZE	0.1266	0.2145	−0.4629**	−0.3480*
	(0.6692)	(1.3603)	(−2.6187)	(−1.8667)
BM	−0.6883***	−0.4791***	−0.1817	−0.2139
	(−4.2716)	(−5.4466)	(−0.8204)	(−0.9983)
Vol		0.5248**		0.0508
		(2.6849)		(1.8004)
Mom		1.1514***		0.0129
		(5.5921)		(0.5490)
Lnfirmnews		0.0914		−0.2113
		(1.0194)		(−1.3761)
Constant	−1.6333	−6.1349*	13.4324***	11.5431**
	(−0.3882)	(−1.9794)	(3.5102)	(2.9265)
Observations	6580	6580	6580	6580
R^2	0.051	0.255	0.050	0.051
Year FE	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y

Note: Columns 1 and 2 present regressions of *CAR_peer* on *CAR_leader* as specified in regression (2) by using the peer firms with EAs within 1 month prior to leaders' EAs. Columns 3 and 4 present regressions of *CAR_peer_own* on *CAR_peer* as specified in regression (3) by using the peer firms with EAs within 1 month prior to leaders' EAs. Controls include firm size (*LSIZE*), book-to-market ratio (*BM*), peer firm news (*Lnfirmnews*), annual return momentum (*Mom*) and monthly return volatility (*Vol*). Robust standard errors clustered at the firm levels are used to compute the t-statistics in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

research, such as that of Hou (2007), which documents the lead–lag effect observed in the Chinese stock market, thus indicating an information spillover.

7.2 | Market reaction to leaders of different sizes

In this study, we identify industry leaders as the top three firms within the industry ranked by market capitalization. The reason to include the top three firms is that in some industries, the size of the second-largest and third-largest firms are very close to the largest firms. However, in other industries, the largest firm could be far larger than the second and third ones. Therefore, we further test information spillover (Regression 2) and overreaction (Regression 3) using alternative definitions of leaders.

Untabulated results show that when we define industry leaders as the largest firms within the industry, we observe both information spillover and overreaction. However, when we define industry leaders as the second and third-largest firms (without the largest ones), we only observe information spillover but no overreaction. This is also consistent with our limited attention and overconfidence explanation. Based on official data from the Shanghai and Shenzhen stock

exchanges, retail investors account for over 80% of the trading volume, a stark contrast to the US market where they represent <20%. Consequently, the larger firms tend to capture the attention of these predominantly less sophisticated retail investors. This often leads to an overemphasis on the information conveyed by these larger firms' EAs when evaluating the performance of their peers. While our study focuses on leader firms, one test beyond the scope of this study but is worthwhile conducting in future research is to examine whether the information spillover exists from smaller-size peers (non-leaders) to other peers and whether there is any overreaction or underreaction.

8 | CONCLUSION

Building on the existing literature, this study explores how industry leaders' earnings news impacts their peers in the Chinese stock market. We find that consistent with Arif and De George (2020) which examines the information transfer in the US market, information from industry leaders does spill over to peers, but the excessive spillover is reversed when peers subsequently announce their own earnings. The overreaction applies to all non-leader firms in China rather than low-frequency reporters in the United States (Arif & De George, 2020).

Unlike prior studies, our study goes beyond merely identifying the occurrence of overreactions. We provide a deeper analysis of the underlying mechanisms and explain the phenomena in more detail. First, we confirmed that investors outweigh the leaders' earnings in estimating the peers' earnings by identifying a negative relationship between *CAR_peer* and *SUE_peer*. Second, the portfolio analysis shows that the reversal magnitude (*CAR_peer_own*) exceeds the information spillover (*CAR_peer*), suggesting the possibility that investors overestimate industry-level information conveyed in leaders' EAs which is positively related to peers' earnings, but underestimate competition-related information conveyed in leaders' EAs which is negatively related to peers' earnings.

A novel aspect of our analysis is the differentiation between buying and selling volumes, shedding light on the trading behaviour of new and existing shareholders. Additionally, we find that retail investors' trading behaviours during leaders' EAs significantly contribute to the overreaction, aligning with theories of limited attention bias. The overreaction phenomenon is predominantly observed with the largest industry leaders, lending further support to the limited attention hypothesis.

Cross-sectional tests reveal that this overreaction is more pronounced in companies with larger analyst forecast dispersion and high stock price synchronicity. This finding is consistent with prior studies demonstrating that investor overreaction is more pronounced when assessing focal companies with poor information environment. Furthermore, the study finds that shared analyst coverage could alleviate the overreaction, possibly by facilitating institutional investors to better incorporate leaders' information through analyst research.

Based on our analysis, the spillover effect in the Chinese stock market is likely to be stronger than in the United States. In the Chinese setting, we find that overreaction is primarily driven by retail investors and is more pronounced for firms operating in poor information environments and under conditions of limited arbitrage. If these findings are generalizable across countries, the Chinese stock market, characterized by a high proportion of retail investors and less developed market mechanisms (including limited access to firm-specific information and significant arbitrage constraints), is expected to exhibit stronger overreactions to leaders' news compared to the US market. To be noted, while our findings in China and the US findings suggest a moderating effect of poor information environments and limits to arbitrage on overreactions (Arif & De George, 2020; Thomas & Zhang, 2008), this might not fully account for other market-specific factors such as regulatory frameworks, investor behaviour, etc. Further research can conduct international study to directly compare the overreaction.

In summary, this study provides new insights of information spillover and overreaction to industry leaders' news in financial markets, specifically within the Chinese context.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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