



# Diamond cuts diamond: News co-mention momentum spillover prevails in China

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## ABSTRACT

We conduct a comprehensive study on momentum spillovers in the Chinese stock market using various types of economic linkages, with particular attention to momentum spillover via news co-mention linkages. We utilize millions of Chinese business news articles and develop a flexible and innovative algorithm to identify linkages among listed firms. We find that news co-mention momentum spillover is stronger than others, unifying various forms of momentum spillover effects in the Chinese market and replacing the role of analyst co-coverage in the U.S. News co-mention identifies a wide range of economically important linkages, particularly recovering more cross-industry linkages than other link identification methods, which contributes to its strong performance.

## 1. Introduction

In the past decade, a new momentum-like anomaly known as “momentum spillovers” or “cross-firm momentum” has raised a lot of attention in the U.S. stock market. Due to investors’ limited attention, a focal firm’s stock price responds sluggishly to new information about economically linked firms. As a result, the past returns of linked firms predict the future return of the focal firm. The literature documents the existence of such momentum spillover effect via various types of economic linkages, including industry links (Moskowitz and Grinblatt, 1999; Hou, 2007), customer–supply links (Cohen and Frazzini, 2008), geographic links (Parsons et al., 2020; Jin and Li, 2020), technology links (Lee et al., 2019; Duan et al., 2022), news-implied links (Scherbina and Schlusche, 2013), concept links (Du et al., 2022b), and analyst co-coverage links (Ali and Hirshleifer, 2020), etc. Besides, in the US market, the cross-firm momentum via analyst co-coverage unifies the “zoo” of other momentum spillover effects (Ali and Hirshleifer, 2020).

The Chinese stock market has experienced rapid development over the past 20 years. Up to 2022, there are over 4700 A shares, with a total market value exceeding 90 trillion yuan (approximately 15 trillion dollars). As the second-largest stock market globally, anomaly studies have garnered considerable attention from investors and researchers

worldwide. Although numerous studies have replicated various anomalies within the Chinese market, the exploration of cross-firm momentum (or momentum spillovers) remains limited.

Most literature on cross-firm momentum attributes this cross-stock lead–lag effect primarily to limited attention and slow information diffusion (e.g., Cohen and Frazzini, 2008, Ali and Hirshleifer, 2020, Lee et al., 2019, and Eisendorfer et al., 2022). The Chinese stock market has unique characteristics that make it an intriguing setting for studying cross-firm momentum. The market is dominated by retail investors who generally have lower sophistication and face higher costs in gathering and processing information (Bailey et al., 2009), often leading them to overlook signals from economically linked firms in their trading decisions, thereby creating a pronounced lead–lag effect among linked firms. Another significant feature is the market’s high turnover rate (Pan et al., 2016). While this high turnover suggests active trading, it is largely driven by speculative noise trading from retail investors, which does not necessarily correspond to efficient information processing.<sup>1</sup> Thirdly, the market includes many state-owned enterprises (SOEs) that navigate both economic and political objectives (Bai et al., 2006). These characteristics raise questions about the presence and nature of momentum spillover effects in the Chinese market.

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<sup>1</sup> Han and Zhang (2024) documented that anomaly returns increase during periods of high trading activity, which they attribute to noise trading. In addition, Jones et al. (2020) leveraged account-level data and showed that high turnover in the Chinese market often reflects excessive but uninformative trading behavior, supporting the idea that high turnover and speculative trading can coexist with systematic under-reaction.

In this paper, we conduct a comprehensive study on momentum spillovers in the Chinese stock market using various types of economic linkages, with particular attention to momentum spillover via news co-mention linkages. We utilize millions of Chinese business news articles and develop a flexible and innovative algorithm to identify linkages among listed firms. We find that the momentum spillover effect among firms linked through news co-mentioning (referred to as the news co-mention momentum spillover) is significantly stronger than others, including the momentum spillover driven by shared-analyst linkages, which [Ali and Hirshleifer \(2020\)](#) documented as exhibiting the strongest predictive power and unifying all momentum spillover effects in the U.S. stock market. Furthermore, using spanning tests and [Fama and MacBeth \(1973\)](#) regressions, we show that all forms of cross-firm momentum effects can be unified by the news co-mention momentum spillover in the Chinese stock market. Notably, the analyst co-coverage momentum spillover effect, dominant in the U.S. stock market, is subsumed by the news co-mention momentum spillover effect in the Chinese stock market.<sup>2</sup> We further explore the differences in the information content of links implied by news co-mentioning and other proxies. Using the Naïve Bayes algorithm to classify news into different topics, we find that news co-mention identifies a wide range of economically important linkages, and the strong performance of the news co-mention momentum effect is a composite reflection of all types of news. We also find that news co-mention identifies more cross-industry linkages than other link identification methods. The comprehensive and rich information contained in news co-mention linkages could contribute to the strong performance of news co-mention momentum spillover.

We leverage millions of news articles from the Financial Text Database of the Financial Engineering Laboratory at Peking University, spanning from 2006 to 2020. To construct news co-mention linkages, we adopt two strategies. The first follows [Scherbina and Schlusche \(2013\)](#) and [Ge et al. \(2022\)](#), which define two firms as linked if they are co-mentioned in the same news article during a pre-specified identification window. This identification strategy is referred to as *same\_article*. One potential issue with this strategy is that two firms that happen to appear in the same article may be mentioned in different sentences and are actually unrelated. Addressing this concern, our second identification strategy, denoted as *same\_sentence*, defines two firms as linked if they are co-mentioned in the same sentence of a news article during a pre-specified identification window.<sup>3</sup> To better understand the information content of news co-mentions, we classify news into different categories so that each identified link can be labeled according to its news category. Using a labeled news sample, we first train a Naïve Bayes model and then apply this trained model to classify all our sample news.<sup>4</sup> For the main body of the paper, we use the aggregated news sample to construct trading signals and factors. In the further analysis section, we delve deeper to investigate the label-specific news co-mention momentum spillover effect.

With the identified news co-mention linkages, we proceed to test the presence of the news co-mention momentum spillover effect. Given the fast-trading nature of the Chinese stock market, many anomalies that typically persist at a monthly frequency in the U.S. are observable

only at a weekly or even daily frequency in China.<sup>5</sup> Consequently, we primarily focus on momentum spillovers at the weekly frequency. At the end of each week, we construct a signal for each stock based on the weighted average returns of its linked stocks. We sort stocks into quintiles, and construct a long-short strategy, which involves purchasing stocks from the top quintile while shorting stocks from the bottom quintile. We construct eight such long-short trading strategies using combinations of the two identification strategies and four identification windows (including window lengths of 3, 6, 9, and 12 months),<sup>6</sup> and these trading strategies, based on news co-mention momentum spillover, all generate significant and positive abnormal returns. For instance, adopting the *same\_sentence* identification strategy with a 3-month identification window, the long-short return is 1.94% (t-statistic = 5.33), and the corresponding ([Liu et al., 2019](#)) four-factor (referred to as CH-4 hereafter) adjusted alpha is 1.86% (t-statistic = 5.23).<sup>7</sup> Moreover, we find that the *same\_sentence* strategy outperforms the *same\_article* strategy, as the former yields larger abnormal returns with the same identification window. This finding aligns with our expectation that the *same\_sentence* strategy is more effective in identifying genuine links among firms. Another interesting observation is that the strength of news co-mention momentum spillover decreases steadily as the length of the identification window increases. This can be attributed to the fast updating of news, which renders stale information less useful in identifying relevant linkages.

We then compare the strength of news co-mention momentum spillover with various other momentum spillover effects studied in the existing literature. The seven other cross-firm momentum effects we examine include shared-analyst momentum, industry momentum, geographic momentum at the province and city levels, customer-supplier momentum, technology momentum, statistical momentum, and concept momentum. Similar to the previous case, for each linkage type, we construct signals for each stock based on the weighted average returns of its linked stocks and sort all stocks into quintiles. The long-short strategies exploiting most of these cross-firm momentum effects also yield positive and statistically significant abnormal returns. However, these returns are noticeably smaller in both economic and statistical terms compared to those obtained using news co-mentioning. Apart from the CH-4 model, we also consider the FF-3, FF-5, Carhart-4, and DHS-3 models for risk adjustments, and the results remain robust.

Given that the news co-mention momentum spillover effect is significantly stronger than others, we follow [Ali and Hirshleifer \(2020\)](#) in using spanning tests and [Fama and MacBeth \(1973\)](#) regressions to investigate whether the news co-mention momentum spillover encompasses and unifies the various other momentum spillover effects observed in the Chinese stock market. To conduct the spanning tests, we construct long-short factor returns based on news co-mentioning and the other six types of linkages discussed earlier.<sup>8</sup> Considering the superior performance of the *same\_sentence* identification strategy, we focus on this strategy for constructing the news co-mention momentum spillover factor. We construct four news co-mention momentum

<sup>2</sup> The fact that the analyst co-coverage momentum spillover effect is not as strong in the Chinese stock market as in the U.S. stock market is unsurprising. Most Chinese analysts specialize in specific industries, leading to significant overlaps with industry-specific information. Conversely, the news co-mention linkage encompasses a wide range of economic linkages, surpassing mere within-industry information.

<sup>3</sup> A similar link identification strategy is adopted in [Schwenkler and Zheng \(2019\)](#) and [Schwenkler and Zheng \(2021\)](#).

<sup>4</sup> A leading security company kindly provided us with thousands of labeled news samples. More details about this sample can be found in the Appendix. We manually checked over a thousand of these labeled news to ensure the classifications make economic sense.

<sup>5</sup> For instance, [Duan et al. \(2022\)](#) found that while technology momentum persists monthly in the U.S., it is only significant at the weekly level in China due to rapid retail trading. They also show that the predictability horizon is shorter for stocks with higher retail investor participation. [He et al. \(2021\)](#), when investigating a cross-stock momentum anomaly across markets, focused on weekly data for the Chinese stock market, arguing that “in countries with extremely high turnover, such as China, investors may pay more attention to past week’s returns rather than past month’s returns”. [Chen et al. \(2023\)](#) also used weekly data to analyze behavioral biases among Chinese stock investors.

<sup>6</sup> We set the shortest identification window to have a length of 3 months as shorter windows yield only a small number of firms with news links.

<sup>7</sup> These returns are monthly returns converted from weekly ones.

<sup>8</sup> Due to the low quality of disclosed data regarding top customers in China, we do not consider the customer-supplier momentum spillover factor, which is often used as the representative cross-firm momentum in the US (e.g., [Huang et al., 2021](#) and [Huang et al., 2022](#)).

spillover factors using identification windows of 3, 6, 9, and 12 months. For instance, we denote *Sentence\_3* as the news co-mention momentum spillover factor based on identifying linkages using a 3-month window with the *same\_sentence* strategy. Strikingly, the alphas of all other momentum spillover factors become insignificant, and some even turn negative when we add the news co-mention momentum spillover factor to the CH-4 factor model. For instance, the long-short strategy based on statistical momentum generates a CH-4 alpha of 1.34% (t-statistic = 3.35), ranking second in economic magnitude among all competitors. However, when we add the *Sentence\_3* factor, its CH-4+*Sentence\_3* model-adjusted alpha decreases drastically to 0.17% (t-statistic = 0.43). In contrast, none of the other six momentum factors can explain any of the four news co-mention momentum spillover factors (i.e., *Sentence\_3*, *Sentence\_6*, *Sentence\_9*, *Sentence\_12*). Additionally, among the four news co-mention momentum spillover factors, the factor constructed with a shorter identification window can explain the factors with longer identification windows, but not vice versa. The factor-spanning tests demonstrate that all forms of cross-firm momentum effects can be unified by the news co-mention momentum spillover in the Chinese stock market. This conclusion remains robust when we use different factor models, industry classifications, and news co-mention types. Fama–MacBeth regressions further support this conclusion. Based on both union and intersection samples, after incorporating the news co-mention peer firm returns as an explanatory variable, the variables based on other cross-firm momentum effects become insignificant in predicting future returns.

We then explore the differences in the information content of links implied by news co-mentioning and other proxies. Scherbina and Schlusche (2013) and Schwenkler and Zheng (2019) find that news co-mentioning reveals a wide range of economic linkages among companies, including those within the same industry, business alliances, partnerships, banking and financing, customer–supplier relationships, production similarity, etc. Our topic classification exercise already shows that news co-mention identifies a wide range of economically important linkages, and the strong performance of the news co-mention momentum effect is a composite reflection of all types of news. Additionally, we examine the distribution of within- and cross-industry information from news linkages. Firstly, we find that the degree of overlap with industry information is relatively low for the news co-mention linkage compared to other types of linkages. Conversely, the shared-analyst linkage shows the highest degree of overlap with industry linkage. We further decompose linked firms into industry peers and cross-industry peers and then examine the two corresponding momentum spillover effects separately. We find that for news co-mentioning, the long-short portfolio based on within-industry and cross-industry momentum spillovers generates very similar returns and CH-4 adjusted alphas. In contrast, for other linkage types, the within-industry momentum spillover is noticeably stronger. For example, in the case of geographic and technology linkages, only the long-short portfolio based on the within-industry momentum spillover effect generates a positive and statistically significant alpha. The cross-industry momentum spillover effect does not yield significant abnormal returns. In the case of analyst co-coverage links, although its cross-industry momentum generates a positive alpha, it is marginally significant and only half the size of that obtained from within-industry momentum. This exercise provides evidence that news co-mentioning reveals a wider range of economic links, and news-implied linkages are more comprehensive compared to other types of linkage proxies. Specifically, news co-mentioning incorporates both industry information and valuable non-industry linkage information, which contributes to its strong predictive power for future returns.

In addition to containing comprehensive information, another advantage of news is its prompt updates, which help us to identify changes in linkages among firms in a timely manner. We track the percentage change in various linkage networks over time and find that the news-implied network updates faster than other networks. Each week, some

links are added to the network, and some stale links are removed. Due to these rapid updates, it is more challenging for investors to gather and process this information, which might explain why news co-mention momentum spillover is stronger, particularly with shorter identification windows. In contrast, other networks are more persistent, making it relatively easier for investors to consider this information when making decisions.

After confirming that news co-mention momentum spillover unifies various momentum spillover effects and highlighting the advantages of news in identifying linkages, we further investigate the mechanism behind this news-based momentum spillover. We find that news co-mention momentum is weaker among firms with higher analyst coverage, more analyst reports, larger float values, higher institutional holder proportions, lower opacity, more internet search, and less linkage complexity. These findings support the limited attention explanation of news co-mention momentum.<sup>9</sup> Recent work by Huang et al. (2021) proposed a new behavioral explanation for the cross-firm momentum anomaly, suggesting that investors are slow to react to good news when the stock price is near its 52-week high and slow to react to bad news when the stock price is far from its 52-week high due to the anchoring effect. However, our empirical analysis does not support this explanation, possibly because the 52-week high effect itself is not empirically supported in the Chinese stock market (Zhang et al., 2019; Hou et al., 2023).

We conduct a battery of heterogeneity analyses and robustness checks. In China, state-owned enterprises (SOEs) play a critical role in shaping market dynamics and contributing to the overall economy. We perform separate portfolio analyses for SOEs and non-SOEs, and interestingly, we find that the news co-mention momentum spillover is stronger for non-SOEs than for SOEs. This observed difference could be due to media bias. Given that SOEs in China are politically connected, it is plausible that news co-mentioning about SOEs may be less precise in capturing peer firm relationships compared to non-SOEs. Then, we investigate the impact of news sentiment on the news co-mention momentum effect. We adopt the methodology described in Jiang et al. (2019) and assign each news article a positive or negative sentiment label. We find that news co-mention momentum is robust to sentiment; using either positive or negative news alone yields significantly positive returns and alphas. Notably, positive news corresponds to stronger anomaly returns, consistent with the results from Stambaugh et al. (2012), who documented that anomalies are generally stronger following high levels of sentiment. Using a set of firm-level characteristics, we find that the news co-mention momentum is significantly stronger among firms with lower market capitalization, shorter establishment ages, and lower turnover rates. This finding further supports the theories of limited attention and slow information diffusion.

In the robustness part, we first take transaction cost and shell effect into consideration. Following Fan et al. (2021), we consider a transaction cost of 16 bps for each trade (buying and selling combined). The long-short portfolio constructed based on news co-mention momentum generates a mean return of 1.29% (t-statistic = 3.56), and the CH-4 adjusted alpha is 1.21% (t-statistic = 3.42). In contrast, after taking transaction cost into consideration, trading strategies based on other cross-firm momentum effects all have insignificant alphas. This suggests that the news co-mention momentum strategy remains robust and profitable even when considering real-world transaction costs while others are not. To eliminate the potential shell effect in

<sup>9</sup> Most previous studies attribute the momentum spillover effect to investors' limited attention to news from peer firms. See Burt and Hrdlicka (2021) for a detailed list of these studies. If this limited attention theory explains the news co-mention momentum in China, we would expect to see a weaker momentum spillover effect when information from peer firms is more transparent and easier to access.

the Chinese stock market, we follow [Liu et al. \(2019\)](#) to drop firms with sizes at the bottom 30% of the market. Our key results remain unchanged. We then carefully examine the relationship between our news co-mention momentum and the traditional cross-sectional momentum effect ([Jegadeesh and Titman, 1993](#)). Utilizing exclusion tests, correlation analysis, and double sorting analysis, we confirm that news co-mention momentum is distinct from standard cross-sectional momentum. Finally, we demonstrate that the established unifying effect is robust across alternative factor models, industry classifications, sample periods, link identification strategies, and weighting schemes.

This paper contributes to three strands of literature. First, it provides new evidence on cross-firm momentum. Previous literature focuses on testing the cross-firm momentum driven by different linkages in the US stock market (e.g., industry connection ([Moskowitz and Grinblatt, 1999](#); [Hou, 2007](#)), supply chain ([Cohen and Frazzini, 2008](#); [Menzly and Ozbas, 2010](#); [Gengay et al., 2015](#)), conglomerate-standalone linkage ([Cohen and Lou, 2012](#)), alliance partnership ([Cao et al., 2016](#)), annual report similarity ([Hoberg and Phillips, 2018](#)), technology similarity ([Lee et al., 2019](#)), geographic proximity ([Parsons et al., 2020](#); [Jin and Li, 2020](#)), analyst co-coverage ([Ali and Hirshleifer, 2020](#)), competition relationship ([Eisdorfer et al., 2022](#)), etc.). In this paper, we conduct a comprehensive study of momentum spillovers in the Chinese stock market using various types of economic linkages. It sheds light on the interplay between different linkages and their effects on stock returns, providing valuable insights for investors and researchers interested in cross-momentum strategies in emerging markets.

Second, this paper contributes to the growing literature on empirical asset pricing and anomalies in the Chinese stock market. As the second-largest stock market after the U.S., the anomaly study of China's stock market has been attracting growing attention. For example, [Jiang et al. \(2018\)](#) test the predictability of 75 individual firm characteristics. [Hou et al. \(2023\)](#) and [Li et al. \(2023\)](#) both replicate more than 400 anomalies similar to those found by [Hou et al. \(2020\)](#) using Chinese stock data. [Leippold et al. \(2022\)](#) use machine learning tools to examine the predictive power of 94 characteristics. However, few studies have looked into cross-firm predictability in China. The distinctive features, including the predominance of retail investors and high turnover rates, make the information processing patterns different from the U.S. stock market and raise questions about the presence and nature of momentum spillover effects in the Chinese market. In this paper, we examine the momentum spillover effect driven by various forms of economic linkages. We find that, unlike the standard cross-sectional momentum effect, which fails in China ([Liu et al., 2019](#)), the momentum spillover effect driven by most economic linkages exists in the Chinese stock market. In particular, news co-mention momentum spillover is the dominant species in the “zoo” of momentum spillovers. This unique finding enriches the stock anomaly literature concerning China's stock market.

Third, this paper also relates to the literature that extracts soft information from textual data. In recent years, there has been an explosion of empirical research in economics and finance utilizing text as data. For instance, [Ke et al. \(2019\)](#) uses information from news articles to predict asset returns, [Hu et al. \(2021\)](#) extracts information from Reddit to study the impact of social media on market dynamics, and [Cong et al. \(2019\)](#) develops a framework to generate “textual factors” from large text datasets. News data has received significant attention among various alternative data sources, and there is a growing interest in using news coverage to identify linkages among firms. Studies such as [Scherbina and Schlusche \(2013\)](#) have demonstrated the usefulness of firm linkages identified through news co-mentioning in predicting stock returns. Additionally, [Schwenkler and Zheng \(2019\)](#) have developed a machine-learning method to construct a news-implied network of firms, applying the same identification strategy to establish crypto peers ([Schwenkler and Zheng, 2021](#)). [Guo et al. \(2017\)](#) have explored the association between news co-mentioning and investor attention spillovers. This paper adopts two different identification strategies to infer firm linkages from news and shows that the sentence

co-mentioning strategy is more effective in identifying genuine links among firms. Unlike the findings of [Scherbina and Schlusche \(2013\)](#), who use article co-mentioning to identify linkages and found that trading strategies based on the predictability of linked firms' past returns may not be profitable when considering transaction costs, we demonstrate that our strategy, based on sentence co-mentioning to infer links, remains robust and profitable even when accounting for real-world transaction costs.

The rest of the paper is organized as follows. In Section 2, we introduce the data and the construction of different linkages. Section 3 presents the portfolio analysis for each type of momentum spillover effect. In Section 4, we examine the unifying effect of the news co-mention momentum spillover and explore the differences in the information content of links implied by news co-mentioning and other proxies. Section 5 investigates the mechanism underlying the news co-mention momentum. Section 6 includes further analysis and robustness checks. Section 7 concludes. Additional materials are provided in the Appendix.

## 2. Data and summary statistics

The sample stocks used in this paper include all A-shares listed on the main boards of the Shanghai Stock Exchange (SSE), Shenzhen Stock Exchange (SZSE), and the Growth Enterprise Market (GEM). Special treatment (ST) shares are excluded.<sup>10</sup> In the robustness analysis, we also exclude firms that have the bottom 30% capitalization from the sample. This is done to prevent potential biases related to the shell effect in the Chinese stock market, as highlighted in the study by [Liu et al. \(2019\)](#). The full sample period for our analysis spans from 2006 to 2020. Due to data availability issues specific to each linkage type, the sample periods may vary and be shorter when conducting analysis for different types of linkages. Stock trading data, financial statements, and risk-free interest rates (one-year deposit rate) are from CSMAR. The CH-4 factor data is obtained from Robert F. Stambaugh's website.<sup>11</sup> The factor data of [Fama and French \(1993\)](#) 3-factor model and [Fama and French \(2015\)](#) 5-factor model are provided by CSMAR. The data of the [Carhart \(1997\)](#) 4-factor model and [Daniel et al. \(2020\)](#) 3-factor model are collected from BetaPlus.<sup>12</sup>

In later subsections, we provide details on the data sources and construction methodology for each type of economic linkage considered in the study, as well as the corresponding predictive signals derived from these linkages. We first discuss the news co-mention links, which are our main focus. Then, we provide brief descriptions of seven other proxies for inter-firm linkages commonly studied in the literature, including the analyst co-coverage ([Ali and Hirshleifer, 2020](#)), customer-supplier relationship ([Cohen and Frazzini, 2008](#)), industry classification ([Hou, 2007](#)), geographic proximity ([Parsons et al., 2020](#)), technology affinity ([Lee et al., 2019](#)), statistical similarity of firm features ([He et al., 2021](#)), and concept category ([Du et al., 2022b](#)).

### 2.1. News co-mention linkages

We use millions of news articles from the Financial Text Database of Financial Engineering Laboratory at Peking University starting from

<sup>10</sup> Since April 22, 1998, the Shanghai and Shenzhen stock exchanges have implemented Special Treatment (ST) for the stock trading of listed firms with abnormal financial conditions. ST shares are prefixed with “ST” and are considered to have extremely high risk. Therefore, they are often excluded from research about the Chinese stock market.

<sup>11</sup> The website provides monthly and daily CH-4 factor data. We construct weekly factors by using cumulative daily factor returns in one week (i.e., at the end of each trading week, the weekly CH-4 factor is the cumulative return of daily CH-4 factor returns from the first trading day to the last trading day of the week).

<sup>12</sup> See: <https://www.factorwar.com/data/factor-models/>.

**Table 1**  
Label names of news topics.

|          | Chinese names | English names                         |
|----------|---------------|---------------------------------------|
| Label 1  | 分红送转          | Dividend distribution and bonus issue |
| Label 2  | 荣誉            | Honors                                |
| Label 3  | 财务状况          | Financial conditions                  |
| Label 4  | 项目动态          | Projects dynamics                     |
| Label 5  | 大宗交易          | Block trade                           |
| Label 6  | 法律诉讼          | Legal litigation                      |
| Label 7  | 公司动态          | Company dynamics                      |
| Label 8  | 股份变动          | Share changing                        |
| Label 9  | 关联企业出现问题      | Problems of connected enterprises     |
| Label 10 | 经营状况          | Operating conditions                  |
| Label 11 | 再融资           | Re-financing                          |
| Label 12 | 战略合作          | Strategic cooperation                 |

This table shows the Chinese and English names of 12 categories of news used in the paper.

2006 to 2020.<sup>13</sup> We filtered out 1,138,247 news articles that mentioned at least one listed firm in the A market. Table A.1 from Appendix A presents a summary of the daily basic information of the news data since 2006. Prior to 2012, the news data were relatively sparse, with an average of fewer than 100 news pieces per day. The volume of news data has increased substantially since 2012. Given this, although the news data have been available since 2006, we use the subset from 2012 to 2020 in the main body of the paper, a period during which the quality of the news data is higher. For robustness checks, we also consider different sample periods.

To better understand the information content of news co-mention, we use machine learning tools for topic classification. We employ supervised learning for this task.<sup>14</sup> A leading securities company in China provided us with thousands of already classified news articles, and the names of the news topics are shown in Table 1. We manually checked over a thousand of these classified articles to ensure that the classifications made economic sense. We divided all classified news into a training set and a test set. We trained the Naïve Bayes algorithm on the training set to optimize parameters and then tested the model on the test set. Our out-of-sample accuracy reached 70%.<sup>15</sup> Finally, we applied the trained model to all sample news in the paper to classify each piece into a specific topic. We have visualized the distributions of news co-mentions from 2012 to 2020 among the 12 classifications in Fig. 3 in the appendix. Label 3, Financial Conditions, has the largest proportion, accounting for 16.497% of the total news. Label 5, Block Trading, accounts for the smallest share of news co-mentions, accounting for just 2.321% of the total news.

We adopt two strategies to construct the news co-mention linkages. The first identification strategy is referred to as *same\_article*, which defines two firms as linked if they are co-mentioned in the same piece of news article during a pre-specified identification window. One potential issue with this identification strategy is that two firms that happen to appear in the same article may appear in different sentences and are actually unrelated to each other. Given this concern, the second identification strategy we adopt is called *same\_sentence*, which defines two firms as linked if they are co-mentioned in the same sentence of the same piece of news article during a pre-specified identification window.

For both identification strategies, we consider identification windows of various lengths, including 3-, 6-, 9-, and 12-month. The identification window cannot be too short or too long in order to strike a balance between capturing an adequate amount of news co-mentions and the inclusion of very stale information. Short windows result in a small number of stocks with news links, while long windows include outdated news with limited predictability. At the end of each week, for a focal firm  $i$ , we calculate the news-based predictive signal as the average excess return of linked firms weighted by the number of co-mentions during the identification window.<sup>16</sup> To be precise, considering this baseline weighting scheme, we have eight news-based signals with different identification strategies and window lengths. For example, the signal constructed based on *same\_sentence* and 3-month window is denoted as *Sentence\_3\_Rtn*, and the corresponding trading strategy is referred to as *Sentence\_3*.

## 2.2. Other linkages

Next, we will describe the construction of other types of linkages in order to conduct a comprehensive study on momentum spillovers in the Chinese stock market. Summary statistics for different linkage types are presented in Table 2.

### 2.2.1. Analyst co-coverage linkages

The analyst reports data used in our study are from the Chinese Research Data Services Platform (CNRDS). This platform functions similarly to Wharton Research Data Services (WRDS) and provides access to a wide range of Chinese research data in the fields of finance and economics. The sample period for our study is from January 2005 to December 2020, which covers the earliest available analyst prediction data on the CNRDS platform. There is a total of 1,478,413 pieces of analyst predictions over the sample period. After removing data with null values and eliminating duplicates based on analyst codes, report dates, and stock codes, we are left with 530,696 unique pieces of analyst prediction data for the identification of shared-analyst linkage.

We adopt the approach outlined by Ali and Hirshleifer (2020) to identify shared-analyst linkages and compute the shared-analyst peer firm return, denoted as *Analyst\_Rtn*. At the end of each trading week,

<sup>13</sup> See: <https://finlab.pku.edu.cn>.

<sup>14</sup> We thank an anonymous referee for suggesting this.

<sup>15</sup> The accuracy rate is the ratio of sample news correctly classified by the classification model to the total number of sample news. Specifically,  $Accuracy = \frac{TP+TN}{(TP+TN+FP+FN)}$ , where  $TP$  is the number of true positive sample news,  $TN$  is the number of true negative sample news,  $FP$  is the number of false positive sample news, and  $FN$  is the number of false negative sample news.

<sup>16</sup> We have also considered two alternative weighting schemes following suggestions from two anonymous referees. The first scheme uses firms' float size as the weight when computing the signal, meaning the news-based predictive signal is the average excess return of linked firms, weighted by the firm float size. The second strategy calculates weights based on the proximity of firm mentions within articles, which we refer to as the *same\_sentence\_dist* strategy. Specifically, the weight is determined by the inverse ratio of words between their mentions to the total words in the article.

**Table 2**  
Summary statistics.

| Link type   | Variables        | Count     | Mean   | Std.   | Min.    | Median | Max.    |
|-------------|------------------|-----------|--------|--------|---------|--------|---------|
| Sentence_3  | # Stocks         | 464       | 1100   | 280    | 715     | 996    | 1840    |
|             | # Peer firms     | 510 429   | 9      | 16     | 1       | 3      | 235     |
|             | Value            | 510 429   | 22.45  | 71.08  | 0.27    | 7.19   | 2509.88 |
|             | Peer firm return | 510 429   | 0.0050 | 0.0697 | −0.4101 | 0.0034 | 24.1232 |
| Sentence_6  | # Stocks         | 464       | 1515   | 231    | 1164    | 1462   | 2324    |
|             | # Peer firms     | 702 802   | 12     | 21     | 1       | 4      | 311     |
|             | Value            | 702 802   | 19.12  | 61.36  | 0.27    | 6.76   | 2509.88 |
|             | Peer firm return | 702 802   | 0.0044 | 0.0641 | −0.4102 | 0.0036 | 24.1232 |
| Sentence_9  | # Stocks         | 464       | 1758   | 187    | 1316    | 1756   | 2502    |
|             | # Peer firms     | 815 530   | 15     | 25     | 1       | 5      | 321     |
|             | Value            | 815 530   | 17.73  | 57.27  | 0.27    | 6.56   | 2509.88 |
|             | Peer firm return | 815 530   | 0.0038 | 0.0555 | −0.4101 | 0.0036 | 1.5622  |
| Sentence_12 | # Stocks         | 464       | 1925   | 199    | 1437    | 1915   | 2613    |
|             | # Peer firms     | 893 012   | 17     | 28     | 1       | 6      | 355     |
|             | Value            | 893 012   | 16.91  | 54.89  | 0.27    | 6.41   | 2509.88 |
|             | Peer firm return | 893 012   | 0.0034 | 0.0540 | −0.4103 | 0.0035 | 1.0741  |
| Article_3   | # Stocks         | 464       | 1332   | 293    | 903     | 1234   | 2223    |
|             | # Peer firms     | 618 272   | 16     | 32     | 1       | 5      | 454     |
|             | Value            | 618 272   | 20.41  | 65.11  | 0.27    | 6.96   | 2509.88 |
|             | Peer firm return | 618 272   | 0.0047 | 0.0559 | −0.4101 | 0.0043 | 3.3824  |
| Article_6   | # Stocks         | 464       | 1750   | 233    | 1355    | 1742   | 2704    |
|             | # Peer firms     | 812 053   | 23     | 42     | 1       | 8      | 631     |
|             | Value            | 812 053   | 17.79  | 57.39  | 0.27    | 6.58   | 2509.88 |
|             | Peer firm return | 812 053   | 0.0041 | 0.0526 | −0.4101 | 0.0044 | 0.8516  |
| Article_9   | # Stocks         | 464       | 1976   | 229    | 1478    | 1952   | 2816    |
|             | # Peer firms     | 917 064   | 29     | 51     | 1       | 10     | 757     |
|             | Value            | 917 064   | 16.69  | 54.22  | 0.27    | 6.38   | 2509.88 |
|             | Peer firm return | 917 064   | 0.0036 | 0.0507 | −0.4097 | 0.0042 | 1.0741  |
| Article_12  | # Stocks         | 464       | 2122   | 278    | 1569    | 2121   | 2891    |
|             | # Peer firms     | 984 555   | 35     | 59     | 1       | 12     | 867     |
|             | Value            | 984 555   | 16.06  | 52.43  | 0.27    | 6.24   | 2509.88 |
|             | Peer firm return | 984 555   | 0.0033 | 0.0493 | −0.4103 | 0.0041 | 1.0741  |
| Analyst     | # Stocks         | 768       | 1326   | 348    | 476     | 1429   | 1872    |
|             | # Peer firms     | 1 018 102 | 98     | 84     | 1       | 75     | 609     |
|             | Value            | 1 018 102 | 15.45  | 57.09  | 0.18    | 6.60   | 6285.82 |
|             | Peer firm return | 1 018 102 | 0.0032 | 0.0445 | −0.4099 | 0.0049 | 0.9588  |
| Customer    | # Stocks         | 566       | 109    | 56     | 24      | 71     | 197     |
|             | # Peer firms     | 61 428    | 1      | 0      | 1       | 1      | 5       |
|             | Value            | 61 428    | 8.37   | 20.68  | 0.08    | 4.53   | 517.98  |
|             | Peer firm return | 61 428    | 0.0025 | 0.0580 | −0.3662 | 0.0008 | 2.6103  |
| Industry    | # Stocks         | 768       | 2336   | 795    | 1048    | 2313   | 3893    |
|             | # Peer firms     | 1 794 095 | 130    | 83     | 2       | 110    | 364     |
|             | Value            | 1 794 095 | 13.85  | 59.28  | 0.11    | 4.88   | 6285.82 |
|             | Peer firm return | 1 794 095 | 0.0039 | 0.0463 | −0.2713 | 0.0058 | 0.5055  |
| Geographic  | # Stocks         | 768       | 2355   | 783    | 1088    | 2329   | 3892    |
|             | # Peer firms     | 1 808 617 | 201    | 162    | 3       | 157    | 651     |
|             | Value            | 1 808 617 | 13.84  | 59.05  | 0.09    | 4.88   | 6285.82 |
|             | Peer firm return | 1 808 617 | 0.0040 | 0.0445 | −0.2885 | 0.0063 | 1.0308  |
| Technology  | # Stocks         | 768       | 1020   | 513    | 318     | 954    | 2117    |
|             | # Peer firms     | 783 093   | 680    | 501    | 1       | 599    | 2109    |
|             | Value            | 783 093   | 17.99  | 82.98  | 0.08    | 5.27   | 6285.82 |
|             | Peer firm return | 783 093   | 0.0040 | 0.0437 | −0.3096 | 0.0064 | 0.9269  |
| Statistical | # Stocks         | 768       | 2015   | 704    | 988     | 2014   | 3548    |
|             | # Peer firms     | 1 547 320 | 263    | 79     | 115     | 240    | 390     |
|             | Value            | 1 547 320 | 14.19  | 56.96  | 0.09    | 5.03   | 2619.90 |
|             | Peer firm return | 1 547 320 | 0.0032 | 0.0453 | −0.2879 | 0.0052 | 0.2410  |
| Concept     | # Stocks         | 227       | 2970   | 497    | 2044    | 3028   | 3821    |
|             | # Peer firms     | 674 244   | 433    | 504    | 1       | 260    | 2704    |
|             | Value            | 674 244   | 17.14  | 60.78  | 0.48    | 6.21   | 2509.88 |
|             | Peer firm return | 674 244   | 0.0005 | 0.0340 | −0.1711 | 0.0006 | 0.6113  |

This table reports summary statistics. The sample stocks include all listed stocks on the main board of the Shanghai Stock Exchange, Shenzhen Stock Exchange, and Growth Enterprise Market (GEM). The news co-mention linkages are based on either *same\_sentence* or *same\_article* strategy, using identification windows of 3 months, 6 months, 9 months, and 12 months. The industry linkage is based on the Shenwan-1 classification. The geographic linkage is at the province level. The sample period of news co-mention momentum is 2012–2020. The sample period of customer–supplier momentum is 2010–2020. The sample period of concept momentum is Aug. 2016–2020. The sample periods for other momentums are 2006–2020.

two firms are defined as the shared-analyst peer firms if they are co-covered by the same analyst teams in the past 12 months.<sup>17</sup> At the end of each week, for a focal firm  $i$ , the shared-analyst peer firm return,  $Analyst\_Rtn_{it}$ , is the average excess return of analyst peer firms, weighted by the number of shared analyst teams. Since a one-year identification window is required to identify the shared-analyst linkages, the predictive signals can be computed from the beginning of 2006.

### 2.2.2. Industry linkages

There are three frequently used industry classification systems in China, namely CSRC, CITIC, and Shenwan.<sup>18</sup> The historical information about the industry classifications used in the study is obtained from the RESSET database, where we collect yearly data for each classification level of CSRC, CITIC, and Shenwan. We mainly focus on the primary classification of Shenwan as it is the most popular classification system in the Chinese financial sector. At the end of each week, for a focal firm  $i$ , the industry peer firm return, denoted as  $Industry\_Rtn_{it}$ , is calculated as the equal-weighted average excess return of all other stocks from the same industry.

### 2.2.3. Customer–supplier linkages

We follow Cohen and Frazzini (2008) and extract the information about the top-5 customers for all listed firms from their annual reports. However, for Chinese listed firms, the disclosure of the real names of their top customers is not mandated by the China Securities Regulatory Commission (CSRC). Due to the voluntary nature of the disclosure, many firms choose to use digits, English letters, or Chinese numbers to represent their customers instead of providing their real names or stock codes. This makes it challenging to identify firms' customers using the dataset. Moreover, some disclosed customers are not listed firms (they can be local governments, schools, and individuals). As a result, the number of customer–supplier linkages identified is much smaller than other linkages. Summary statistics from Table 2 show that for each trading week, on average, there are only 109 sample stocks whose customers can be clearly identified. To ensure an adequate number of sample firms have customer–supplier linkages, we limit the sample period from January 2010 to December 2020. To avoid any potential look-ahead bias, we set a lag of six months between the fiscal ending date and the portfolio formation date.<sup>19</sup> At the end of each week, for a focal firm  $i$ , the customer peer firm return  $Customer\_Rtn_{it}$  is computed as the weighted average value of its customers' excess returns.

### 2.2.4. Geographic linkages

According to the findings of Parsons et al. (2020), the stock returns of a firm can be predicted by the returns of its peer firms that are headquartered in the same geographic location. In our study, we define geographic peer firms at both the province level and the city level in China. The historical data about headquarters locations are obtained

from CSMAR.<sup>20</sup> There are 32 provincial districts (including four municipalities, five provincial autonomous regions, and 23 provinces) and 399 cities (including four municipalities). In our analysis, we consider all firms located within the same province or city as geographic peers (i.e., two types of geographic linkages). At the end of each week, for a focal firm  $i$ , the geographic peer firm return  $Geographic\_Rtn_{it}$  is calculated as the equal-weighted excess return of all of its geographic neighbor firms.

### 2.2.5. Technology linkages

We follow the methodology in Lee et al. (2019) and define the technology peer firms based on technology similarity. The patent data is from the CCER database which provides detailed patent information for listed firms, including the International Patent Classification (IPC) patent class and the patent grant date. Technology similarity between firm  $i$  and  $j$  at time  $t$  is computed as

$$TECH_{ijt} = \frac{(T_{it}T'_{jt})}{(T_{it}T'_{it})^{1/2}(T_{jt}T'_{jt})^{1/2}}.$$

$T_{it} = (T_{it1}, T_{it2}, \dots, T_{itm})$  is the proportion vector of patents among each class in IPC in the five years preceding time  $t$  for firm  $i$ , where  $m$  is the number of all classifications. At the end of each week, for a focal firm  $i$ , the technology peer firm return,  $Technology\_Rtn_{it}$ , is the average return of its technology peer firms weighted by their technology similarity. To avoid the look-ahead bias, we set a lag of at least six months between the fiscal-year end and the portfolio formation date.

### 2.2.6. Statistical linkages

He et al. (2021) find that a firm's return can be predicted by the past return of firms that are similar to it on some particular characteristics. In line with their work, we define statistical peer firms as stocks that have the closest Euclidean distance on five firm-level characteristics: closed stock price ( $P$ ), firm size ( $SIZE$ ), book-to-market ratio ( $BM$ ), ROE ( $ROE$ ), and assets growth ( $AG$ ).<sup>21</sup> The distance between firm  $i$  and firm  $j$  is computed as:

$$d_{ij} = \sqrt{(P_i - P_j)^2 + (SIZE_i - SIZE_j)^2 + (BM_i - BM_j)^2 + (ROE_i - ROE_j)^2 + (AG_i - AG_j)^2}.$$

At the end of each week, for a focal firm  $i$ , we calculate the distances of all other firms with it, and the top 10% of firms with the smallest distances are considered as the statistical peers of firm  $i$ .<sup>22</sup> The statistical peer firm return  $Statistical\_Rtn_{it}$  is then calculated as the equal-weighted excess return of its statistical peer firms.

<sup>17</sup> In the Chinese stock market, analyst reports are often produced by a team of analysts rather than individual analysts. In our study, we consider all analysts within a team as a cohesive unit and do not distinguish them as individual analysts. In other words, two stocks are defined as shared-analyst peer firms only if they are covered by the same analyst team. This approach acknowledges that analyst reports are collaborative efforts that incorporate the ideas and insights of the entire team.

<sup>18</sup> In 2020, for the CSRC system, there are 19 primary industries and 81 secondary industries in the sample. For the CITIC system, there are 29 primary industries, 83 secondary industries, and 188 tertiary industries in the sample. For the Shenwan system, there are 28 primary industries, 104 secondary industries, and 227 tertiary industries in the sample.

<sup>19</sup> For example, for July to December 2020, we use the customer information disclosed in the annual report of 2019, while for January to June 2020, we use the customer information disclosed in the annual report of 2018.

<sup>20</sup> In the context of China, firms are typically associated with two geographical locations: the location of their headquarters and the place of registration. In most cases, these two locations are the same. However, if there is a difference between the two, we prioritize the location of the headquarters. If the information regarding the headquarters location is not available but the registration address is, we use the registration address as a substitute.

<sup>21</sup> To avoid the look-ahead bias, we use accounting variables ( $BM$ ,  $ROE$ , and  $AG$ ) that are lagged by at least one year. For example, from January to June, the variables are based on the fiscal report two years ago, while from July to December, they are based on the fiscal report one year ago. For  $SIZE$ , the total market value at the end of June last year is used for the first half of the year, while the total market value at the end of June this year is used for the second half of the year.  $P$  is the weekly closed price at the end of the trading week. Each of the five variables is standardized by its cross-sectional mean and standard deviation.

<sup>22</sup> Different from He et al. (2021) where 50 smallest distances are used to define similar stocks in the US market, it may be more appropriate to use a percentage rather than a fixed number to define similar stocks in the Chinese market. This is because the number of A-shares in China has significantly increased over the past decades. By using a percentage of the sample size, we can maintain a consistent criterion for defining similar stocks regardless of changes in the overall market size.

### 2.2.7. Concept linkages

In the stock market, one “concept” refers to a group of stocks that share a specific trend or topic, such as new energy or e-commerce. Following Du et al. (2022b), two firms are considered concept peers if they belong to the same concept. The historical records of concepts and constituent stocks used in our study are obtained from the publicly accessible RESSET database.<sup>23</sup> Due to data availability, the sample period for concept momentum analysis in our study spans from August 2016 to December 2020. During this period, we identify a total of 336 concepts. Table 2 shows that for each week during the sample period, there are 2,970 sample stocks with concept linkages on average. At the end of each week, for a focal firm  $i$ , the concept peer firm return  $Concept\_Rtn_{it}$  is the weighted average returns of its concept peers, where the weight is the number of common concepts.

### 2.3. Summary statistics

Table 2 presents the summary statistics for different linkage types. We have also computed the link density of the various stock networks and the number of firms incorporated into the sample annually, which are detailed in Table A.2 of Appendix A. Several observations can be made from these data. Firstly, when comparing two strategies for identifying news co-mention links, we find that under the *Sentence\_3* strategy, each focal firm has, on average, nine peer firms, which is fewer than the 16 peers identified under the *Article\_3* strategy. This is consistent with our expectations, as the *same\_sentence* strategy likely removes potential noise links present in the *same\_article* strategy, resulting in fewer links being identified. Additionally, the number of peer firms identified increases with the length of the identification window. For other linkage types (except customer–supplier), we generally observe a higher number of links, with each sample stock tending to have more peers on average.

## 3. Portfolio analysis

In this section, we examine the relationship between past peer firm return signals computed using various types of linkages and future stock returns. At the end of each trading week, all sample stocks are sorted into quintiles according to peer firm return signals computed using various linkages. Stocks are equal-weighted within each quintile group. The long–short portfolio involves buying the highest group and selling the lowest group. All portfolios are held for one week and are rebalanced weekly. In addition to reporting the average return over the risk-free rate, we also calculate the alpha using the CH-4-factor model. The weekly returns and alphas are then converted to a monthly frequency for better comparability with existing literature.

### 3.1. News co-mention momentum spillover

We first report the main results for news co-mention momentum spillovers. Table 3 presents the results of eight trading strategies based on different identification strategies (*same\_sentence* and *same\_article*) and window lengths (3 months, 6 months, 9 months, and 12 months). Panel A and Panel B show the excess returns, and CH-4 adjusted alphas of each portfolio, respectively.

Overall, the eight long–short portfolios that exploit news co-mention momentum spillovers exhibit statistically and economically significant positive excess returns, which cannot be explained by the CH-4 factors, including the market, size, value, and abnormal turnover rate. Among

the eight strategies, *Sentence\_3* performs the best and yields a monthly return of 1.94% (t-statistic = 5.33), and even the worst performing one (*Article\_12*) yields a monthly return of 1.36% (t-statistic = 4.49). The Spearman correlation coefficients between the rank of news-based peer firm returns and the long-only portfolio returns are equal to one or close to one. This indicates a positive and monotonic relationship between the two variables, suggesting that higher news-based peer firm returns are associated with higher long-only portfolio returns.<sup>24</sup>

When comparing the eight news-based trading strategies that employ different identification strategies and identification window lengths, we observe that while the overall news co-mention momentum spillover effect is strong, there are substantial differences among the eight strategies. First, for the same identification window length, *same\_sentence* strategy always performs better than *same\_article* strategy. Taking the 3-month windows as an example, *Sentence\_3* strategy generates a long–short return and alpha of 1.94% (t-statistics=5.33) and 1.86% (t-statistic = 5.23) respectively, higher than 1.63% (t-statistic = 1.63) and 1.58% (t-statistic = 5.16) for that of *Article\_3*. The results are similar for other identification windows, indicating that *same\_sentence* might be more effective in identifying links among firms. This is because when two firms appear in the same article but in different sentences, there are chances that they are actually unrelated to each other.

In addition, when keeping the link identification strategy fixed, the returns of the long–short portfolio decrease as the length of the identification window increases. Unlike other linkages, such as industry and technology links, which tend to be more stable and persistent over the long term, news is highly time-sensitive and reflects recent market information. News-based linkages capture immediate market sentiment, investor behaviors, and breaking news events, all of which can quickly change. Consequently, news linkages are less persistent compared to other types and can exhibit rapid shifts as new information becomes available. Using a long identification window may incorporate outdated news that is no longer relevant, which might explain the observed results. However, a shorter identification window results in a smaller number of sample stocks with news-implied linkages. For instance, if we adopt the *same\_sentence* strategy and use a 1-month window to identify the links, there are only about 500 sample stocks on average each week that have news-implied links. To strike a balance between capturing an adequate amount of news co-mentions and avoiding the inclusion of very stale information, the shortest identification window we use in this paper is 3 months. Given that the *Sentence\_3* strategy generates the largest returns among the eight candidates, we use the *Sentence\_3* strategy for subsequent comparisons with other momentum spillover effects.

We have also analyzed the dynamics of news co-mention momentum spillovers and compared these with market dynamics over the sample period. As illustrated in Fig. 1, subplot 1 displays the weekly returns, subplot 2 shows the cumulative returns, and subplot 3 presents the annualized rolling Sharpe ratios of the long–short portfolio based on news co-mention momentum from the beginning of 2012 to the end of 2020. The stock market crash of 2015 is marked by a black vertical line in the figures.

In subplot 1, the weekly returns of the news co-mention momentum portfolio are less volatile than the market throughout the entire sample period, including during the 2015 market crash. Subplot 2 shows that while the market's cumulative returns dropped sharply around the crash, the cumulative returns of the news co-mention momentum consistently increased during this period. Subplot 3 reveals that the

<sup>23</sup> We acknowledge that there may be differences in the data sources and quality between our study and Du et al. (2022b). They spent a lot of effort scraping the concept data from the Joinquant database. Since concept momentum is not our main focus, we rely on publicly available data, which may have limitations in terms of coverage and quality.

<sup>24</sup> We also conducted exercises using the two alternative weighting schemes. In unreported tables, we find that our results are robust to different weightings. However, signals using firm size or word-based distance as weights generate smaller monthly returns and alphas, though they remain statistically significant. This suggests that the number of co-mentions is a more effective measure of proximity.

**Table 3**

The news co-mention momentum spillover: portfolio sorting results.

| Panel A: Excess returns       |                              |                              |                              |                              |                              |                              |                              |                              |
|-------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Identification windows        | <i>same_sentence</i>         |                              |                              |                              | <i>same_article</i>          |                              |                              |                              |
|                               | 3-month                      | 6-month                      | 9-month                      | 12-month                     | 3-month                      | 6-month                      | 9-month                      | 12-month                     |
| 1 (Low)                       | 0.74<br>(0.88)               | 0.81<br>(0.96)               | 0.85<br>(1.02)               | 0.84<br>(1.00)               | 0.89<br>(1.07)               | 0.88<br>(1.06)               | 0.85<br>(1.02)               | 0.84<br>(1.01)               |
| 2                             | 1.06<br>(1.32)               | 1.06<br>(1.31)               | 1.01<br>(1.23)               | 0.94<br>(1.15)               | 1.08<br>(1.32)               | 1.06<br>(1.29)               | 1.01<br>(1.23)               | 1.00<br>(1.21)               |
| 3                             | 1.11<br>(1.38)               | 1.16<br>(1.42)               | 1.09<br>(1.34)               | 1.15<br>(1.38)               | 1.20<br>(1.49)               | 1.15<br>(1.40)               | 1.12<br>(1.35)               | 1.09<br>(1.31)               |
| 4                             | 1.38<br>(1.65)               | 1.44<br>(1.71)               | 1.38<br>(1.65)               | 1.37<br>(1.63)               | 1.33<br>(1.60)               | 1.40<br>(1.67)               | 1.39<br>(1.68)               | 1.41<br>(1.68)               |
| 5 (High)                      | 2.68<br>(2.96)               | 2.38<br>(2.66)               | 2.30<br>(2.57)               | 2.22<br>(2.48)               | 2.54<br>(2.84)               | 2.34<br>(2.66)               | 2.26<br>(2.52)               | 2.21<br>(2.49)               |
| 5–1                           | <b>1.94</b><br><b>(5.33)</b> | <b>1.55</b><br><b>(4.97)</b> | <b>1.44</b><br><b>(4.68)</b> | <b>1.37</b><br><b>(4.49)</b> | <b>1.63</b><br><b>(5.30)</b> | <b>1.45</b><br><b>(5.14)</b> | <b>1.40</b><br><b>(4.62)</b> | <b>1.36</b><br><b>(4.49)</b> |
| SpearmanR                     | 1.00                         | 1.00                         | 1.00                         | 1.00                         | 1.00                         | 1.00                         | 1.00                         | 1.00                         |
| P-value                       | 0.00                         | 0.00                         | 0.00                         | 0.00                         | 0.00                         | 0.00                         | 0.00                         | 0.00                         |
| Panel B: CH-4 adjusted alphas |                              |                              |                              |                              |                              |                              |                              |                              |
| Identification windows        | <i>same_sentence</i>         |                              |                              |                              | <i>same_article</i>          |                              |                              |                              |
|                               | 3-month                      | 6-month                      | 9-month                      | 12-month                     | 3-month                      | 6-month                      | 9-month                      | 12-month                     |
| 1 (Low)                       | 0.41<br>(0.49)               | 0.48<br>(0.56)               | 0.51<br>(0.61)               | 0.49<br>(0.59)               | 0.55<br>(0.66)               | 0.53<br>(0.63)               | 0.51<br>(0.61)               | 0.50<br>(0.60)               |
| 2                             | 0.78<br>(0.98)               | 0.74<br>(0.92)               | 0.69<br>(0.84)               | 0.61<br>(0.75)               | 0.77<br>(0.95)               | 0.74<br>(0.91)               | 0.67<br>(0.82)               | 0.66<br>(0.80)               |
| 3                             | 0.77<br>(0.98)               | 0.81<br>(1.01)               | 0.71<br>(0.88)               | 0.76<br>(0.94)               | 0.89<br>(1.11)               | 0.81<br>(1.00)               | 0.77<br>(0.94)               | 0.73<br>(0.88)               |
| 4                             | 1.06<br>(1.29)               | 1.10<br>(1.35)               | 1.06<br>(1.30)               | 1.04<br>(1.27)               | 0.99<br>(1.21)               | 1.06<br>(1.30)               | 1.04<br>(1.28)               | 1.07<br>(1.29)               |
| 5 (High)                      | 2.27<br>(2.66)               | 2.00<br>(2.38)               | 1.92<br>(2.26)               | 1.84<br>(2.17)               | 2.14<br>(2.52)               | 1.95<br>(2.34)               | 1.87<br>(2.21)               | 1.83<br>(2.16)               |
| 5–1                           | <b>1.86</b><br><b>(5.23)</b> | <b>1.51</b><br><b>(4.89)</b> | <b>1.41</b><br><b>(4.59)</b> | <b>1.35</b><br><b>(4.38)</b> | <b>1.58</b><br><b>(5.16)</b> | <b>1.42</b><br><b>(4.98)</b> | <b>1.35</b><br><b>(4.45)</b> | <b>1.32</b><br><b>(4.35)</b> |
| SpearmanR                     | 0.90                         | 1.00                         | 1.00                         | 1.00                         | 1.00                         | 1.00                         | 1.00                         | 1.00                         |
| P-value                       | 0.04                         | 0.00                         | 0.00                         | 0.00                         | 0.00                         | 0.00                         | 0.00                         | 0.00                         |

This table reports the portfolio sorting results of the news co-mention momentum spillover effect of the *same\_sentence* type and *same\_article* type under the four identification windows, respectively. *Same\_sentence* strategy considers firms appearing in the same sentence of the same news article during a given identification window as news co-mention peers, while the *same\_article* strategy considers firms appearing in the same article during a given identification window as news co-mention peers. The identification windows include 3-month, 6-month, 9-month, and 12-month. The news co-mention peer firm return of a focal firm is computed as the average excess return of news co-mention peer firms of the focal firm during the identification window, weighted by the number of co-mentions. At the end of each trading week, all sample stocks are sorted quintiles based on the news co-mention peer firm returns. Within each quintile group, the stocks are equally weighted. The long-short portfolio involves buying the highest group and selling the lowest group. All portfolios are held for one week and are rebalanced weekly. The sample period is 2012–2020. Panel A reports the excess returns of portfolios, and Panel B reports the intercepts (alphas) of the regression of the returns on CH-4 factors (market, size, value, abnormal turnover rate) (Liu et al., 2019). All weekly returns and alphas are converted into monthly percentages using compound interest. SpearmanR reports the Spearman correlation coefficient between the portfolio return and the serial number for each sorting. Newey and West (1987) adjusted *t*-statistics are shown in parentheses. Long-short returns/alphas with *t*-statistics higher than 2.00 are highlighted in bold.

annualized Sharpe ratios of the news co-mention momentum remained stable during the market crash period, in contrast to the market's ratios, which plummeted from 5.0 to below 0.

Overall, our dynamic analysis and comparisons demonstrate the robustness of the news co-mention momentum effect throughout the entire sample period. Additionally, its predictive power remained stable, even during the turbulent period around the 2015 market crash.<sup>25</sup>

### 3.2. Other momentum spillovers

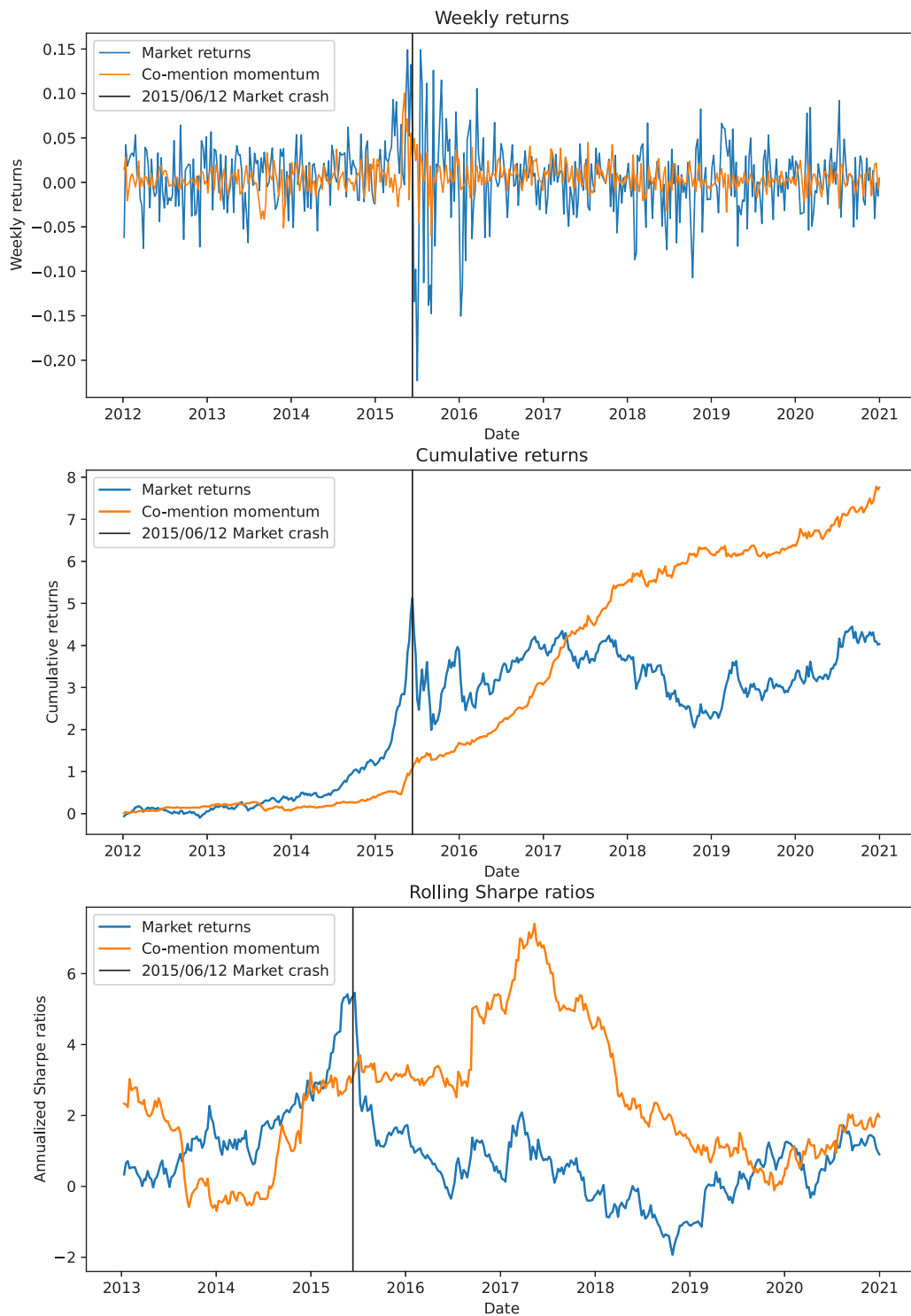
Table 4 reports the portfolio sorting results for cross-momentum strategies based on other types of linkages, including the analyst co-coverage, industry, geographic proximity, customer-supplier, technology, statistical similarity, and concept.

For better comparison, the result of *Sentence\_3* is included as the first column. Panel A provides the excess returns of portfolios, while Panels

B to F present the intercepts from regressions of the returns on different factor models, including the CH-4 factor model (Liu et al., 2019), the Fama–French 3- and 5-factor models (Fama and French, 1993, 2015), Carhart 4-factor model (Carhart, 1997), and the Daniel–Hirshleifer–Sun 3-factor model (Daniel et al., 2020). The Carhart 4-factor model includes a momentum factor, facilitating the examination of the exposure of cross-firm momentum to traditional cross-sectional momentum. The DHS 3-factor model, grounded in behavioral theory, comprises the market factor along with two factors capturing long- and short-term mispricing.

Most of these cross-momentum anomalies observed in the US market also exist in the Chinese stock market. In particular, the momentum spillover via statistical linkages yields a monthly long-short average excess return and alpha of 1.36% (*t*-statistic = 3.93) and 1.34% (*t*-statistic = 3.35), respectively, which is the second-highest among all strategies, following the *Sentence\_3* strategy. The analyst co-coverage momentum spillover was found to unify all momentum spillover effects in the US market. In the Chinese stock market, a long-short portfolio based on that yields an average return of 0.86% (*t*-statistic = 3.33) and CH-4 alpha of 0.85% (*t*-statistic = 2.97). Long-short average return and alpha based on industry momentum using Shenwan-1 industry

<sup>25</sup> In unreported tables, we find that the news co-mention momentum retains its strong and significant predictive power both outside of and within the 2015–2016 bubble period in China's stock market.



**Fig. 1.** Dynamics of the news co-mention momentum.

This figure shows the dynamic performance of the news co-mention momentum under the identification window of 3-month. Subplots 1–3 show weekly returns, cumulative returns, and annualized rolling Sharpe ratios of the long-short portfolio of the news co-mention momentum from the beginning of 2012 to the end of 2020, respectively. The stock market crash that happened in 2015 is marked by the black vertical line.

**Table 4**  
Other momentum spillovers: portfolio sorting results.

| Panel A: Excess returns            |                       |                       |                       |                       |                       |                  |                       |                       |                       |
|------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------|-----------------------|-----------------------|-----------------------|
|                                    | News co-mention       | Analyst               | Industry              | Province              | City                  | Customer         | Technology            | Statistical           | Concept               |
| 1                                  | 0.74<br>(0.88)        | 1.18<br>(1.59)        | 1.35<br>(1.82)        | 1.51<br>(2.06)        | 1.61<br>(2.15)        | 0.92<br>(1.19)   | 1.54<br>(2.05)        | 0.91<br>(1.22)        | −0.45<br>(−0.50)      |
| 5                                  | 2.68<br>(2.96)        | 2.04<br>(2.74)        | 2.12<br>(2.74)        | 1.86<br>(2.42)        | 1.79<br>(2.35)        | 0.38<br>(0.48)   | 2.12<br>(2.72)        | 2.28<br>(3.03)        | 0.36<br>(0.44)        |
| 5–1                                | <b>1.94</b><br>(5.33) | <b>0.86</b><br>(3.33) | <b>0.77</b><br>(3.25) | <b>0.35</b><br>(2.77) | <b>0.18</b><br>(2.05) | −0.53<br>(−1.46) | <b>0.58</b><br>(2.73) | <b>1.36</b><br>(3.93) | <b>0.81</b><br>(2.25) |
| Panel B: CH-4 adjusted alphas      |                       |                       |                       |                       |                       |                  |                       |                       |                       |
|                                    | News co-mention       | Analyst               | Industry              | Province              | City                  | Customer         | Technology            | Statistical           | Concept               |
| 1                                  | 0.41<br>(0.49)        | 0.82<br>(1.09)        | 0.98<br>(1.29)        | 1.13<br>(1.52)        | 1.23<br>(1.61)        | 0.72<br>(0.94)   | 1.11<br>(1.45)        | 0.58<br>(0.75)        | −0.40<br>(−0.44)      |
| 5                                  | 2.27<br>(2.66)        | 1.68<br>(2.21)        | 1.74<br>(2.20)        | 1.48<br>(1.89)        | 1.36<br>(1.75)        | 0.12<br>(0.16)   | 1.71<br>(2.14)        | 1.93<br>(2.51)        | 0.33<br>(0.39)        |
| 5–1                                | <b>1.86</b><br>(5.23) | <b>0.85</b><br>(2.97) | <b>0.76</b><br>(3.00) | <b>0.34</b><br>(2.56) | 0.13<br>(1.37)        | −0.60<br>(−1.43) | <b>0.60</b><br>(2.64) | <b>1.34</b><br>(3.35) | 0.74<br>(1.89)        |
| Panel C: FF-3 adjusted alphas      |                       |                       |                       |                       |                       |                  |                       |                       |                       |
|                                    | News co-mention       | Analyst               | Industry              | Province              | City                  | Customer         | Technology            | Statistical           | Concept               |
| 1                                  | 0.37<br>(0.49)        | 0.70<br>(1.09)        | 0.86<br>(1.33)        | 1.05<br>(1.66)        | 1.14<br>(1.77)        | 0.56<br>(0.88)   | 1.06<br>(1.63)        | 0.47<br>(0.70)        | −0.63<br>(−0.73)      |
| 5                                  | 2.33<br>(3.01)        | 1.64<br>(2.55)        | 1.67<br>(2.52)        | 1.38<br>(2.10)        | 1.29<br>(1.98)        | 0.07<br>(0.11)   | 1.68<br>(2.49)        | 1.85<br>(2.88)        | 0.24<br>(0.30)        |
| 5–1                                | <b>1.95</b><br>(5.35) | <b>0.93</b><br>(3.45) | <b>0.81</b><br>(3.30) | <b>0.32</b><br>(2.69) | 0.15<br>(1.80)        | −0.49<br>(−1.31) | <b>0.61</b><br>(2.84) | <b>1.37</b><br>(3.90) | <b>0.88</b><br>(2.33) |
| Panel D: FF-5 adjusted alphas      |                       |                       |                       |                       |                       |                  |                       |                       |                       |
|                                    | News co-mention       | Analyst               | Industry              | Province              | City                  | Customer         | Technology            | Statistical           | Concept               |
| 1                                  | 0.24<br>(0.31)        | 0.63<br>(0.95)        | 0.78<br>(1.18)        | 0.97<br>(1.49)        | 1.04<br>(1.59)        | 0.36<br>(0.55)   | 0.97<br>(1.46)        | 0.43<br>(0.62)        | −0.41<br>(−0.48)      |
| 5                                  | 2.15<br>(2.77)        | 1.55<br>(2.34)        | 1.55<br>(2.27)        | 1.27<br>(1.90)        | 1.18<br>(1.76)        | −0.12<br>(−0.19) | 1.55<br>(2.24)        | 1.74<br>(2.63)        | 0.39<br>(0.50)        |
| 5–1                                | <b>1.91</b><br>(5.07) | <b>0.91</b><br>(3.25) | <b>0.77</b><br>(3.01) | <b>0.31</b><br>(2.54) | 0.13<br>(1.51)        | −0.48<br>(−1.31) | <b>0.58</b><br>(2.62) | <b>1.30</b><br>(3.58) | <b>0.81</b><br>(2.16) |
| Panel E: Carhart-4 adjusted alphas |                       |                       |                       |                       |                       |                  |                       |                       |                       |
|                                    | News co-mention       | Analyst               | Industry              | Province              | City                  | Customer         | Technology            | Statistical           | Concept               |
| 1                                  | 0.68<br>(0.86)        | 1.07<br>(1.51)        | 1.24<br>(1.75)        | 1.42<br>(2.02)        | 1.51<br>(2.11)        | 0.92<br>(1.25)   | 1.43<br>(2.00)        | 0.81<br>(1.11)        | −0.48<br>(−0.54)      |
| 5                                  | 2.59<br>(3.16)        | 1.97<br>(2.76)        | 2.03<br>(2.76)        | 1.74<br>(2.40)        | 1.67<br>(2.32)        | 0.35<br>(0.47)   | 2.05<br>(2.75)        | 2.18<br>(3.07)        | 0.38<br>(0.46)        |
| 5–1                                | <b>1.90</b><br>(5.28) | <b>0.90</b><br>(3.40) | <b>0.78</b><br>(3.28) | <b>0.32</b><br>(2.76) | 0.16<br>(1.96)        | −0.57<br>(−1.53) | <b>0.61</b><br>(2.86) | <b>1.36</b><br>(3.91) | <b>0.86</b><br>(2.38) |
| Panel F: DHS-3 adjusted alphas     |                       |                       |                       |                       |                       |                  |                       |                       |                       |
|                                    | News co-mention       | Analyst               | Industry              | Province              | City                  | Customer         | Technology            | Statistical           | Concept               |
| 1                                  | 0.57<br>(0.70)        | 1.01<br>(1.40)        | 1.16<br>(1.62)        | 1.38<br>(1.93)        | 1.47<br>(2.02)        | 0.91<br>(1.22)   | 1.39<br>(1.91)        | 0.72<br>(0.99)        | −0.40<br>(−0.46)      |
| 5                                  | 2.62<br>(2.97)        | 1.94<br>(2.64)        | 2.01<br>(2.67)        | 1.70<br>(2.29)        | 1.62<br>(2.20)        | 0.42<br>(0.56)   | 2.01<br>(2.64)        | 2.17<br>(2.94)        | 0.49<br>(0.58)        |
| 5–1                                | <b>2.04</b><br>(5.42) | <b>0.92</b><br>(3.49) | <b>0.84</b><br>(3.51) | <b>0.32</b><br>(2.69) | 0.15<br>(1.77)        | −0.49<br>(−1.30) | <b>0.61</b><br>(2.86) | <b>1.44</b><br>(4.22) | <b>0.89</b><br>(2.46) |

This table reports the portfolio sorting performance of the shared-analyst momentum, industry momentum, geographic momentum, customer momentum, technology momentum, statistical momentum, and concept momentum. For comparison, the result for the news co-mention momentum of *same\_sentence* type under the 3-month identification window (*Sentence\_3*) is shown in the first column. The industry momentum spillover is based on the first level of the Shenwan classification (Shenwan-1), and the results are shown in column 3. The geographic momentum spillover is constructed at both the province and city levels, and the results are shown in columns 4 and 5, respectively. Columns 6–9 present the results for customer momentum, technology momentum, statistical momentum, and concept momentum, respectively. Due to data quality, the sample period of news co-mention momentum is 2012–2020, the sample period of customer momentum is 2010–2020, the sample period of concept momentum is Aug. 2016–2020, and the sample periods for other momentums are 2006–2020. For each linkage type, at the end of each trading week, we first calculate the peer returns of all focal firms and then sort all stocks into quintiles based on the peer firm return. Within each quintile group, the stocks are equally weighted. The long-short portfolio involves buying the highest group and selling the lowest group. All portfolios are held for one week and are rebalanced weekly. Panel A gives the excess returns of portfolios, and Panel B–F present the intercepts of regressions of the returns on different factor models including the CH-4 factor model (Liu et al., 2019), the Fama–French 3-, 5-factor models (Fama and French, 1993, 2015), Carhart 4-factor model (Carhart, 1997) (including a momentum factor), and the behavior-based Daniel–Hirshleifer–Sun 3-factor model (Daniel et al., 2020). All weekly returns and alphas are converted into monthly percentages using compound interest. Newey and West (1987) adjusted *t*-statistics are shown in parentheses. Long-short returns/alphas with *t*-statistics higher than 2.00 are highlighted in bold.

classification are 0.77% (t-statistic = 3.25) and CH-4 alpha of 0.76% (t-statistic = 3.00), respectively. The technology momentum generates a slightly lower average return and alpha of 0.58% (t-statistic = 2.73) and 0.60% (t-statistic = 2.64). Although we have a short sample for concept momentum, it produces a mean return of 0.81% (t-statistic = 2.25) per month.<sup>26</sup>

Among all the cross-momentum strategies examined, only the customer momentum strategy does not yield statistically significant positive returns or CH-4 alpha. We attribute the insignificance of the customer momentum to the low quality and limited availability of disclosed customer data for listed firms in China. As previously mentioned, only a small number of firms choose to disclose the real names of their customers, and the majority of disclosed customers are not listed firms. Consequently, the sample that we can use to do portfolio analysis is small. To avoid potential bias resulting from this small sample size, we exclude the customer momentum in later analysis.

In the Chinese stock market, the geographic momentum is not strong. Province-level momentum is statistically significant but the long-short strategy based on that yields only a small average return of 0.35% per month. City-level momentum is even weaker and is not significant after controlling for the CH-4 factors.

Alongside the CH-4 model, we have incorporated the Fama–French 3- and 5-factor models (Fama and French, 1993, 2015), the Carhart 4-factor model (Carhart, 1997), and the Daniel–Hirshleifer–Sun 3-factor model (Daniel et al., 2020) into our analysis. Our main conclusions remain robust across these diverse factor models. Notably, the news co-mention momentum consistently generates long-short alphas higher than 1.90% per month under the FF-3, FF-5, Carhart-4, and DHS-3 models, significantly outperforming other cross-firm momentum effects. Given the outstanding performance of the news co-mention momentum, it naturally raises the question: Does the news co-mention momentum spillover encompass and unify the various other momentum spillover effects?

#### 4. The unifying effect

In this section, we examine whether the news co-mention momentum spillover effect encompasses and unifies the various other momentum spillover effects observed in the Chinese stock market. To do so, we utilize spanning tests and Fama and MacBeth (1973) regressions following Ali and Hirshleifer (2020). Additionally, we investigate the differences in information content between news co-mentions and other proxies to gain further insights into the characteristics of news-implied linkages.

##### 4.1. Factor spanning tests

To examine whether the anomaly returns of different types of momentum spillovers can be explained by each other, we construct an augmented CH-4 model as follows:

$$R_t = \alpha + \beta_{MKT} MKT_t + \beta_{SMB} SMB_t + \beta_{HML} HML_t + \beta_{PMO} PMO_t + \beta_{MS} MS_t,$$

where  $R_t$  is the target anomaly return of one momentum spillover factor to be explained, and the  $MS$  (momentum spillover) factor on the right-hand side is another momentum spillover factor used as an additional explanatory variable. We use “CH-4+a specific  $MS$  factor” to indicate the set of explanatory variables used to explain the target momentum spillover factor  $R_t$ . For example, CH-4+Sentence\_3

means the set of explanatory variables includes CH-4 factors plus a news co-mention momentum factor of the *Sentence\_3* type. If the news co-mention momentum factor does explain the momentum spillover factor  $R_t$ , we should observe the alpha from the CH-4+Sentence\_3 model to be small and potentially insignificant after controlling for the news co-mention momentum factor. Additionally, the  $\beta_{MS}$  should be significantly positive.

Panel A of Table 5 shows the alpha of regressing the time series of the target momentum spillover factor  $R_t$  on the CH-4 factors plus a specific  $MS$  factor. The column name corresponds to the name of the target factor  $R_t$ , and the row name indicates the set of variables in the augmented CH-4 model. All news co-mention momentum factors are constructed using the *same\_sentence* identification strategy, which has demonstrated superior performance.<sup>27</sup> We find that most of the news co-mention momentum spillover factors, particularly those using a short identification window to establish links, are capable of explaining other non-news momentum spillover factors. For instance, after controlling for the *Sentence\_3* factor, the alphas of all other momentum spillover factors become small and insignificant. While the CH-4 alpha of the statistical momentum factor is as large as 1.34% (t-statistic = 3.35), it reduces to only 0.17% (t-statistic = 0.43) when the *Sentence\_3* factor is included. Additionally, the alphas for the analyst, industry, technology, and concept momentum factors turn negative after incorporating the *Sentence\_3* factor as an additional regressor.

The results are similar for the *Sentence\_6*, *Sentence\_9*, and *Sentence\_12* factors, all of which exhibit strong explanatory power for other non-news momentum factors. An exception is the geographic momentum factor; although it has insignificant alpha in the CH-4+*Sentence\_3* model, the alpha is positive and significant when the  $MS_t$  control variable is any of the three longer-term news co-mention factors. This observation aligns with our earlier findings that the strength of news co-mention momentum diminishes as the length of the identification window increases. Notably, the *Sentence\_3* momentum factor can explain the news co-mention momentum with longer identification windows, but not vice versa.

As a comparison, we also attempt to explain the news co-mention momentum spillover factors using other non-news momentum spillover factors, including those based on analyst co-coverage, industry, geographic, technology, statistical, and concept momentum. We found that none of these factors could fully explain the four news co-mention momentum spillover factors, as the alphas remained large and significant. For example, the momentum spillover via statistical linkages yields a high monthly long-short return and a CH-4 alpha, ranking it second-highest among all trading strategies. Nevertheless, the *Sentence\_3* momentum factor still generates an alpha of 1.16% per month (t-statistic = 4.17) under the CH-4+Statistical model. Moreover, even the weakest news co-mention momentum spillover factor, the *Sentence\_12* factor, achieves a CH-4+Statistical alpha of 0.51% per month (t-statistic = 2.57). The analyst co-coverage momentum factor, known to explain all other cross-momentum factors in the U.S. market, fails to account for either the news co-mention momentum spillover factors or the statistical momentum factor. In the last row of panel A, we included all six non-news-related momentum spillover factors as additional explanatory variables. Even when combining all the non-news linkages into *Non\_news*, the CH-4+*Non\_news* model does not explain the news co-mention momentum spillover factors.<sup>28</sup>

<sup>26</sup> Unlike the results reported by Du et al. (2022b), our concept momentum strategy generates insignificant alpha after adjusting for the CH-4 factor. We believe that the discrepancy in results can be attributed to the difference in data sources related to concepts. They have utilized web-crawling technology to obtain additional and longer historical records about concepts, which may have contributed to their significant findings.

<sup>27</sup> As a robustness check, we also conducted spanning tests using the *same\_article* strategy. The results, reported in Table D.10 in Section 6.5.4, show similar outcomes.

<sup>28</sup> In the CH-4+*Non\_news* model, all six non-news factors are included as explanatory variables. However, given concerns about the small sample size of the concept momentum potentially impacting our results, we performed a robustness check by excluding the concept momentum variable from the

**Table 5**  
Factor spanning test.

| Panel A: Alphas of factor spanning tests |                       |                         |                         |                         |                         |                         |                        |                        |                        |                        |
|------------------------------------------|-----------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|
|                                          | Sentence_3            | Sentence_6              | Sentence_9              | Sentence_12             | Analyst                 | Industry                | Geographic             | Technology             | Statistical            | Concept                |
| CH-4+Sentence_3                          |                       | −0.15<br>(−1.51)        | −0.22<br>(−1.76)        | −0.30<br>(−2.15)        | −0.44<br>(−1.76)        | −0.53<br>(−2.10)        | 0.25<br>(1.92)         | −0.26<br>(−1.11)       | 0.17<br>(0.43)         | −0.51<br>(−1.59)       |
| CH-4+Sentence_6                          | <b>0.37</b><br>(3.48) |                         | −0.08<br>(−1.17)        | −0.16<br>(−1.80)        | −0.34<br>(−1.47)        | −0.45<br>(−1.93)        | <b>0.27</b><br>(2.11)  | −0.21<br>(−0.95)       | 0.26<br>(0.71)         | −0.41<br>(−1.37)       |
| CH-4+Sentence_9                          | <b>0.54</b><br>(3.95) | <b>0.16</b><br>(2.16)   |                         | −0.08<br>(−1.62)        | −0.25<br>(−1.13)        | −0.38<br>(−1.76)        | <b>0.26</b><br>(2.08)  | −0.17<br>(−0.79)       | 0.30<br>(0.91)         | −0.31<br>(−1.10)       |
| CH-4+Sentence_12                         | <b>0.65</b><br>(4.27) | <b>0.27</b><br>(2.88)   | <b>0.11</b><br>(2.30)   |                         | −0.17<br>(−0.81)        | −0.32<br>(−1.53)        | 0.27<br>(2.15)         | −0.13<br>(−0.60)       | 0.36<br>(1.13)         | −0.26<br>(−0.94)       |
| CH-4+Analyst                             | <b>1.18</b><br>(4.97) | <b>0.80</b><br>(4.25)   | <b>0.67</b><br>(3.79)   | <b>0.58</b><br>(3.47)   |                         | 0.11<br>(0.76)          | 0.24<br>(1.83)         | 0.17<br>(0.99)         | <b>0.70</b><br>(2.18)  | 0.06<br>(0.28)         |
| CH-4+Industry                            | <b>1.35</b><br>(5.08) | <b>0.98</b><br>(4.49)   | <b>0.84</b><br>(4.30)   | <b>0.76</b><br>(4.03)   | 0.15<br>(0.96)          |                         | 0.25<br>(1.92)         | 0.14<br>(0.87)         | <b>0.78</b><br>(2.25)  | 0.33<br>(1.67)         |
| CH-4+Geographic                          | <b>1.62</b><br>(4.94) | <b>1.28</b><br>(4.38)   | <b>1.13</b><br>(3.94)   | <b>1.06</b><br>(3.72)   | <b>0.59</b><br>(2.21)   | <b>0.55</b><br>(2.26)   |                        | <b>0.44</b><br>(2.07)  | <b>1.05</b><br>(2.61)  | 0.34<br>(0.92)         |
| CH-4+Technology                          | <b>1.49</b><br>(4.63) | <b>1.12</b><br>(4.07)   | <b>0.99</b><br>(3.86)   | <b>0.91</b><br>(3.63)   | 0.34<br>(1.59)          | 0.27<br>(1.41)          | <b>0.27</b><br>(2.05)  |                        | <b>0.93</b><br>(2.50)  | 0.25<br>(0.98)         |
| CH-4+Statistical                         | <b>1.16</b><br>(4.17) | <b>0.77</b><br>(3.28)   | <b>0.61</b><br>(2.90)   | <b>0.51</b><br>(2.57)   | 0.20<br>(0.90)          | 0.23<br>(0.97)          | 0.23<br>(1.69)         | 0.25<br>(1.24)         |                        | 0.04<br>(0.14)         |
| CH-4+Concept                             | <b>1.33</b><br>(4.06) | <b>0.89</b><br>(3.65)   | <b>0.71</b><br>(3.08)   | <b>0.60</b><br>(2.81)   | 0.29<br>(1.30)          | −0.16<br>(−0.89)        | <b>0.35</b><br>(2.19)  | 0.04<br>(0.18)         | <b>0.92</b><br>(2.61)  |                        |
| CH-4+Non_news                            | <b>1.15</b><br>(3.59) | <b>0.72</b><br>(3.00)   | <b>0.52</b><br>(2.22)   | <b>0.40</b><br>(1.92)   |                         |                         |                        |                        |                        |                        |
| Panel B: CH-4+Sentence_3 factor loading  |                       |                         |                         |                         |                         |                         |                        |                        |                        |                        |
|                                          | Sentence_3            | Sentence_6              | Sentence_9              | Sentence_12             | Analyst                 | Industry                | Geographic             | Technology             | Statistical            | Concept                |
| Sentence_3                               |                       | <b>0.896</b><br>(28.82) | <b>0.878</b><br>(23.66) | <b>0.886</b><br>(21.14) | <b>0.835</b><br>(11.93) | <b>0.748</b><br>(10.92) | <b>0.086</b><br>(4.09) | <b>0.518</b><br>(7.12) | <b>0.862</b><br>(8.50) | <b>0.747</b><br>(6.68) |
| mktrf                                    |                       | −0.012<br>(−1.10)       | −0.014<br>(−0.82)       | −0.028<br>(−1.54)       | −0.085<br>(−3.55)       | −0.069<br>(−2.60)       | 0.011<br>(0.84)        | −0.034<br>(−1.42)      | −0.078<br>(−1.73)      | −0.012<br>(−0.30)      |
| VMG                                      |                       | −0.008<br>(−0.36)       | −0.008<br>(−0.25)       | −0.007<br>(−0.21)       | −0.001<br>(−0.02)       | −0.018<br>(−0.26)       | −0.027<br>(−1.00)      | −0.051<br>(−0.73)      | 0.019<br>(0.17)        | 0.004<br>(0.04)        |
| SMB                                      |                       | 0.010<br>(0.46)         | 0.006<br>(0.19)         | 0.016<br>(0.42)         | 0.044<br>(0.75)         | 0.054<br>(0.85)         | −0.001<br>(−0.05)      | −0.026<br>(−0.46)      | 0.068<br>(0.61)        | 0.025<br>(0.26)        |
| PMO                                      |                       | −0.032<br>(−2.03)       | −0.037<br>(−1.97)       | −0.057<br>(−2.05)       | −0.082<br>(−2.06)       | −0.036<br>(−0.79)       | −0.018<br>(−1.16)      | −0.059<br>(−1.49)      | −0.203<br>(−2.33)      | 0.087<br>(0.97)        |
| Adj. R2                                  |                       | 0.881                   | 0.824                   | 0.797                   | 0.525                   | 0.460                   | 0.063                  | 0.275                  | 0.355                  | 0.351                  |
| # Obs.                                   |                       | 464                     | 464                     | 464                     | 464                     | 464                     | 464                    | 464                    | 464                    | 227                    |

Panel A reports the intercept (or alpha) of regressing the time series of different long-short momentum returns on the CH-4 factors (*MKT*, *SMB*, *HML*, *PMO*) (Liu et al., 2019) plus each *MS* cross-firm momentum factor. The construction of the *MS* factor is given in Section 4.1. The column name indicates the type of long-short momentum return (i.e., the dependent variable), while the row name means the augmented CH-4 model (i.e., the original CH-4 model plus a specific *MS* factor). For example, the alphas of the row CH-4+Sentence\_3 indicate the alphas from the time-series regressions of long-short portfolio returns of other momentums on *MKT*, *SMB*, *HML*, *PMO* and the Sentence\_3 factor. In the last row of panel A, we include all the six momentum spillover factors that are not related to news as additional explanatory variables. All news co-mention momentum factors are based on *same\_sentence* type under identification windows including 3-month, 6-month, 9-month, and 12-month. The industry momentum is based on the Shenwan-1 classification, while the geographic momentum is based on the province level. We do not consider the customer momentum due to the low data quality. The sample period of news co-mention momentum is 2012–2020. The sample period of concept momentum is Aug. 2016–2020. The sample periods for other momentums are 2006–2020. Newey and West (1987) adjusted *t*-statistics are shown in parentheses. Alphas with *t*-statistics higher than 2.00 are highlighted in bold. Panel B reports the factor loadings of other momentum spillover long-short returns on the CH-4+Sentence\_3 model. Coefficients with *t*-statistics higher than 2.00 are highlighted in bold.

Given that the Sentence\_3 factor exhibits strong explanatory power over other factors, we examine the factor loadings of other momentum spillover factors from the CH-4+Sentence\_3 model in Panel B of Table 5. All loading coefficients of the Sentence\_3 factor are significantly positive and substantially greater than the loadings on CH-4, confirming that the Sentence\_3 factor has strong explanatory power over other momentum spillover factors.

We conduct several robustness checks, the detailed results of which can be found in Section 6.5.4. Firstly, we run regressions with the Sentence\_3 factor as the sole explanatory variable (excluding CH-4 factors), detailed in Table D.6. Additionally, we construct industry momentum factors based on alternative industry classifications, with results shown in Table D.8. Furthermore, we perform spanning tests for different sub-sample periods, including 2006–2020 and 2012–2020;

these results are summarized in Table D.9. Finally, in Table D.10, we convert the co-mention momentum from the *same\_sentence* type to the *same\_article* type across the four identification windows. Overall, our main findings remain robust to these changes.

#### 4.2. Fama–Macbeth regression tests

Our spanning tests reveal that all other non-news cross-asset momentum anomalies can be explained by the news co-mention momentum spillover factor. To provide additional evidence, we employ Fama–MacBeth regressions to examine the relationship between the stock excess return in the next week and the weighted average peer firm returns constructed using different linkage proxies.<sup>29</sup> Our control

model. Our results are robust to the exclusion of the concept momentum variable.

<sup>29</sup> The news co-mention peer firm return is based on *Sentence\_3* strategy; the industry peer firm return is based on the Shenwan-1 classification; and the geographic peer firm return is based on peers at the province level.

variables include the size, book-to-market ratio, and stock return in the past week. All independent variables are standardized by their cross-sectional means and standard deviations.

We estimate two sets of regressions based on two different samples. The first one takes the union of all samples of average peer firm returns constructed using different linkage proxies,<sup>30</sup> and the second sample takes the intersection set of all peer return samples. Table 6 presents the results of the two sets of Fama–MacBeth regressions. Panel A and Panel B display the results for the union sample and intersection sample, respectively. Columns 1–7 individually utilize each peer firm return as the dependent variable. The past-one-week news co-mention peer firm return, *Sentence\_3\_Rtn*, demonstrates the strongest predictability power for future returns, both statistically and economically. A one standard deviation increase in the past-one-week *Sentence\_3\_Rtn* is associated with an increase of 27.1 basis points (bps) in future returns, featuring a t-statistic of 5.53. In contrast, the analyst and statistical momentum, which follow news co-mention momentum according to our portfolio analysis, exhibit much weaker predictive powers, with increases of only 7.1 bps (t-statistic = 4.32) and 3.9 bps (t-statistic = 2.57) per standard deviation change in peer firm return, respectively. The geographic peer firm return does not demonstrate significant predictive power for future returns in either the union sample or the intersection sample. These results align with findings from our portfolio sorting and spanning tests.

To examine whether the news co-mention momentum spillover effect subsumes the predictive power of other momentum spillovers, we add *Sentence\_3\_Rtn* and one other non-news momentum spillover return signal into the Fama–MacBeth (FM) regression one by one. The results are reported in columns 8–13 of Panel A in Table 6. In column 8 of Panel A, both *Sentence\_3\_Rtn* and *Analyst\_Rtn* are included in the regression. The coefficient and t-statistic of *Sentence\_3\_Rtn* hardly change with the inclusion of *Analyst\_Rtn*. On the other hand, the coefficient of *Analyst\_Rtn* decreases substantially, by 56%, from 0.071 to 0.031. A one standard deviation increase in *Sentence\_3\_Rtn* predicts an increase of 26.5 bps in the future return, while a one standard deviation increase in *Analyst\_Rtn* predicts an increase of just 3.1 bps in the future return. When we include *Sentence\_3\_Rtn* and any other peer firm return in the regression analysis, we reach similar conclusions that the predictive powers of all other lagged peer firm returns decrease significantly once the *Sentence\_3\_Rtn* is controlled. From column 9, including *Sentence\_3\_Rtn* largely weakens *Industry\_Rtn*, whose coefficient becomes insignificant. As shown in column 5, the technology peer firm return alone is a strong predictor of future returns. However, the coefficient of *Technology\_Rtn* becomes insignificant once *Sentence\_3\_Rtn* is added. Comparing columns 6 and 12, we find that the coefficient of the statistical peer return decreases by more than 50% after the inclusion of *Sentence\_3\_Rtn*. The geographic and concept momentum effects exhibit similar results. Comparing columns 4 and 10, as well as columns 7 and 13 of the table, the coefficients of *Geographic\_Rtn* and *Concept\_Rtn* are not significant, regardless of whether we control for the news co-mention momentum variable in the regression. This observation aligns with previous portfolio sorting analysis, indicating that the geographic and concept momentum effects lack statistical and economic significance. Finally, in column 14 of Table 6, we present the FM regression results with all peer firm return signals included.<sup>31</sup> *Sentence\_3\_Rtn* continues to be a strong predictor of future stock returns, even after controlling for all previously documented cross-firm momentums simultaneously. Based on the union sample, Panel A shows that *Sentence\_3\_Rtn* exhibits the strongest predictive power among all past peer firm returns. A one standard deviation increment in *Sentence\_3\_Rtn* is associated with an increase of 25.7 basis points in

future returns, with a t-statistic of 5.29. In contrast, all other peer firm returns lose their predictive power in this comprehensive regression. Using the intersection sample to conduct FM regressions leads to similar results, which are shown in Panel B of Table 6.

Overall, these results suggest that analyst momentum, which unifies all momentum spillover effects in the US market (Ali and Hirshleifer, 2020), does not exhibit the same predictive power in the Chinese market. Instead, its role is assumed by news co-mention momentum. The results from the Fama–MacBeth regressions align with those from previous portfolio sorting analyses and factor-spanning tests, further evidencing the strong and robust predictive power of past news co-mention peer firm returns for future stock returns. Moreover, the predictive power of news co-mention peer firm returns largely subsumes the predictability of other types of momentum spillover effects. This is consistent across both the union sample and the intersection sample.

#### 4.3. Further analysis

The factor-spanning test and Fama–MacBeth regressions show that in the Chinese stock market, various forms of cross-firm momentum effects can be unified by the news co-mention momentum spillover effect. In this subsection, we delve deeper into the differences in the information content of links implied by news co-mentioning and other proxies, aiming to gain a better understanding of the unique characteristics and effectiveness of news co-mentioning as a linkage identification strategy compared to alternative methods.

As argued by Scherbina and Schlusche (2013) and Schwenkler and Zheng (2019), one of the advantages of news-implied economic linkages is their ability to reveal a broader range of economic linkages. To examine whether news captures more linkage types, we conduct an exercise to analyze the within- and cross-industry momentum spillovers separately for each type of momentum spillover in Section 4.3.1. Another advantage of news is its prompt updating, which helps us identify changes in linkages among firms in a timely manner. We also conduct a small exercise in Section 4.3.2 to investigate this aspect.

##### 4.3.1. Cross- and within-industry momentum spillovers

Unlike the US market, where shared-analyst momentum unifies various forms of momentum spillover effects, our findings in the Chinese stock market suggest that the momentum driven by news co-mention linkages, rather than by shared-analyst linkages, subsumes the predictability of other momentum spillover effects. This discrepancy could be attributed to differences in the information content of these linkages. One characteristic of Chinese analysts is that each tends to cover firms within a single industry. This might lead to a high degree of information overlap between shared-analyst linkages and industry linkages.<sup>32</sup> News, on the other hand, might reveal a broader range of economic linkages (i.e., a lower degree of overlap with industry links). To investigate this issue, we compute the percentage of within-industry links for each type of linkage, and Table 7 reports the time-series median of these percentages. The higher the percentage, the greater the proportion of linked firms that belong to the same industry. We consider two levels of CSRC classifications, three levels of CITIC classifications, and three levels of Shewan classifications to analyze the industry composition of these linkages.

Next, to investigate the information overlap among different linkage types, we plotted the correlation heatmap among various momentum

<sup>30</sup> We fill peer firm returns of null values with 0.

<sup>31</sup> Concept peer firm returns are excluded from the analysis due to their very short time series, spanning from August 2016 to 2020. Including concept returns would significantly shorten the sample time series.

<sup>32</sup> In China, analysts are often referred to as industry researchers, highlighting their specialization in specific industry classifications. In Appendix B, we demonstrate the industry research directions of the Research Division of China Securities Co., Ltd. (CSC) according to its recruitment advertisement for fresh graduates. The advertisement reveals that analysts within CSC are organized and assigned based on industry classifications.

**Table 6**

Fama–MacBeth regressions.

| Panel A: FM regressions based on union samples        |                 |                 |                 |                 |                 |                 |                 |                 |                   |                   |                 |                 |                 |                 |
|-------------------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------|-------------------|-----------------|-----------------|-----------------|-----------------|
|                                                       | 1               | 2               | 3               | 4               | 5               | 6               | 7               | 8               | 9                 | 10                | 11              | 12              | 13              | 14              |
| Sentence_3_Rtn                                        | 0.271<br>(5.53) |                 |                 |                 |                 |                 |                 | 0.265<br>(5.41) | 0.264<br>(5.38)   | 0.270<br>(5.51)   | 0.267<br>(5.45) | 0.267<br>(5.52) | 0.120<br>(3.16) | 0.257<br>(5.29) |
| Analyst_Rtn                                           |                 | 0.071<br>(4.32) |                 |                 |                 |                 |                 | 0.031<br>(1.57) |                   |                   |                 |                 |                 | 0.020<br>(1.31) |
| Industry_Rtn                                          |                 |                 | 0.040<br>(2.34) |                 |                 |                 |                 |                 | 0.019<br>(0.86)   |                   |                 |                 |                 | 0.007<br>(0.39) |
| Geographic_Rtn                                        |                 |                 |                 | 0.015<br>(1.59) |                 |                 |                 |                 |                   | 0.016<br>(1.68)   |                 |                 |                 | 0.013<br>(1.49) |
| Technology_Rtn                                        |                 |                 |                 |                 | 0.039<br>(2.57) |                 |                 |                 |                   |                   | 0.028<br>(1.44) |                 |                 | 0.019<br>(1.24) |
| Statistical_Rtn                                       |                 |                 |                 |                 |                 | 0.039<br>(1.64) |                 |                 |                   |                   |                 | 0.022<br>(0.75) |                 | 0.016<br>(0.56) |
| Concept_Rtn                                           |                 |                 |                 |                 |                 |                 | 0.036<br>(1.59) |                 |                   |                   |                 |                 | 0.035<br>(1.55) |                 |
| Control                                               | YES             | YES             | YES             | YES             | YES             | YES             | YES             | YES             | YES               | YES               | YES             | YES             | YES             | YES             |
| Avg. R Square                                         | 0.060           | 0.061           | 0.064           | 0.059           | 0.059           | 0.062           | 0.046           | 0.064           | 0.067             | 0.062             | 0.062           | 0.065           | 0.048           | 0.076           |
| Total Obs.                                            | 1 709 464       | 1 709 464       | 1 709 464       | 1 709 464       | 1 709 464       | 1 709 464       | 653 094         | 1 709 464       | 1 709 464         | 1 709 464         | 1 709 464       | 1 709 464       | 653 094         | 1 709 464       |
| Avg. Obs.                                             | 2226            | 2226            | 2226            | 2226            | 2226            | 2226            | 2877            | 2226            | 2226              | 2226              | 2226            | 2226            | 2877            | 2226            |
| Panel B: FM regressions based on intersection samples |                 |                 |                 |                 |                 |                 |                 |                 |                   |                   |                 |                 |                 |                 |
| Sentence_3_Rtn                                        | 0.234<br>(5.69) |                 |                 |                 |                 |                 |                 | 0.159<br>(5.13) | 0.230<br>(5.57)   | 0.233<br>(5.69)   | 0.229<br>(5.11) | 0.048<br>(3.77) | 0.112<br>(3.51) | 0.059<br>(2.10) |
| Analyst_Rtn                                           |                 | 0.081<br>(4.96) |                 |                 |                 |                 |                 | 0.026<br>(1.07) |                   |                   |                 |                 |                 | 0.022<br>(0.65) |
| Industry_Rtn                                          |                 |                 | 0.041<br>(2.36) |                 |                 |                 |                 |                 | −0.009<br>(−0.38) |                   |                 |                 |                 | 0.039<br>(1.25) |
| Geographic_Rtn                                        |                 |                 |                 | 0.015<br>(1.58) |                 |                 |                 |                 |                   | −0.001<br>(−0.11) |                 |                 |                 | 0.030<br>(1.91) |
| Technology_Rtn                                        |                 |                 |                 |                 | 0.037<br>(2.43) |                 |                 |                 |                   |                   | 0.021<br>(0.83) |                 |                 | 0.041<br>(1.94) |
| Statistical_Rtn                                       |                 |                 |                 |                 |                 | 0.079<br>(3.39) |                 |                 |                   |                   |                 | 0.100<br>(3.27) |                 | 0.017<br>(0.49) |
| Concept_Rtn                                           |                 |                 |                 |                 |                 |                 | 0.036<br>(1.59) |                 |                   |                   |                 |                 | 0.022<br>(0.74) |                 |
| Control                                               | YES             | YES             | YES             | YES             | YES             | YES             | YES             | YES             | YES               | YES               | YES             | YES             | YES             | YES             |
| Avg. R Square                                         | 0.088           | 0.064           | 0.064           | 0.059           | 0.079           | 0.058           | 0.046           | 0.086           | 0.096             | 0.090             | 0.125           | 0.070           | 0.067           | 0.131           |
| Total Obs.                                            | 503 829         | 988 653         | 1 694 481       | 1 707 853       | 750 982         | 1 456 040       | 653 094         | 305 452         | 501 611           | 503 511           | 232 484         | 441 002         | 205 109         | 106 708         |
| Avg. Obs.                                             | 1086            | 1287            | 2206            | 2224            | 978             | 1896            | 2877            | 658             | 1081              | 1085              | 501             | 950             | 904             | 230             |

This table presents the results of the [Fama and MacBeth \(1973\)](#) regressions. The dependent variable is the excess stock return in the next week, while the independent variable is the peer firm return for each type of economic linkage constructed in Section 2.2. The control variables include the firm size (taking logarithms), book-to-market ratio, and stock return in the past week. All independent variables are standardized with their cross-sectional means and standard deviations. The news co-mention momentum is based on *same\_sentence* type under the 3-month identification window. The industry momentum is based on the Shenwan-1 classification. The geographic momentum is conducted on the province level. We do not consider the customer momentum due to the low data quality. The sample period of news co-mention momentum is 2012–2020. The sample period of concept momentum is Aug. 2016–2020. The sample periods for other momentums are 2006–2020. We estimate the regressions based on two samples. Panel A uses the union set of samples, and peer firm returns of null values are filled with 0 (concept momentum samples are excluded from taking the union due to its very short time series). Panel B uses the intersection set of all samples of different peer firm returns. Columns 1–7 use each peer firm return alone as the dependent variable respectively. In columns 8–13, *Sentence\_3\_Rtn* is added to the regressions. In column 14, all peer firm returns except for *Concept\_Rtn* (due to the very short time series) are added to the regression. [Newey and West \(1987\)](#) adjusted *t*-statistics are shown in parentheses. For brevity, all coefficients are multiplied by 100.

**Table 7**

Percentages of within-industry linkages.

|                 | CSRC-1 | CSRC-2 | CITIC-1 | CITIC-2 | CITIC-3 | Shenwan-1 | Shenwan-2 | Shenwan-3 |
|-----------------|--------|--------|---------|---------|---------|-----------|-----------|-----------|
| News co-mention | 52.44  | 3.45   | 7.67    | 1.65    | 0.31    | 8.53      | 1.83      | 0.50      |
| Analyst         | 72.61  | 20.37  | 40.30   | 15.81   | 7.06    | 42.51     | 14.40     | 5.77      |
| Geographic      | 47.15  | 1.92   | 4.18    | 0.65    | 0.06    | 4.14      | 0.53      | 0.00      |
| Technology      | 82.18  | 7.75   | 9.52    | 3.55    | 1.72    | 9.79      | 3.15      | 1.33      |
| Statistical     | 57.89  | 3.73   | 5.24    | 2.23    | 1.07    | 5.40      | 1.87      | 0.83      |
| Concept         | 55.73  | 9.70   | 14.10   | 7.14    | 4.27    | 14.94     | 7.02      | 3.83      |

This table reports the time series median of the percentage of within-industry links for each linkage type under different industry classifications. The higher the percentage, the higher the overlap between that linkage and the industry linkage. We report the results of six types of linkages, including the news co-mention linkage, shared-analyst linkage, geographic linkage, technology linkage, statistical linkage, and concept linkage under two levels of CSRC classifications (CSRC-1, −2), three levels of CITIC classifications (CITIC-1, −2, −3), and three levels of Shewan classifications (Shenwan-1, −2, −3). The news co-mention linkage is based on *same\_sentence* type under the 3-month identification window. The geographic linkage is at the province level. The sample period of news co-mention linkage is 2012–2020. The sample period of concept linkage is Aug. 2016–2020. The sample periods for other linkages are 2006–2020.

factors used in the spanning tests, as shown in [Fig. 2](#). As expected, the analyst momentum factor is highly correlated with the industry momentum factor (the correlation coefficient is 0.84), indicating a high degree of information overlap between these two factors. The concept momentum factor also exhibits a high correlation with the

industry momentum factor (the correlation coefficient is 0.87), which can be attributed to the fact that many stock concepts are derived from industry classifications. In comparison, the correlation between *Sentence\_3* and the industry factor is moderate at 0.67, indicating that the short-term news factor incorporates a significant amount of

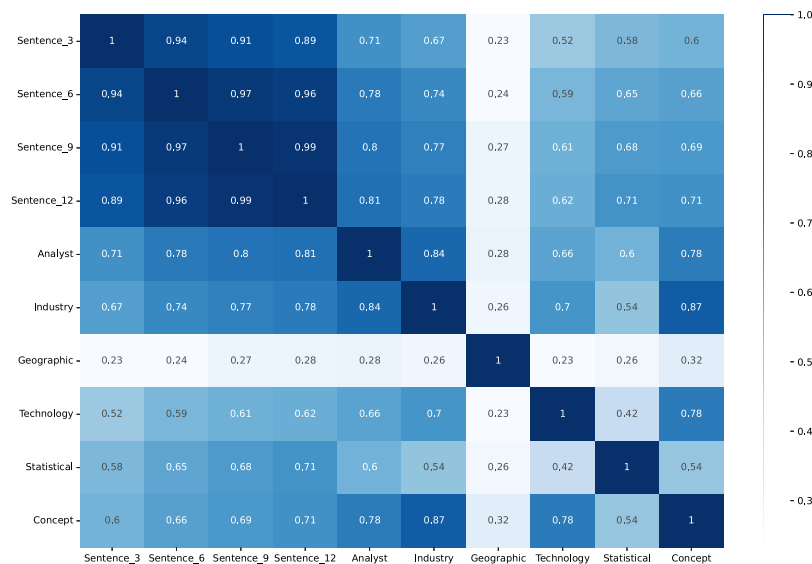


Fig. 2. Correlation among momentum spillover factors.

This figure is the heatmap of the correlation coefficients among various momentum spillover factors *MS*. The ten momentum spillover factors are *same\_sentence* type co-mention momentums under identification windows of 3-, 6-, 9-, 12-month, shared-analyst momentum, industry momentum (Shenwan-1), geographic momentum (province level), technology momentum, statistical momentum, and concept momentum. The construction of the *MS* factor is given in Section 4.1. We do not consider the customer momentum due to the low data quality. The sample period of co-mention momentum is 2012–2020. The sample period of concept momentum is Aug.2016–2020. The sample periods for other momentums are 2006–2020.

non-industry information. The geographical momentum factor has the lowest correlation with all other factors, all of which are below 0.3.

Overall, the analyst linkages have the highest degree of overlap with the industry linkages. The median percentages of analyst peer firms from the same industry are the highest for seven out of eight classification methods. For instance, under the CITIC-1 classification, the percentage of analyst linkage from the same industry is 40.30%, which is the highest among all linkage types. The concept linkage comes in second with a percentage of 14.10%. In comparison, the overlap percentage of the news co-mention linkage is 7.67%, indicating a lower degree of overlap compared to the analyst linkage. The results confirm that Chinese analysts tend to cover firms from the same industry, indicating that the shared-analyst linkage captures information that largely overlaps with the industry linkage.

For the news co-mention linkage, the degree of overlap with industry information is relatively low compared to other types of linkages. Specifically, it ranks as the second lowest, only above the geographic linkage, for the CSRC-1, CSRC-2, CITIC-2, CITIC-3, Shenwan-2, and Shenwan-3 classifications. It is the third lowest, following the geographic and statistical linkages, for the CITIC-1 and Shenwan-1 classifications. This further confirms that the news factor incorporates a significant amount of non-industry information.

Next, for each type of linkage, we decompose linked firms into cross-industry peers and within-industry peers, examining the two corresponding momentum spillover effects separately. Specifically, when analyzing the cross-industry effect, we consider only the peer firms from different industries than the focal firm. Conversely, when examining the within-industry effect, we focus solely on the peer firms from the same industry as the focal firm. For each type of linkage, we conduct a portfolio sorting analysis separately based on the returns of cross-industry and within-industry peer firms. This approach is meaningful because most previous studies have primarily focused on within-industry information transfer and momentum spillover. For example, Liu et al. (2022) specifically studied information transfer between peer firms, with the peer firms referring only to intra-industry peers. By exploring both within-industry and cross-industry effects, this paper provides a more comprehensive understanding of how information propagates among firms in the Chinese stock market.

Table 8 reports the long-short portfolio excess returns and CH-4 alphas for the news co-mention, analyst, geographic, technology, statistical, and concept momentum, separately considering cross-industry and within-industry links. For the news co-mention linkage, there is not much difference in the predictive power between cross-industry and within-industry peer return signals. The cross-industry news co-mention momentum yields an average excess return of 1.73% (t-statistic = 4.95), while the within-industry news co-mention momentum yields 1.76% (t-statistic = 3.92). From Panel B, both cross-industry and within-industry news co-mention momentum generate the same CH-4 adjusted alphas at 1.65% (t-statistics = 5.06 and 3.74, respectively) per month.

In contrast, for any other type of linkage, the within-industry momentum effect is stronger. For instance, the within-industry analyst momentum generates a CH-4 alpha of 0.75% (t-statistic = 2.34) per month, whereas the cross-industry analyst momentum produces a CH-4 alpha of 0.45% (t-statistic = 2.34) per month. Comparing this with the alpha of the shared-analyst momentum (0.85%, t-statistic = 2.97), it is evident that the predictive power primarily stems from within-industry information. Similar patterns are observed for statistical and concept linkages, which both exhibit a stronger within-industry momentum effect. For the geographic and technological linkages, only the within-industry effects are significant.

Overall, these results suggest that while other types of linkages show a higher degree of overlap with industry linkages (except for geographic linkages), news co-mention linkages capture a broader range of economic linkages. They incorporate both industry information and valuable non-industry linkage information, which contributes to their strong predictive power for future returns. This finding helps us understand why news co-mention momentum spillover effects tend to dominate and unify other types of momentum spillovers in the Chinese stock market.

#### 4.3.2. Speed of update

As previously mentioned, the strong predictive power and unifying effect of the news co-mention momentum can be attributed to two advantages of the news co-mention linkage: comprehensive information and prompt updates. Section 4.3.1 demonstrates that the news content is all-encompassing, incorporating both industry information and

**Table 8**  
Cross- and within-industry momentum spillovers: portfolio analysis.

| Panel A: Excess return of long-short portfolios |                 |                |                |                |                |                |
|-------------------------------------------------|-----------------|----------------|----------------|----------------|----------------|----------------|
|                                                 | News co-mention | Analyst        | Geographic     | Technology     | Statistical    | Concept        |
| Cross Industry                                  | 1.73<br>(4.95)  | 0.45<br>(2.44) | 0.10<br>(0.95) | 0.13<br>(0.83) | 0.89<br>(2.92) | 0.22<br>(0.71) |
| Within Industry                                 | 1.76<br>(3.92)  | 0.78<br>(3.20) | 0.43<br>(2.52) | 0.75<br>(3.19) | 0.94<br>(3.32) | 0.54<br>(1.61) |
| Panel A: CH-4 adjusted alphas                   |                 |                |                |                |                |                |
|                                                 | News co-mention | Analyst        | Geographic     | Technology     | Statistical    | Concept        |
| Cross Industry                                  | 1.65<br>(5.06)  | 0.45<br>(2.34) | 0.07<br>(0.59) | 0.12<br>(0.73) | 0.80<br>(2.26) | 0.16<br>(0.48) |
| Within Industry                                 | 1.65<br>(3.74)  | 0.75<br>(2.82) | 0.42<br>(2.33) | 0.79<br>(3.08) | 0.89<br>(2.79) | 0.43<br>(1.19) |

This table reports the long-short portfolio based on cross- and within-industry momentum spillovers for each linkage type. We consider five momentum spillover effects, including the news co-mention momentum, analyst momentum, geographic momentum, technology momentum, statistical momentum, and concept momentum. The news co-mention momentum is based on *same\_sentence* type under the 3-month identification window. The geographic momentum is at the province level. The industry classification we adopt is the CSRC-1 classification. For the cross-industry effect, when calculating the peer firm return, only peer firms from different industries from the focal firm are considered. On the contrary, for the within-industry effect, when calculating the peer firm return, only peer firms from the same industry as the focal firm are considered. At the end of each trading week, all sample stocks are sorted into quintiles according to their cross- and within-industry peer firm return, respectively. The long-short portfolio involves buying the highest group and selling the lowest group. The sample period of news co-mention momentum is 2012–2020. The sample period of concept momentum is Aug. 2016–2020. The sample periods for other momentums are 2006–2020. Panel A shows the excess returns of the long-short portfolios, while Panel B reports the CH-4 adjusted alphas. All returns alphas are converted to monthly using compound interest. Newey and West (1987) adjusted *t*-statistics are shown in parentheses.

valuable non-industry linkage information. From the portfolio analysis, we have observed that the predictive power of the news co-mention momentum decreases as the identification window lengthens, providing indirect evidence of the promptness of updates. In this subsection, we present additional evidence by monitoring the percentage change in various linkage networks over time. This analysis allows us to assess the dynamics and updates of these networks, providing further support for the timeliness and promptness of the news co-mention linkage.

We calculate the change rate of a given network matrix at week  $t$ , denoted as  $\%Change_t$ , to measure the speed of the linkage change in the week. Specifically:

$$\%Change_t = \frac{\sum_j \sum_i |M_{t(i,j)} - M_{t-1(i,j)}|}{\sum_j \sum_i M_{t-1(i,j)}} \times 100\%,$$

where  $M_t$  is the network matrix at week  $t$ , and  $M_{t(i,j)}$  is the element at row  $i$  and column  $j$  of the network matrix.

We then compute the weekly change rate time series for each linkage type. The summary statistics for the change rates of each linkage are reported in Table 9. The results show that the news co-mention matrix updates much faster than other types of linkages. Specifically, on average, there is a 16.07% change in co-mention linkages from one week to the next. This proportion is higher than the change rates for analyst linkages (3.61%), statistical linkages (10.53%), and concept linkages (1.27%). Furthermore, the change rates for industry, geographic, and technology linkages are much lower since their network matrices update on a yearly basis. The mean ratios for these linkages are almost zero, indicating very little change from one week to the next.

These results provide direct evidence that the news co-mention linkage updates more quickly compared to other economic linkages. This faster update speed suggests that the co-mention linkage method is more effective at capturing and identifying changes in linkages among firms in a timely manner.

## 5. Mechanism

In this section, we investigate the mechanism behind this news-based momentum spillover. Two main theories have been proposed in the literature to explain the cross-firm momentum anomaly. The first is the investors' limited attention theory, which has gained widespread

**Table 9**  
Summary statistics of the linkage change rate.

|                 | Mean   | Std  | Min   | Median | Max     |
|-----------------|--------|------|-------|--------|---------|
| News co-mention | 16.07% | 0.20 | 0.94% | 13.61% | 316.70% |
| Analyst         | 3.61%  | 0.03 | 0.11% | 2.76%  | 42.92%  |
| Industry        | 0.12%  | 0.01 | 0.00% | 0.00%  | 21.85%  |
| Geographic      | 0.10%  | 0.01 | 0.00% | 0.00%  | 7.43%   |
| Technology      | 0.64%  | 0.05 | 0.00% | 0.00%  | 42.09%  |
| Statistical     | 10.53% | 0.12 | 1.69% | 8.71%  | 110.17% |
| Concept         | 1.27%  | 0.08 | 0.00% | 0.48%  | 116.23% |

This table reports the summary statistics of the change rate of six economic linkages, including the news co-mention linkage, shared-analyst linkage, industry linkage, geographic linkage, technology linkage, statistical linkage, and concept linkage. The news co-mention linkage is based on *same\_sentence* type under the 3-month identification window. The industry linkage is based on the Shenwan-1 classification. The geographic linkage is at the province level. The change rate of a certain linkage type in one week is computed as below: subtract the network matrix last week from the matrix this week, then take the absolute value of all the elements of the difference matrix and make a summation, divided by the sum of all elements of the network matrix last week. The sample period of news co-mention linkage is 2012–2020. The sample period of concept linkage is Aug. 2016–2020. The sample period for other linkages is 2006–2020.

acceptance as an explanation for various types of cross-firm predictability.<sup>33</sup> According to this theory, gathering information about peer firms requires additional effort and attention from investors. As a result, investors may overlook or underestimate the importance of such information, leading to a lead-lag effect between the stock returns of peer firms and the focal firm. In recent years, a new theory based on behavioral psychology, termed the psychological barrier theory, was proposed by Huang et al. (2021) as an alternative explanation for the momentum spillover effect. This theory suggests that, due to the cognitive bias of anchoring, investors tend to react slowly to positive news from peer firms when the focal stock price is close to its 52-week high. This is because they believe that the stock price has already reached its peak and is unlikely to increase further. Similarly, investors also tend to respond slowly to negative news from peer firms when the

<sup>33</sup> In fact, most previous studies attribute the momentum spillover effect to investors' limited attention to news from peer firms. See Burt and Hrdlicka (2021) for a detailed list of these studies.

focal stock price is far from its 52-week high.<sup>34</sup> This anchoring behavior results in slow information diffusion and a lead-lag effect between the returns of peer firms and the focal firm. We will examine these two explanations respectively.

### 5.1. Limited attention

Since it is difficult to precisely quantify investors' attention, the literature often relies on indirect metrics to proxy limited attention. In particular, if the lead-lag effect in stock returns results from investors' inattention to information from peer firms, we would expect to observe a stronger predictive power of the news co-mention momentum when it is more challenging for investors to access information about peer firms<sup>35</sup>.

There are several methods to measure investors' attention. Typically, firms with greater analyst coverage, larger market capitalization, higher institutional holdings, and higher internet search volume are expected to attract more attention from investors (Da et al., 2011; Du et al., 2022b), and information about these firms is more readily available and accessible to investors. In this case, investors are less likely to overlook important information. Consequently, the stock price of the focal firm will respond more promptly to relevant information, thereby weakening the lead-lag effects between peer firms. Furthermore, the complexity of the network can also serve as a measure to assess investors' attention. According to research by Zhu (2019), the predictability of cross-firm momentum diminishes among firms with more intricate linkage networks. This is because it becomes more challenging for investors to understand and identify the peers of firms within a complicated network. The fact that a complex environment may lead agents to overlook the informational content is also discussed in theoretical studies, such as Mondria et al. (2022). Finally, for less opaque firms, the speed of information diffusion tends to be faster, meaning that investors can obtain information about these firms more easily, which in turn reduces the cross-firm momentum effect among these firms.

We utilize all the aforementioned proxies to measure investor attention in order to reach a robust conclusion. We employ the total number of analysts covering the firm (*#Analysts*), and the total number of analyst reports about the firm (*#Reports*) in the year to capture analyst attention. Additionally, we use the log float value of the firm to measure its size. The institutional holding ratio (*%Institution*) is computed as the proportion of shares held by institutional investors to the total shares of the listed firm. The internet search volume is the Baidu search volume index (*SVI*) which can be obtained from CNRDS.<sup>35</sup> For network complexity, we follow Ali and Hirshleifer (2020) and use degree centrality (i.e., the number of peer firms, denoted as *#Peers*) as the proxy variable. The opacity indicator of a firm, denoted as *OPACITY*, is computed as the past three-year sum of the absolute values of annual discretionary accruals (DISACC) (Hutton et al., 2009).

At the end of each trading week, we create dummy variables for each of the seven proxy variables. Each of the dummy variables takes a value of one if the corresponding variable value for a focal firm is higher than the median value of the sample, and zero otherwise.

<sup>34</sup> In a different context, Hung et al. (2022) linked the aggregate 52-week high to limited attention. They argued that a higher market-level 52-week high is associated with a large amount of good firm-specific information in the market, which, in turn, may lead to overwhelmed investors and subsequent underreactions.

<sup>35</sup> In Da et al. (2011), the search keywords for US stocks are only the tickers of stocks (like AAPL for Apple). However, in China, our search keywords include not only the stock code but also the Chinese abbreviation and the full name of the firm. This is because, in China, each stock is given a unique six-digit code which is difficult for most investors to remember. Typically, investors prefer searching by the Chinese abbreviation name rather than the digit code of the firm.

For example, the dummy variable based on the number of analysts *Dummy#Analysts* equals one if the number of analysts of one firm is higher than the sample median, and 0 otherwise. For each of the dummy variables, we add an interaction term between it and the news co-mention peer firm return *Sentence\_3\_Rtn* to the Fama-MacBeth regression specified in Section 4.2.

Table 10 presents the results of the Fama-MacBeth regressions with the interaction terms. Columns 1–5 show that the coefficient of the interaction terms *Dummy#Analysts*  $\times$  *Sentence\_3\_Rtn*, *Dummy#Reports*  $\times$  *Sentence\_3\_Rtn*, *DummyValues*  $\times$  *Sentence\_3\_Rtn*, *Dummy%Institution*  $\times$  *Sentence\_3\_Rtn*, and *Dummy%SVI*  $\times$  *Sentence\_3\_Rtn* are all significantly negative. This suggests that the predictive power of the news co-mention momentum is weaker among firms with higher analyst coverage, more analyst reports, larger float values, and higher institutional holder proportions. From columns 6–7, the interaction terms *Dummy#Peers*  $\times$  *Sentence\_3\_Rtn* and *DummyOPACITY*  $\times$  *Sentence\_3\_Rtn* are both positive and significant. This suggests that the news co-mention momentum is stronger among firms with a higher network degree and firms that are more opaque (whose information is less transparent).

We also perform a portfolio analysis by dividing all sample stocks into two groups (a high group for dummy = 1 and a low group for dummy = 0) based on each of the seven dummy variables created earlier. Subsequently, we sort all stocks within each group into quintiles based on their values of *Sentence\_3\_Rtn*. For each group, we construct a long-short portfolio by purchasing stocks from the highest quintile and selling stocks from the lowest quintile.

Table 11 reports the results of the portfolio grouping and sorting. From columns 1 to 5, the long-short portfolio exhibits higher mean excess returns and alpha for the group with fewer analysts, fewer reports, smaller size, and lower institutional holder proportions. These differences are statistically significant, except for the institutional holding one. From columns 6 to 7, the long-short portfolio exhibits higher mean excess returns and alpha for the group with a higher network degree and a higher degree of opacity.

Overall, both the Fama-MacBeth regressions and the portfolio analysis support the limited attention theory.

### 5.2. Psychological barrier

To examine the psychological barrier theory, we adopt the method used in Huang et al. (2021) and define the nearness to the 52-week high as the ratio of the closing price at the end of the trading week to the highest daily closing price observed over the past 12 months.

Then, we construct 5  $\times$  5 double-sorting equal-weighted portfolios independently based on the nearness to the 52-week high (denoted as *PRC* later) and the news co-mention peer firm return (*Sentence\_3\_Rtn*, denoted as *CR* in Table 12). If the psychological barrier theory holds, we would expect to observe increasing portfolio returns as we move up the ranks of *PRC*, and the long-short portfolio should exhibit highly significant positive returns.

Table 12 reports the mean excess returns and CH-4 adjusted alphas of the double-sorting portfolios. In contrast to the findings of Huang et al. (2021), who examined the US stock market, we do not observe an increasing trend in portfolio alpha with the ranks of *PRC* within each *CR* quintile. This result indicates that the psychological barrier theory may not explain the momentum spillover effect in the Chinese stock market, possibly because the 52-week high effect itself is not empirically supported there. As documented in Hou et al. (2023), the 52-week high effect in China only leads to a modest adjusted alpha of 0.32%, which is not statistically significant. Actually, Zhang et al. (2019) found evidence of a 52-week low effect (i.e., stocks with prices near their 52-week lows tend to exhibit higher future returns) in the Chinese stock market, which is the opposite of the traditional 52-week high effect documented by George and Hwang (2004).

**Table 10**  
Limited attention and FM regressions.

|                                           | 1                 | 2                 | 3                 | 4                 | 5                 | 6                 | 7                 |
|-------------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sentence_3_Rtn                            | 0.040<br>(6.19)   | 0.042<br>(6.05)   | 0.054<br>(6.17)   | 0.041<br>(6.14)   | 0.054<br>(6.18)   | 0.022<br>(5.04)   | 0.004<br>(1.11)   |
| Dummy#Analysts $\times$ Sentence_3_Rtn    | −0.014<br>(−2.13) |                   |                   |                   |                   |                   |                   |
| Dummy#Reports $\times$ Sentence_3_Rtn     |                   | −0.024<br>(−3.17) |                   |                   |                   |                   |                   |
| DummyValues $\times$ Sentence_3_Rtn       |                   |                   | −0.052<br>(−4.97) |                   |                   |                   |                   |
| Dummy%Institution $\times$ Sentence_3_Rtn |                   |                   |                   | −0.013<br>(−2.25) |                   |                   |                   |
| DummySVI $\times$ Sentence_3_Rtn          |                   |                   |                   |                   | −0.039<br>(−4.05) |                   |                   |
| Dummy#Peers $\times$ Sentence_3_Rtn       |                   |                   |                   |                   |                   | 0.033<br>(3.87)   |                   |
| DummyOPACITY $\times$ Sentence_3_Rtn      |                   |                   |                   |                   |                   |                   | 0.041<br>(4.75)   |
| Intercept                                 | −0.032<br>(−9.69) | −0.032<br>(−9.35) | 0.007<br>(1.94)   | −0.008<br>(−2.99) | 0.036<br>(10.44)  | −0.009<br>(−4.04) | −0.007<br>(−1.91) |
| Control                                   | YES               | YES               | YES               | YES               | YES               | YES               | YES               |
| Avg. R Square                             | 0.091             | 0.091             | 0.089             | 0.088             | 0.092             | 0.093             | 0.088             |
| Total Obs.                                | 507 665           | 507 665           | 507 665           | 507 665           | 507 665           | 507 665           | 507 665           |
| Avg. Obs.                                 | 1094              | 1094              | 1094              | 1094              | 1094              | 1094              | 1094              |

This table reports the results of Fama–MacBeth regressions, where interaction terms between the news co-mention peer firm return and different limited attention dummy proxies are included. The news co-mention momentum is based on *same\_sentence* type under the 3-month identification window. The dependent variable is the stock excess return in the next week. The independent variables include the interaction term between the news co-mention peer firm return *Sentence\_3\_Rtn* and the seven dummy variables. The seven proxy variables for limited attention are the number of analysts (*#Analysts*), the number of reports (*#Reports*), the float value (*Values*), the proportion of institutional holders (*%Institution*), the Baidu search volume index (*SVI*), the network complexity (*#Peers*), and the opacity indicator (*OPACITY*) (Hutton et al., 2009). We then define corresponding dummy variables for these seven proxy variables at the end of each trading week. For each dummy, we let it be one if the corresponding variable value of a focal firm is higher than the sample median, and zero otherwise. For example, *Dummy#Analysts* equals one if the number of analysts of one firm is higher than the cross-sectional sample median, else zero. The sample period is 2012–2020. The control variables include the firm size (taking logarithms), book-to-market ratio, and stock return in the past week. All independent variables are standardized with their cross-sectional means and standard deviations. Newey and West (1987) adjusted *t*-statistics are shown in parentheses.

**Table 11**  
Limited attention and portfolio sorting.

| Panel A: Excess mean returns |                  |                  |                  |                  |                  |                |                |
|------------------------------|------------------|------------------|------------------|------------------|------------------|----------------|----------------|
|                              | # Analysts       | # Reports        | Float values     | % Institutional  | SVI              | # Peer firms   | OPACITY        |
| Lower group                  | 2.44<br>(5.33)   | 2.60<br>(5.51)   | 3.00<br>(5.58)   | 2.06<br>(4.82)   | 2.43<br>(4.94)   | 1.29<br>(5.06) | 0.57<br>(2.50) |
| Higher group                 | 1.37<br>(4.54)   | 1.25<br>(4.21)   | 0.70<br>(2.49)   | 1.64<br>(5.15)   | 1.42<br>(4.04)   | 2.56<br>(4.10) | 3.16<br>(5.34) |
| Higher-Lower                 | −1.05<br>(−3.41) | −1.32<br>(−3.92) | −2.25<br>(−4.58) | −0.41<br>(−1.40) | −0.99<br>(−2.17) | 1.25<br>(2.24) | 2.58<br>(4.78) |
| Panel B: CH-4 alphas         |                  |                  |                  |                  |                  |                |                |
|                              | # Analysts       | # Reports        | Float values     | % Institutional  | SVI              | # Peer firms   | OPACITY        |
| Lower group                  | 2.36<br>(5.41)   | 2.50<br>(5.50)   | 2.82<br>(5.63)   | 2.02<br>(4.74)   | 2.23<br>(4.94)   | 1.28<br>(5.02) | 0.58<br>(2.36) |
| Higher group                 | 1.31<br>(4.20)   | 1.23<br>(4.05)   | 0.70<br>(2.32)   | 1.53<br>(4.84)   | 1.46<br>(3.97)   | 2.41<br>(4.04) | 3.01<br>(5.55) |
| Higher-Lower                 | −1.02<br>(−3.42) | −1.24<br>(−3.83) | −2.08<br>(−4.51) | −0.48<br>(−1.53) | −0.76<br>(−1.81) | 1.11<br>(2.11) | 2.42<br>(5.11) |

This table reports the portfolio sorting results for different attention groups. The news co-mention momentum is based on *same\_sentence* type under the 3-month identification window. At the end of each trading week, we group all sample stock into two groups according to the seven proxy variables for limited attention. The seven proxy variables for limited attention are the number of analysts (*#Analysts*), the number of reports (*#Reports*), the float value (*Values*), the proportion of institutional holders (*%Institution*), the Baidu search volume index (*SVI*), the network complexity (*#Peers*), and the opacity indicator (*OPACITY*) (Hutton et al., 2009). For each proxy variable, the group with variables larger than the median value is the higher group, while the group with variables smaller than the median is the lower group. We then conduct the portfolio sorting analysis according to *Sentence\_3\_Rtn* for the two groups respectively. The long-short portfolio of the higher group involves buying the highest quintile and selling the lowest quintile. The sample period is 2012–2020. Panel A shows the excess returns of the long-short portfolios, while Panel B reports the CH-4 adjusted alphas. All returns alphas are converted to monthly using compound interest. Newey and West (1987) adjusted *t*-statistics are shown in parentheses. Return/alpha spreads with *t*-statistics higher/lower than 2.00/−2.00 are highlighted in bold.

**Table 12**  
Psychological barrier and news co-mention momentum.

| Panel A: Excess mean returns  |                  |                  |                  |                  |                |
|-------------------------------|------------------|------------------|------------------|------------------|----------------|
|                               | CR1              | CR2              | CR3              | CR4              | CR5            |
| PRC1                          | 0.43<br>(0.40)   | 1.11<br>(1.08)   | 0.99<br>(1.03)   | 1.20<br>(1.23)   | 0.53<br>(0.55) |
| PRC2                          | 0.55<br>(0.55)   | 0.83<br>(0.94)   | 1.09<br>(1.17)   | 0.49<br>(0.55)   | 0.92<br>(1.07) |
| PRC3                          | 0.39<br>(0.46)   | 0.74<br>(0.81)   | 0.74<br>(0.80)   | 0.97<br>(1.12)   | 0.49<br>(0.59) |
| PRC4                          | 0.24<br>(0.24)   | 1.36<br>(1.50)   | 1.03<br>(1.18)   | 0.39<br>(0.44)   | 0.38<br>(0.47) |
| PRC5                          | 0.72<br>(0.61)   | 1.04<br>(0.93)   | 0.82<br>(0.80)   | −0.08<br>(−0.09) | 1.91<br>(1.73) |
| PRC5- PRC1                    | 0.25<br>(0.29)   | −0.07<br>(−0.07) | −0.16<br>(−0.20) | −1.27<br>(−1.68) | 1.38<br>(1.39) |
| Port.55-Port.11               |                  |                  |                  | 1.48<br>(1.57)   |                |
| Panel B: CH-4 adjusted alphas |                  |                  |                  |                  |                |
|                               | CR1              | CR2              | CR3              | CR4              | CR5            |
| PRC1                          | −0.08<br>(−0.08) | 0.57<br>(0.54)   | 0.39<br>(0.41)   | 0.80<br>(0.79)   | 0.00<br>(0.00) |
| PRC2                          | −0.05<br>(−0.05) | 0.17<br>(0.18)   | 0.68<br>(0.75)   | 0.03<br>(0.04)   | 0.38<br>(0.44) |
| PRC3                          | 0.23<br>(0.27)   | 0.30<br>(0.34)   | 0.47<br>(0.51)   | 0.75<br>(0.87)   | 0.31<br>(0.39) |
| PRC4                          | 0.10<br>(0.11)   | 1.05<br>(1.16)   | 0.57<br>(0.69)   | 0.38<br>(0.43)   | 0.16<br>(0.19) |
| PRC5                          | 1.01<br>(0.91)   | 1.06<br>(0.98)   | 0.64<br>(0.62)   | −0.13<br>(−0.14) | 1.75<br>(1.70) |
| PRC5- PRC1                    | 1.05<br>(1.21)   | 0.49<br>(0.48)   | 0.25<br>(0.32)   | −0.92<br>(−1.17) | 1.74<br>(1.98) |
| Port.55-Port.11               |                  |                  |                  | 1.83<br>(2.04)   |                |

This table reports the double sorting performance according to the nearness to the 52-week high (*PRC*) and the news co-mention peer firm return (denoted as *CR* in the table). The news co-mention momentum is based on *same\_sentence* type under the 3-month identification window. Following Huang et al. (2021), at the end of each trading week, all sample stocks are independently sorted into  $5 \times 5$  portfolios based on *CR* and *PRC*. The portfolios are held for one week and rebalanced weekly. Stocks are equal-weighted within each group. We also present the differences in returns between the corner portfolios. For example, Port.55 denotes the portfolio within the CR5 and PRC5 group, and Port.11 denotes the portfolio within the CR1 and PRC1 group. The sample period is 2012–2020. Panel A shows the excess returns of the long–short portfolios, while Panel B reports the CH-4 adjusted alphas. All returns alphas are converted to monthly through compound interest. Newey and West (1987) adjusted *t*-statistics are shown in parentheses. Returns/alphas of long–short portfolios with *t*-statistics higher than 2.00 are highlighted in bold.

## 6. Further analysis and robustness checks

### 6.1. Longer investment horizons

In the previous portfolio sorting analysis, we held the portfolio for one week and performed weekly rebalancing. In this subsection, we extend the analysis to examine the predictive power of the news co-mention momentum over longer investment horizons, including holding periods of 2, 3, 4, 8, 12, 24, and 36 weeks. To address the issue of inconsistent rebalancing frequency (which remains weekly) and holding period, we adopt the overlapping portfolio method, as described in Jegadeesh and Titman (1993) and Eisdorfer et al. (2022). We calculate the equal-weighted average of these overlapping portfolios. For instance, with a 2-week holding period, at the end of each trading week, we allocate only half of the total position to construct the portfolio based on the strategy for that week. The portfolio is then held for 2 weeks. In the following week, we use the other half of the total position to construct the portfolio for the next week.

Table 13 shows the performance of long–short portfolios with longer holding periods for different momentum spillover effects. Generally, the predictive power of each cross-firm momentum decreases as the holding period increases. For the news co-mention momentum, as the holding period increases from 1-week to 2-weeks and then to 3-weeks, the long–short mean excess return decreases from 1.94% (*t*-statistic = 5.33) to 1.56% (*t*-statistic = 4.95) and 1.18% (*t*-statistic = 4.36) respectively. The noticeable decrease in the strength of the news co-mention momentum under longer investment horizons can be attributed to the fast update of the news co-mention linkage. Peer firms identified through news co-mention are time-sensitive, and their relationships may only be valid in the short term. Therefore, investment strategies based on news co-mention momentum should be executed within a short-term timeframe. However, linkages such as those shared by analysts, industries, and concepts typically remain relevant and effective over longer terms, leading to a more gradual decrease in the strength of the corresponding momentum spillover effects. Despite this, the news co-mention momentum strategy continues to outperform other momentum spillover effects across most investment horizons, except for the 4-week and 8-week holding periods. However, it should be noted that the dominance of the news co-mention momentum diminishes as the investment horizon lengthens, due to the fast-update nature of the news co-mention linkage.

### 6.2. Heterogeneity of momentum spillover effects

In this subsection, we examine the heterogeneity of momentum spillover effects, starting with ownership differences. State-owned enterprises (SOEs) play a critical role in shaping market dynamics and contributing to the overall economy. SOEs differ from non-state-owned enterprises (non-SOEs) due to their dual considerations of corporate economic performance and political objectives (Jiang and Kim, 2020; Leippold et al., 2022). These factors often influence the stock prices of SOEs. We conduct separate portfolio analyses for SOEs and non-SOEs. At the end of each trading week, we divide the sample stocks into two groups: state-owned and non-state-owned enterprises. For each linkage type, we then perform separate portfolio sorting analyses for each group.

Panel A of Table 14 reports the differences in momentum spillover effects between SOEs and non-SOEs. Interestingly, among the various momentum spillover effects examined, only the news co-mention momentum demonstrates a notable discrepancy based on ownership. Specifically, among non-SOEs, the news co-mention momentum generates a significant long–short return of 2.48% (*t*-statistic = 5.90) per month. In contrast, among SOEs, it produces a relatively lower long–short return of 0.73% (*t*-statistic = 2.81) per month. The return spread in long–short returns from the news co-mention momentum between non-SOEs and SOEs is 1.75% (*t*-statistic = 5.23), which is both statistically and economically significant. This disparity suggests that the impact of news co-mentions on stock returns differs significantly between SOEs and non-SOEs. The observed results may be due to media bias. Given that SOEs in China are politically related and often have political objectives (Jiang and Kim, 2020 and Schweizer et al., 2020), it is plausible that news co-mentioning about SOEs may be less precise in capturing peer firm relationships compared to non-SOEs.<sup>36</sup> Unlike the news co-mention momentum, the differences in returns due to ownership between non-SOEs and SOEs are not statistically significant for other momentum spillovers.

We then conduct further heterogeneity analysis based on a set of other firm-level variables. Specifically, we partition all sample stocks

<sup>36</sup> In China, SOEs often have closer ties to the government and are subject to more government oversight compared to non-state-owned enterprises. The government may strategically use media outlets for economic and political purposes, leading to potential biases in news coverage.

**Table 13**  
Momentum spillovers over longer investment horizons.

| Panel A: Excess returns of long-short portfolios    |                |                |                |                |                |                |                |
|-----------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                                                     | 2-week         | 3-week         | 4-week         | 8-week         | 12-week        | 24-week        | 36-week        |
| News co-mention                                     | 1.55<br>(5.24) | 1.18<br>(4.74) | 0.87<br>(4.78) | 0.42<br>(4.20) | 0.27<br>(3.20) | 0.19<br>(3.29) | 0.18<br>(3.63) |
| Analyst                                             | 1.03<br>(5.63) | 0.86<br>(5.47) | 0.80<br>(5.93) | 0.43<br>(4.42) | 0.26<br>(3.22) | 0.16<br>(2.58) | 0.18<br>(3.13) |
| Industry                                            | 0.73<br>(4.16) | 0.62<br>(4.40) | 0.54<br>(4.28) | 0.34<br>(3.59) | 0.22<br>(2.69) | 0.13<br>(2.23) | 0.11<br>(1.88) |
| Geographic                                          | 0.41<br>(5.05) | 0.30<br>(4.43) | 0.26<br>(4.31) | 0.12<br>(2.96) | 0.08<br>(2.05) | 0.05<br>(1.80) | 0.07<br>(2.59) |
| Technology                                          | 0.50<br>(3.08) | 0.34<br>(2.47) | 0.27<br>(2.30) | 0.20<br>(2.22) | 0.14<br>(1.84) | 0.13<br>(2.37) | 0.12<br>(2.30) |
| Statistical                                         | 1.32<br>(5.22) | 1.10<br>(4.83) | 0.90<br>(4.48) | 0.51<br>(3.24) | 0.25<br>(1.91) | 0.03<br>(0.27) | 0.14<br>(1.79) |
| Concept                                             | 0.65<br>(2.56) | 0.68<br>(3.36) | 0.54<br>(2.66) | 0.32<br>(2.30) | 0.19<br>(1.73) | 0.17<br>(2.22) | 0.19<br>(3.13) |
| Panel B: CH-4 adjusted alphas long-short portfolios |                |                |                |                |                |                |                |
|                                                     | 2-week         | 3-week         | 4-week         | 8-week         | 12-week        | 24-week        | 36-week        |
| News co-mention                                     | 1.56<br>(4.95) | 1.18<br>(4.36) | 0.90<br>(4.36) | 0.42<br>(4.19) | 0.27<br>(3.21) | 0.18<br>(3.35) | 0.19<br>(3.69) |
| Analyst                                             | 1.05<br>(5.29) | 0.86<br>(5.09) | 0.81<br>(5.76) | 0.42<br>(4.02) | 0.22<br>(2.65) | 0.10<br>(1.73) | 0.14<br>(2.47) |
| Industry                                            | 0.76<br>(4.00) | 0.65<br>(4.26) | 0.58<br>(4.36) | 0.32<br>(3.20) | 0.19<br>(2.33) | 0.08<br>(1.42) | 0.07<br>(1.26) |
| Geographic                                          | 0.42<br>(4.95) | 0.30<br>(4.27) | 0.27<br>(4.29) | 0.12<br>(2.74) | 0.07<br>(1.72) | 0.04<br>(1.35) | 0.05<br>(1.93) |
| Technology                                          | 0.53<br>(3.05) | 0.34<br>(2.36) | 0.28<br>(2.25) | 0.17<br>(1.89) | 0.12<br>(1.49) | 0.09<br>(1.66) | 0.08<br>(1.61) |
| Statistical                                         | 1.36<br>(4.73) | 1.14<br>(4.39) | 0.97<br>(4.37) | 0.53<br>(3.09) | 0.27<br>(2.06) | 0.00<br>(0.00) | 0.10<br>(1.36) |
| Concept                                             | 0.58<br>(2.20) | 0.66<br>(2.98) | 0.55<br>(2.48) | 0.34<br>(2.30) | 0.19<br>(1.70) | 0.15<br>(1.87) | 0.17<br>(2.96) |

This table reports the long-short returns and alphas of the news co-mention momentum, analyst momentum, industry momentum, geographic momentum, technology momentum, statistical momentum, and concept momentum over longer investment horizons. The news co-mention momentum is based on *same\_sentence* type under the 3-month identification window. The industry momentum is based on the Shenwan-1 classification. The geographic momentum is at the province level. We convert the holding period from 1-week to 2-, 3-, 4-, 8-, 12-, 24-, and 36-week. We follow the method in Jegadeesh and Titman (1993) and Eisdorfer et al. (2022) to have overlapping portfolios. The sample period of news co-mention momentum is 2012–2020. The sample period of concept momentum is Aug. 2016–2020. The sample periods for other momentums are 2006–2020. We report the equal-weighted average of these overlapping portfolios. Panel A shows the excess returns of portfolios, while Panel B shows the intercepts of the regression of the returns on CH-4 factors (Liu et al., 2019) (market, size, value, abnormal turnover rate). All returns and alphas are converted into monthly. Newey and West (1987) adjusted *t*-statistics are shown in parentheses.

into higher and lower groups based on three indicators: firm size, firm establishment age, and weekly turnover rate. Within each group, we analyze the cross-firm momentum driven by different linkages.

Table 14 shows that among various momentum spillover effects, the news co-mention momentum displays the most pronounced heterogeneity. It is significantly stronger among firms with lower market capitalization, shorter establishment ages, and lower turnover rates. This finding is consistent with the underlying limited attention mechanism suggested by prior research.

### 6.3. News sentiment

In this subsection, we investigate the impact of news sentiment on the news co-mention momentum effect. We adopted the methodology outlined by Jiang et al. (2019) and utilized the Chinese sentiment dictionary proposed by Jiang et al. (2021) to assign each news article a positive or negative label. Each article was scored based on the count of positive and negative words from the sentiment dictionary. Words modified by degree enhancers (such as ‘very’, ‘extremely’, and ‘super’) or ending with an exclamation mark were assigned a higher sentiment weight. An article was classified as positive if its positive score exceeded its negative score, and vice versa. In total, we labeled 740,544 news articles as positive and 243,889 as negative.

Subsequently, we analyze the news co-mention momentum separately based on these news articles with sentiment labels. Table 15 details the long-short portfolio performances for both positive and negative news co-mention momentum across various identification windows. Our findings indicate that news co-mention momentum is robust to sentiment; using either positive or negative news alone yields significantly positive returns and alphas. Notably, positive news corresponds to stronger anomaly returns, which is consistent with the results from Stambaugh et al. (2012) who documented that anomalies in general are stronger following high levels of sentiment.

### 6.4. News co-mention momentum across different news categories

In this subsection, we employ a more fine-grained analysis when investigating the news co-mention momentum effect. In particular, we separately analyze news co-mention momentum based on the 12 different categories from Table 1. The results are shown in Table 16.

Panel A reports the long-short mean returns and CH-4 alphas of the news co-mention momentum for each label. We find that most news categories individually generate a significant momentum spillover effect. Only 4 out of 12 labels fail to generate significantly positive returns and alphas individually. Moreover, the momentum spillover based on news from Label 11, Re-financing, is the strongest among

**Table 14**  
Heterogeneity of momentum spillover effects.

| Panel A: Group variable: SOE/NonSOE      |                         |                         |                  |                       |                  |                  |                  |
|------------------------------------------|-------------------------|-------------------------|------------------|-----------------------|------------------|------------------|------------------|
|                                          | News-mention            | Analyst                 | Industry         | Geographic            | Technology       | Statistical      | Concept          |
| NonSOE                                   | 2.48<br>(5.90)          | 0.82<br>(3.45)          | 0.59<br>(2.56)   | 0.34<br>(2.82)        | 0.28<br>(1.17)   | 1.29<br>(4.29)   | 0.60<br>(1.68)   |
| SOE                                      | 0.73<br>(2.81)          | 0.81<br>(3.01)          | 0.83<br>(3.57)   | 0.30<br>(2.03)        | 0.66<br>(3.10)   | 1.20<br>(3.36)   | 0.94<br>(2.87)   |
| NonSOE-SOE                               | <b>1.73</b><br>(5.23)   | 0.01<br>(0.05)          | −0.24<br>(−1.31) | 0.04<br>(0.27)        | −0.38<br>(−1.56) | 0.09<br>(0.39)   | −0.34<br>(−1.17) |
| Panel B: Group variable: total size      |                         |                         |                  |                       |                  |                  |                  |
|                                          | News-mention            | Analyst                 | Industry         | Geographic            | Technology       | Statistical      | Concept          |
| Lower group                              | 0.68<br>(5.20)          | 0.27<br>(3.84)          | 0.19<br>(2.85)   | 0.10<br>(2.76)        | 0.19<br>(2.67)   | 0.28<br>(3.66)   | 0.17<br>(1.85)   |
| Higher group                             | 0.24<br>(3.20)          | 0.22<br>(2.19)          | 0.19<br>(2.07)   | 0.08<br>(2.39)        | 0.13<br>(1.59)   | 0.24<br>(1.98)   | 0.13<br>(1.31)   |
| Higher-lower                             | <b>−0.44</b><br>(−3.69) | −0.05<br>(−0.70)        | 0.00<br>(0.07)   | −0.02<br>(−0.42)      | −0.06<br>(−0.96) | −0.04<br>(−0.42) | −0.03<br>(−0.46) |
| Panel C: Group variable: firm age        |                         |                         |                  |                       |                  |                  |                  |
|                                          | News-mention            | Analyst                 | Industry         | Geographic            | Technology       | Statistical      | Concept          |
| Lower group                              | 0.65<br>(5.08)          | 0.31<br>(3.47)          | 0.22<br>(2.70)   | 0.08<br>(2.66)        | 0.16<br>(1.99)   | 0.44<br>(3.94)   | 0.20<br>(2.12)   |
| Higher group                             | 0.30<br>(4.40)          | 0.22<br>(2.57)          | 0.20<br>(2.59)   | 0.10<br>(2.84)        | 0.13<br>(2.02)   | 0.40<br>(3.85)   | 0.19<br>(2.12)   |
| Higher-lower                             | <b>−0.35</b><br>(−3.18) | −0.09<br>(−1.60)        | −0.03<br>(−0.58) | 0.02<br>(0.47)        | −0.03<br>(−0.50) | −0.04<br>(−1.03) | −0.01<br>(−0.19) |
| Panel D: Group variable: weekly turnover |                         |                         |                  |                       |                  |                  |                  |
|                                          | News-mention            | Analyst                 | Industry         | Geographic            | Technology       | Statistical      | Concept          |
| Lower group                              | 0.77<br>(5.71)          | 0.38<br>(4.92)          | 0.30<br>(4.28)   | 0.05<br>(1.73)        | 0.18<br>(3.08)   | 0.45<br>(4.06)   | 0.25<br>(4.16)   |
| Higher group                             | 0.20<br>(2.83)          | 0.20<br>(2.17)          | 0.20<br>(2.24)   | 0.16<br>(3.85)        | 0.19<br>(2.14)   | 0.48<br>(4.51)   | 0.22<br>(1.87)   |
| Higher-lower                             | <b>−0.57</b><br>(−4.42) | <b>−0.18</b><br>(−2.67) | −0.10<br>(−1.74) | <b>0.10</b><br>(2.51) | 0.01<br>(0.15)   | 0.04<br>(0.53)   | −0.03<br>(−0.33) |

This table reports the heterogeneity of different momentum spillover effects. The news co-mention momentum is based on *same\_sentence* type under the 3-month identification window. The industry momentum is based on the Shenwan-1 classification. The geographic momentum is at the province level. Panel A shows the differences in momentum spillover effects between SOEs and non-SOEs; while in Panel B–D, the grouping variables include firm size, firm age, and weekly turnover rate. At the end of each trading week, we divide the sample stocks into the lower/SOE group and higher/non-SOE group according to the nature of shareholder type or median of the grouping variable. Then within each sample group, we sort all stocks into quintiles according to the peer firm returns based on each linkage type. The long-short portfolio is buying the highest quintile and selling the lowest quintile. Higher/non-SOE - lower/SOE indicates taking the difference of the time series long-short returns and alphas between the two groups. Within each quintile group, the stocks are equally weighted. All portfolios are held for one week and are rebalanced weekly. The sample period of news co-mention momentum is 2012–2020. The sample period of concept momentum is Aug. 2016–2020. The sample periods for other momentums are 2006–2020. All returns and alphas are converted into monthly. Newey and West (1987) adjusted *t*-statistics are shown in parentheses. Return spreads with *t*-statistics greater than 2.00 are highlighted in bold.

all labels. We carefully examined the news articles where “re-finance” links were identified. Examples are provided in Table C.1 of Appendix D. These articles show that “re-finance” links capture relationships such as underwriting, joint underwriting, and shared investments—all of which are important channels for risk spillovers. For instance, investors often view issuers and underwriters as linked by credibility; thus, financial shocks to an underwriter (e.g., downgrades or liquidity issues) can negatively impact their clients, the issuers. In joint underwriting, financial risk is spread across all underwriting firms, while companies with shared investments face correlated risk exposure. Additionally, we conduct an exercise to further explore fundamentals predictability across different types of news linkages following Ali and Hirshleifer (2020). Results are shown in Table D.1, which suggest that news labels generating the strongest co-mention momentum also exhibit the strongest fundamental predictability, suggesting a substantial economic relationship captured by these links.<sup>37</sup>

<sup>37</sup> We use profit growth to measure firms’ fundamentals and conducted panel fixed effects regressions to assess how past fundamental shocks in linked firms transmit to a focal firm. Quarterly profit growth (OPG) is calculated as the year-over-year percentage change in operating profit for a given quarter. The dependent variable is the OPG of a focal firm in the next quarter, while the independent variable is the average OPG of all news co-mention peers of the

Given the fact that certain news categories carry more information, one natural question is whether the news co-mention momentum effect originates from a specific news topic/label. If true, rather than using the aggregated news sample, we could focus on this specific news topic. To answer that question, we construct news co-mention momentum factors that exclude each of the 12 labels one by one and examine their corresponding effects. As shown in Panel B of Table 16, all 12 news co-mention momentum factors, constructed using news that excludes one of the labels, generate significantly positive returns and alphas, so removing any news category does not render the momentum spillover effect of the remaining news insignificant.

In fact, each one-label-excluded news co-mention momentum factor continues to have a unifying effect over other momentum spillover factors. Spanning test results from Table 17 show that after we add each one-label-excluded news co-mention momentum factor to the CH-4

focal firm under each label. For example, under Label 11, i.e., re-financing, the independent variable is *cOPG\_label11*, calculated by averaging the OPG of all news co-mention peers under Label 11. Control variables include firm size, book-to-market ratio, ROE, investment growth, and Tobin’s Q. The comparison focuses on the news under Labels 1, 2, 4, 8, 9, and 11, as these labels showed strong long-short returns.

**Table 15**  
The impact of news sentiments.

| Panel A: Excess mean returns  |                       |                       |                       |                       |
|-------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Identification windows        | 3-month               | 6-month               | 9-month               | 12-month              |
| Positive                      | <b>1.82</b><br>(5.07) | <b>1.43</b><br>(4.86) | <b>1.33</b><br>(4.65) | <b>1.23</b><br>(4.24) |
| Negative                      | <b>1.33</b><br>(3.05) | <b>1.17</b><br>(3.69) | <b>0.96</b><br>(3.52) | <b>0.91</b><br>(3.64) |
| Panel B: CH-4 adjusted alphas |                       |                       |                       |                       |
| Identification windows        | 3-month               | 6-month               | 9-month               | 12-month              |
| Positive                      | <b>1.72</b><br>(4.94) | <b>1.37</b><br>(4.70) | <b>1.27</b><br>(4.41) | <b>1.17</b><br>(3.99) |
| Negative                      | <b>1.36</b><br>(2.97) | <b>1.15</b><br>(3.51) | <b>0.99</b><br>(3.45) | <b>0.95</b><br>(3.66) |

This table shows the long-short performances of the news co-mention momentum spillover effect based on positive news and negative news under four identification windows, respectively. We first follow the methodology of Jiang et al. (2019) and use the Chinese sentiment dictionary proposed by Jiang et al. (2021) to label each news article as positive or negative. We then conduct the news co-mention momentum based on positive news and negative news separately. We define two firms appearing in the same sentence of the same news article during a given identification window as news co-mention peers. The identification windows include 3-month, 6-month, 9-month, and 12-month. The news co-mention peer firm return of a focal firm is computed as the average excess return of news co-mention peer firms of the focal firm during the identification window, weighted by the number of co-mentions. At the end of each trading week, all sample stocks are sorted quintiles based on the news co-mention peer firm returns. Within each quintile group, the stocks are equally weighted. The long-short portfolio involves buying the highest group and selling the lowest group. All portfolios are held for one week and are rebalanced weekly. The sample period is 2012–2020. Panel A reports the excess returns of portfolios, and Panel B reports the intercepts (alphas) of the regression of the returns on CH-4 factors (market, size, value, abnormal turnover rate) (Liu et al., 2019). All weekly returns and alphas are converted into monthly percentages using compound interest. Newey and West (1987) adjusted *t*-statistics are shown in parentheses. Returns/alphas with *t*-statistics larger than 2.00 are highlighted in bold.

models, the alphas of other momentum spillover factors become either negative or insignificant. The coefficients of the one-label-excluded momentum factors in Panel B are all significantly positive.

These two exercises reveal that the strong performance of the news co-mention momentum effect is a composite reflection of all types of news.

### 6.5. Robustness checks

In this subsection, we examine the robustness of our findings. Specifically, we consider the impact of transaction costs and the shell effect on our results. Additionally, we conduct a series of robustness checks to assess the unifying effect of the news co-mention momentum.

#### 6.5.1. Transaction cost

The portfolio sorting analysis is conducted on a weekly basis in this study. Compared to monthly rebalancing, the weekly approach involves more frequent trading activities, making it important to consider transaction costs in real-world investment scenarios. To address this concern, we follow Fan et al. (2021) and set the transaction cost at 16 bps per trade (buying and selling combined).<sup>38</sup>

<sup>38</sup> In the context of stock trading in China, transaction costs typically consist of three components. Firstly, there is a stamp duty, which is levied on the total transaction amount at a rate of 10 bps. It is important to note that the stamp duty is only imposed on sellers. The second component is the transfer fee, which amounts to 1 bps for both buying and selling transactions in the Shanghai Stock Exchange. This fee applies to stocks priced at 20 CNY per share. Lastly, there is the trading commission, which is the fee paid by investors to brokers for executing their trades. The trading commission is

**Table 16**  
News co-mention momentum and news categories.

|          | Panel A: News co-mention of the label |                       | Panel B: News co-mention other than the label |                       |
|----------|---------------------------------------|-----------------------|-----------------------------------------------|-----------------------|
|          | Ex means                              | CH-4                  | Ex means                                      | CH-4                  |
| Label 1  | <b>2.19</b><br>(3.95)                 | <b>2.17</b><br>(3.92) | <b>1.69</b><br>(5.16)                         | <b>1.62</b><br>(5.10) |
| Label 2  | <b>1.90</b><br>(3.79)                 | <b>1.89</b><br>(3.77) | <b>1.90</b><br>(5.25)                         | <b>1.81</b><br>(5.17) |
| Label 3  | <b>0.92</b><br>(2.54)                 | <b>0.94</b><br>(2.36) | <b>1.93</b><br>(5.31)                         | <b>1.84</b><br>(5.38) |
| Label 4  | <b>1.19</b><br>(2.91)                 | <b>1.17</b><br>(2.76) | <b>1.97</b><br>(5.39)                         | <b>1.90</b><br>(5.29) |
| Label 5  | 0.42<br>(0.74)                        | 0.26<br>(0.43)        | <b>1.86</b><br>(5.21)                         | <b>1.77</b><br>(5.16) |
| Label 6  | −0.37<br>(−0.75)                      | −0.40<br>(−0.80)      | <b>1.89</b><br>(5.32)                         | <b>1.80</b><br>(5.27) |
| Label 7  | 0.00<br>(−0.00)                       | −0.08<br>(−0.20)      | <b>1.91</b><br>(5.34)                         | <b>1.82</b><br>(5.29) |
| Label 8  | <b>1.29</b><br>(3.20)                 | <b>1.18</b><br>(3.07) | <b>1.92</b><br>(5.24)                         | <b>1.83</b><br>(5.16) |
| Label 9  | <b>1.51</b><br>(2.15)                 | <b>1.19</b><br>(2.25) | <b>1.85</b><br>(5.36)                         | <b>1.78</b><br>(5.18) |
| Label 10 | <b>0.93</b><br>(2.49)                 | <b>0.90</b><br>(2.42) | <b>1.94</b><br>(5.30)                         | <b>1.88</b><br>(5.30) |
| Label 11 | <b>4.49</b><br>(4.58)                 | <b>4.19</b><br>(4.52) | <b>1.54</b><br>(4.63)                         | <b>1.48</b><br>(4.53) |
| Label 12 | 0.39<br>(1.02)                        | 0.42<br>(1.09)        | <b>1.88</b><br>(5.16)                         | <b>1.79</b><br>(5.09) |

Panel A shows the long-short mean returns and CH-4 alphas of the news co-mention momentum based on news from different labels. Panel B shows the long-short mean returns and CH-4 alphas of the news co-mention momentum based on news other than each label. The name of each label is shown in Table 1. The sample period is 2012–2020. The sample stocks include all listed stocks on the main board of the Shanghai Stock Exchange, Shenzhen Stock Exchange, and Growth Enterprise Market (GEM). ST shares are excluded. The news co-mention momentum is based on the *same\_sentence* strategy under the 3-month identification window. For Panel A, when identifying new co-mention linkages, only news from the selected label is considered; while for Panel B, only the remaining news outside of the selected label is considered for identification. At the end of each trading week, all sample stocks are sorted into quintiles based on different peer firm returns respectively. Within each quintile group, the stocks are equally weighted. The long-short portfolio involves buying the highest group and selling the lowest group. All portfolios are held for one week and are rebalanced weekly. All weekly returns and alphas are converted into monthly percentages using compound interest. Newey and West (1987) adjusted *t*-statistics are shown in parentheses. Returns/alphas with *t*-statistics higher than 2.00 are highlighted in bold.

Table D.2 in Appendix D presents the portfolio sorting results for each type of cross-firm momentum, taking into account the 16 bps transaction cost. The trading strategy based on the news co-mention momentum remains significantly profitable after accounting for transaction costs. The long-short portfolio generates an average excess return of 1.29% (*t*-statistic = 3.56) and a CH-4 adjusted alpha of 1.21% (*t*-statistic = 3.42) per month.

However, other momentum spillover effects do not generate profitable trading strategies after accounting for transaction costs. The analyst momentum strategy yields a long-short mean excess return of 0.21% and an alpha of 0.20%, both of which are statistically insignificant. Similarly, the industry momentum effect does not generate profitable trading strategies once transaction costs are considered. The

subject to a maximum limit of 3 bps of the transaction amount. However, the typical rates for trading commissions are around 2.5 bps. It is worth mentioning that institutional investors with higher trading volumes often enjoy lower commission rates compared to individual investors. Setting the transaction cost at 16 bps implicitly assumes a conservative approach by considering a turnover ratio of 100% for each rebalancing period.

**Table 17**  
Spanning test based on different news categories.

| Label to drop | Panel A: CH-4+Sentence_3 alphas |                  |                              |                  |                |                  | Panel B: Factor loadings Sentence_3 |                               |                              |                              |                              |                              |
|---------------|---------------------------------|------------------|------------------------------|------------------|----------------|------------------|-------------------------------------|-------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
|               | Analyst                         | Industry         | Geographic                   | Technology       | Statistical    | Concept          | Analyst                             | Industry                      | Geographic                   | Technology                   | Statistical                  | Concept                      |
| 1             | −0.36<br>(−1.41)                | −0.47<br>(−1.81) | 0.25<br>(1.91)               | −0.22<br>(−0.92) | 0.18<br>(0.46) | −0.51<br>(−1.61) | <b>0.91</b><br><b>(13.07)</b>       | <b>0.82</b><br><b>(11.83)</b> | <b>0.10</b><br><b>(4.37)</b> | <b>0.57</b><br><b>(7.28)</b> | <b>0.98</b><br><b>(8.64)</b> | <b>0.77</b><br><b>(6.36)</b> |
| 2             | −0.42<br>(−1.62)                | −0.52<br>(−2.04) | 0.24<br>(1.85)               | −0.24<br>(−1.01) | 0.15<br>(0.38) | −0.49<br>(−1.55) | <b>0.85</b><br><b>(12.35)</b>       | <b>0.76</b><br><b>(10.78)</b> | <b>0.09</b><br><b>(4.32)</b> | <b>0.52</b><br><b>(6.86)</b> | <b>0.90</b><br><b>(8.68)</b> | <b>0.76</b><br><b>(6.51)</b> |
| 3             | −0.36<br>(−1.31)                | −0.47<br>(−1.74) | 0.25<br>(1.92)               | −0.19<br>(−0.79) | 0.19<br>(0.47) | −0.49<br>(−1.48) | <b>0.80</b><br><b>(11.59)</b>       | <b>0.72</b><br><b>(9.59)</b>  | <b>0.09</b><br><b>(4.20)</b> | <b>0.49</b><br><b>(6.33)</b> | <b>0.86</b><br><b>(8.24)</b> | <b>0.70</b><br><b>(5.99)</b> |
| 4             | −0.46<br>(−1.81)                | −0.56<br>(−2.23) | 0.23<br>(1.80)               | −0.27<br>(−1.13) | 0.09<br>(0.23) | −0.50<br>(−1.54) | <b>0.83</b><br><b>(13.23)</b>       | <b>0.75</b><br><b>(11.35)</b> | <b>0.09</b><br><b>(4.07)</b> | <b>0.51</b><br><b>(7.50)</b> | <b>0.89</b><br><b>(8.73)</b> | <b>0.70</b><br><b>(6.65)</b> |
| 5             | −0.41<br>(−1.62)                | −0.52<br>(−2.05) | 0.24<br>(1.86)               | −0.25<br>(−1.07) | 0.17<br>(0.42) | −0.54<br>(−1.72) | <b>0.86</b><br><b>(12.37)</b>       | <b>0.78</b><br><b>(10.90)</b> | <b>0.09</b><br><b>(4.23)</b> | <b>0.54</b><br><b>(7.04)</b> | <b>0.91</b><br><b>(8.75)</b> | <b>0.79</b><br><b>(6.98)</b> |
| 6             | −0.44<br>(−1.74)                | −0.55<br>(−2.13) | 0.24<br>(1.84)               | −0.27<br>(−1.14) | 0.15<br>(0.37) | −0.59<br>(−1.85) | <b>0.86</b><br><b>(12.41)</b>       | <b>0.78</b><br><b>(10.98)</b> | <b>0.09</b><br><b>(4.17)</b> | <b>0.54</b><br><b>(7.16)</b> | <b>0.90</b><br><b>(8.66)</b> | <b>0.78</b><br><b>(6.89)</b> |
| 7             | −0.44<br>(−1.73)                | −0.54<br>(−2.09) | 0.24<br>(1.84)               | −0.27<br>(−1.13) | 0.15<br>(0.37) | −0.56<br>(−1.77) | <b>0.86</b><br><b>(12.42)</b>       | <b>0.77</b><br><b>(10.38)</b> | <b>0.09</b><br><b>(4.20)</b> | <b>0.53</b><br><b>(6.77)</b> | <b>0.89</b><br><b>(8.71)</b> | <b>0.77</b><br><b>(6.59)</b> |
| 8             | −0.43<br>(−1.69)                | −0.54<br>(−2.10) | 0.24<br>(1.85)               | −0.26<br>(−1.08) | 0.12<br>(0.30) | −0.53<br>(−1.70) | <b>0.84</b><br><b>(12.55)</b>       | <b>0.76</b><br><b>(10.93)</b> | <b>0.09</b><br><b>(4.25)</b> | <b>0.52</b><br><b>(7.11)</b> | <b>0.91</b><br><b>(9.39)</b> | <b>0.77</b><br><b>(7.17)</b> |
| 9             | −0.43<br>(−1.70)                | −0.53<br>(−2.05) | 0.25<br>(1.95)               | −0.25<br>(−1.05) | 0.15<br>(0.37) | −0.50<br>(−1.54) | <b>0.87</b><br><b>(12.92)</b>       | <b>0.78</b><br><b>(11.75)</b> | <b>0.09</b><br><b>(3.91)</b> | <b>0.53</b><br><b>(7.48)</b> | <b>0.91</b><br><b>(8.94)</b> | <b>0.78</b><br><b>(7.24)</b> |
| 10            | −0.44<br>(−1.69)                | −0.55<br>(−2.11) | 0.24<br>(1.86)               | −0.27<br>(−1.12) | 0.17<br>(0.42) | −0.56<br>(−1.70) | <b>0.83</b><br><b>(11.98)</b>       | <b>0.75</b><br><b>(10.30)</b> | <b>0.09</b><br><b>(4.03)</b> | <b>0.52</b><br><b>(6.63)</b> | <b>0.85</b><br><b>(8.42)</b> | <b>0.73</b><br><b>(6.13)</b> |
| 11            | −0.24<br>(−0.97)                | −0.38<br>(−1.54) | <b>0.26</b><br><b>(2.06)</b> | −0.15<br>(−0.62) | 0.36<br>(0.94) | −0.40<br>(−1.30) | <b>0.91</b><br><b>(12.38)</b>       | <b>0.84</b><br><b>(11.82)</b> | <b>0.10</b><br><b>(4.26)</b> | <b>0.57</b><br><b>(7.28)</b> | <b>0.95</b><br><b>(8.80)</b> | <b>0.90</b><br><b>(8.03)</b> |
| 12            | −0.38<br>(−1.47)                | −0.49<br>(−1.88) | 0.25<br>(1.95)               | −0.21<br>(−0.89) | 0.17<br>(0.44) | −0.46<br>(−1.41) | <b>0.83</b><br><b>(11.86)</b>       | <b>0.75</b><br><b>(10.12)</b> | <b>0.09</b><br><b>(4.13)</b> | <b>0.51</b><br><b>(6.51)</b> | <b>0.89</b><br><b>(8.50)</b> | <b>0.75</b><br><b>(6.53)</b> |

Panel A reports the alphas of other momentum spillover factors after controlling for the CH-4 factors and the one-label-excluded news co-mention factor. Panel B reports the factor loadings of the one-label-excluded news co-mention factor. The name of each label is shown in Table 1. Each momentum spillover factor is regressed on the CH-4 factors plus a one-label-excluded news co-mention momentum factor. The one-label-excluded news co-mention momentum factor is constructed based on all remaining news other than the selected label. For example, in Row 1, only news outside of Label 1 is considered to identify the news co-mention peer stocks. The news co-mention momentum factor is based on *same\_sentence* type under the 3-month identification window. The sample stocks include all listed stocks on the main board of the Shanghai Stock Exchange, Shenzhen Stock Exchange, and Growth Enterprise Market (GEM). ST shares are excluded. The sample period of news co-mention momentum is 2012–2020. The sample period of concept momentum is Aug. 2016–2020. The sample periods for other momentums are 2006–2020. Newey and West (1987) adjusted *t*-statistics are shown in parentheses. Alphas and coefficients with *t*-statistics higher than 2.00 are highlighted in bold.

statistical momentum strategy, which initially showed strong performance without considering transaction costs, experiences a significant decline both economically and statistically when transaction costs are taken into account. The magnitude of the excess mean return decreases considerably, and the CH-4 adjusted alpha becomes statistically insignificant at 0.69% with a *t*-statistic of 1.74. Furthermore, when considering the 16 bps transaction cost, the trading strategies based on geographic momentum, technology momentum, and concept momentum exhibit negative long–short returns and CH-4 adjusted alphas.

#### 6.5.2. Dropping shell firms

According to Liu et al. (2019), back-door listings through reverse mergers are common in China due to the strict and costly IPO process. This can lead to shell firms with inflated market values and biased stock returns that are disconnected from their underlying fundamentals. To address this potential issue and ensure the robustness of our analysis, we exclude shell firms from the dataset and re-evaluate the portfolio sorting analysis for each cross-firm momentum.

At the end of each trading week, we sort all sample stocks except for the ST shares and stocks in the bottom 30% of capitalization based on their peer firm returns. The stocks are then divided into quintiles, and within each quintile, they are equally weighted. The long–short portfolio strategy involves buying the stocks in the highest quintile and selling the stocks in the lowest quintile. These portfolios are held for one week and rebalanced weekly.

Table D.3 in Appendix D reports the excess returns and CH-4 adjusted alphas after dropping the shell firms. Our main results are robust to the exclusion of shell firms. Despite a small decrease in predictive power, the news co-mention momentum continues to dominate other momentum spillover effects. Specifically, the news co-mention momentum strategy generates a statistically significant long–short average return and CH-4 adjusted alpha of 1.00% (*t*-statistic = 3.87) and 0.95% (*t*-statistic = 3.63), respectively. The analyst, industry, geographic, and statistical momentum also exhibit a slight decrease in their predictive power but remain statistically significant. However, the technology and concept momentum lose their predictability after excluding shell firms from the analysis.

#### 6.5.3. Relation to standard momentum

There is a possibility that the significant profits associated with news co-mention momentum might be derived from standard momentum effects. However, it should be noted that standard momentum is very weak in China's stock market. According to Chui et al. (2010), the 6-month momentum yields only a monthly long–short return of 0.257% with an insignificant *t*-value of 0.92.<sup>39</sup> Many other studies also

<sup>39</sup> In later analysis, we construct the standard momentum based on the past-six-month cumulative return following studies about the standard momentum effect in China (Chui et al., 2010, 2022).

report weak cross-sectional momentum in China, for example, Liu et al. (2019), Du et al. (2022a), Li et al. (2023), and Hou et al. (2023). Thus, it is unlikely that the profitable news co-mention momentum spillover originates from the traditionally insignificant momentum effect. To further address this concern, we have conducted a series of empirical tests to demonstrate that news co-mention momentum is distinct from standard cross-sectional momentum.

We first conduct an exclusion test. Specifically, we removed focal stocks whose past-six-month cumulative returns are in the bottom 10% (representing extremely low standard return momentum) from the bottom-sorted quintile (Q1) and excluded stocks whose returns are in the top 10% (representing extremely high standard return momentum) from the top-sorted quintile (Q5). The results are shown in Table D.4. If the classical momentum is the primary driver of news co-mention momentum, we would expect the long-short portfolio to become less profitable after excluding extreme momentum stocks. Surprisingly, after removing focal stocks with extreme past cumulative returns, the news co-mention momentum generates even larger profits. For example, the 3-month excluded co-mention momentum achieves a long-short mean return of 2.10% per month with a *t*-statistic of 5.23, which is higher than the 1.94% (*t*-statistic = 5.33) observed in the previous case (see Table 3). A similar pattern is observed across the other three identification windows. Interestingly, this result provides additional support for the limited attention theory: stocks exhibiting extreme cumulative returns attract more investor attention (Barber and Odean, 2008; Da et al., 2011), which suggests that news co-mention momentum should be weaker among such stocks.

Then, we compute the correlation coefficient between the standard momentum signal and the news co-mention momentum signal. The pooled correlation is only 0.0013 for all stock-month observations. The median of monthly cross-sectional correlation is 0.0048. These figures indicate a very low statistical correlation between standard momentum and news co-mention momentum, and these two signals contain distinct information.

Third, we use the Carhart 4-factor model, which includes a standard momentum factor, in our portfolio analysis for risk adjustment. The results, shown in Panel E of Table 4, reveal that the Carhart 4-factor adjusted alpha for the news co-mention momentum is 1.90% per month with a significant *t*-value of 5.28. Furthermore, the long-short portfolio does not load significantly on the standard momentum factor, supporting our assertion that news co-mention momentum cannot be explained by standard momentum effects.

Finally, we conducted a  $5 \times 5$  double-sorting analysis using both standard momentum and news co-mention momentum variables. At the end of each trading week, we first sorted all sample stocks into quintiles based on their past six-month cumulative returns. Within each momentum quintile, stocks were further sorted into quintiles based on their news co-mention returns. We then implemented a long-short strategy within each momentum quintile, buying stocks in the highest co-mention quintile and selling those in the lowest. Table D.5 shows that within each momentum quintile — except for Q5 — the portfolio returns are mostly monotonic relative to the ranking based on the news co-mention signal. On average, the long-short portfolio of the news co-mention momentum still generates a profitable monthly excess return of 0.66% (*t*-statistics = 3.52) and a CH-4 adjusted alpha of 0.64% (*t*-statistics = 3.25).

All this evidence indicates that news co-mention momentum is distinct from standard cross-sectional momentum.

#### 6.5.4. Robustness of the unifying effect

In this section, we conduct a series of exercises to examine the robustness of the unifying effect of the news co-mention momentum.

We conduct the spanning tests under alternative factor models. Firstly, we re-conduct the spanning test without CH-4 factors to exclude their influence and better examine the explanatory power of each

momentum spillover factor. Table D.6 in Appendix D demonstrates that the news co-mention factor alone is sufficient to explain all other momentum spillover effects. However, none of the other six factors demonstrate the same level of explanatory power as the news co-mention factor across the four identification windows. We then replace the benchmark factor model CH-4 with the behavioral factor model, applying the DHS-3 model plus the sentiment factor PMO from CH-4 to create a more nuanced systemic pricing factor model.<sup>40</sup> As shown in Table D.7, the news co-mention momentum factors remain robust in explaining other types of momentum spillovers. Conversely, other momentum spillover factors struggle to account for the news co-mention momentum factors under various identification windows.

In the main body of the paper, we primarily focus on the industry linkage based on the Shenwan-1 classification. Next, we test the unifying effect of the news co-mention momentum over industry momentum using alternative industry classifications, including the three levels of Shenwan classification (Shenwan-1, -2, -3), two levels of CSRC classification (CSRC-1, -2), and three levels of CITIC classification (CITIC-1, -2, -3). For brevity, we use only the Sentence\_3 factor for the news co-mention factors. Table D.8 in Appendix D reports the alphas of the news co-mention momentum factor from the CH-4+Industry model and the alphas of the eight industry factors from the CH-4+Sentence\_3 model. The news co-mention momentum factor consistently exhibits a significantly positive alpha across all the candidate industry factors. Conversely, all eight industry momentum factors are explained by the news co-mention momentum factor, and their alphas become negative when the Sentence\_3 factor is included.

The full sample period analyzed is from 2012 to 2020 in the main body of the paper. This is primarily due to the limited availability of news data in the earlier years. In contrast, most of the other momentum factors were analyzed from 2006 to 2020. As a robustness check, we consider an alternative sample period from 2006–2020,<sup>41</sup> and the results are reported in Table D.9 from Appendix D. The news co-mention momentum factor cannot be explained by any of the other factors, and it always has a significantly positive alpha in all specifications. In contrast, all the other factors can be explained by the news co-mention momentum factor, as their alphas are either insignificant or even exhibit a negative sign when the Sentence\_3 factor is included.

Subsequently, we explore the *same\_article* link identification strategy when conducting spanning tests. Specifically, we construct the news co-mention momentum factor based on the *same\_article* type under identification windows of 3, 6, 9, and 12 months. The spanning test results, shown in Table D.10 from Appendix D, confirm that our main results are robust to the choice of news linkage identification strategy.

Finally, we adjust how we construct the news co-mention predictive signal. Previously, the news-based predictive signal was computed as the average excess return of linked firms, weighted by the number of co-mention times. We have modified the weighting method to use floating market value instead of co-mention times. Table D.11 demonstrates that the unifying effect of the news co-mention momentum is robust regardless of the weighting method.

## 7. Conclusions

In recent years, there has been surging interest in the extraction and utilization of soft information contained within news articles. This paper utilizes a large dataset of millions of Chinese news articles and applies both article co-mentioning and sentence co-mentioning strategies to identify economic linkages among firms. Our work demonstrates the benefits of utilizing alternative big data by showing that economic

<sup>40</sup> The PMO factor is constructed based on the abnormal trading turnover rate (Liu et al., 2019).

<sup>41</sup> The news database starts from 2006.

linkages identified from business news contain rich and valuable information. We find that news co-mention momentum spillover unifies all forms of momentum spillover effects previously studied in the Chinese stock market, including shared-analyst momentum, industry momentum, geographic momentum at the province and city levels, customer–supplier momentum, technology momentum, statistical momentum, and concept momentum. This result remains robust across different news-linkage identification strategies, alternative definitions for competitor links, and various sample periods.

To further explore the source of this unifying effect, we examine the differences in the information content of news-implied links and other linkages. We find that news-implied linkages are more comprehensive compared to other types of linkage proxies. Specifically, news co-mentioning incorporates both industry information and valuable non-industry linkage information, contributing to its strong predictive power for future returns. Furthermore, news exhibits the advantage of prompt updates, allowing us to timely identify changes in linkages among firms.

We also investigate the mechanism behind the news-based momentum spillover. We find that news co-mention momentum is weaker among firms with higher analyst coverage, more analyst reports, larger float values, higher institutional holder proportions, less opacity, and less linkage complexity, supporting the limited attention explanation.

Finally, we wish to point out that the trading strategy based on the news co-mention momentum spillover effect is profitable, even when considering real-world transaction costs. However, due to the rapidly updated nature of news, investment strategies based on news co-mention momentum should be executed within a short-term time-frame.

CRediT authorship contribution statement

**Shuyi Ge:** Writing – review & editing, Writing – original draft, Software, Methodology, Investigation, Formal analysis, Data curation.  
**Shaoran Li:** Writing – review & editing, Writing – original draft, Software, Methodology, Investigation, Formal analysis, Data curation.  
**Hanyu Zheng:** Writing – review & editing, Writing – original draft, Software, Methodology, Investigation, Formal analysis, Data curation.

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Appendix A. More descriptive statistics

See [Table A.1](#) and [Table A.2](#).

Appendix B. An example of analysts’ research directions

Another name for analysts in China is industry researchers. This name can better reflect the fact that most Chinese analysts focus on one specific industry and are accordingly grouped in advance. Therefore, the analyst co-coverage linkage largely comes from the industry linkage.

In this part, we show an example of the research groups and directions of analysts from the Research Division of China Securities Co., Ltd., a representative and leading security company in China. The information is collected manually from its public recruitment advertisement for fresh graduates in 2023 summer.

- **Finance**  
Banking, Non-bank, FinTech

**Table A.1**  
Descriptive statistics for the news data.

| Year | Mean   | Std.   | Max  | Min |
|------|--------|--------|------|-----|
| 2006 | 97.23  | 59.60  | 252  | 1   |
| 2007 | 88.04  | 61.19  | 337  | 1   |
| 2008 | 70.72  | 28.88  | 152  | 3   |
| 2009 | 57.83  | 27.19  | 137  | 12  |
| 2010 | 61.06  | 33.66  | 135  | 1   |
| 2011 | 72.23  | 41.87  | 194  | 1   |
| 2012 | 84.29  | 52.16  | 183  | 1   |
| 2013 | 243.08 | 185.71 | 657  | 1   |
| 2014 | 336.04 | 212.59 | 699  | 1   |
| 2015 | 236.23 | 158.75 | 589  | 1   |
| 2016 | 197.29 | 131.52 | 493  | 1   |
| 2017 | 126.35 | 89.32  | 359  | 1   |
| 2018 | 156.37 | 105.31 | 467  | 1   |
| 2019 | 136.68 | 94.55  | 464  | 1   |
| 2020 | 334.87 | 313.69 | 1685 | 1   |

This table summarizes the daily number of news items for each year from 2006 to 2020.

- **TMT<sup>42</sup>**  
Communication, Computer, Electronics, Media, Artificial intelligence
- **Consumption**  
Food and beverage, Clothing and textile, Education, Home appliances, Commerce, Agriculture, Social service
- **Pharmaceutical**  
Pharmacy, BioTech, Medical apparatus and instruments, Medicine
- **Manufacturing**  
Military, Electrical equipment (new energy), Machinery, Automobile (new energy), Lithium battery
- **Property and cycles**  
Real estate, Architecture, Chemical, Environment, Transportation, Metal and new metal materials, Coal, Small- and mid-cap stocks

The bolded names indicate the general research groups, while the names below indicate the specific research coverage directions (directions of macro, strategy, and financial engineering are not listed).

From the collected information, it is clear that the specific directions largely overlap with industry classifications. Therefore, the shared-analyst linkage has strong limitations in identifying peer firms from the market, which may account for the failure of the unifying effect of in China.

Appendix C. Sample news from the prominent label

This part, we provide some sample news from Label 11, Re-financing, which could individually result in the strongest new co-mention momentum among other labels (see [Table C.1](#)).

Appendix D. Additional tables

See [Tables D.1](#) to [D.11](#).

Data availability

Data will be made available on request.

<sup>42</sup> Abbreviation for telecommunications, media, and technology.

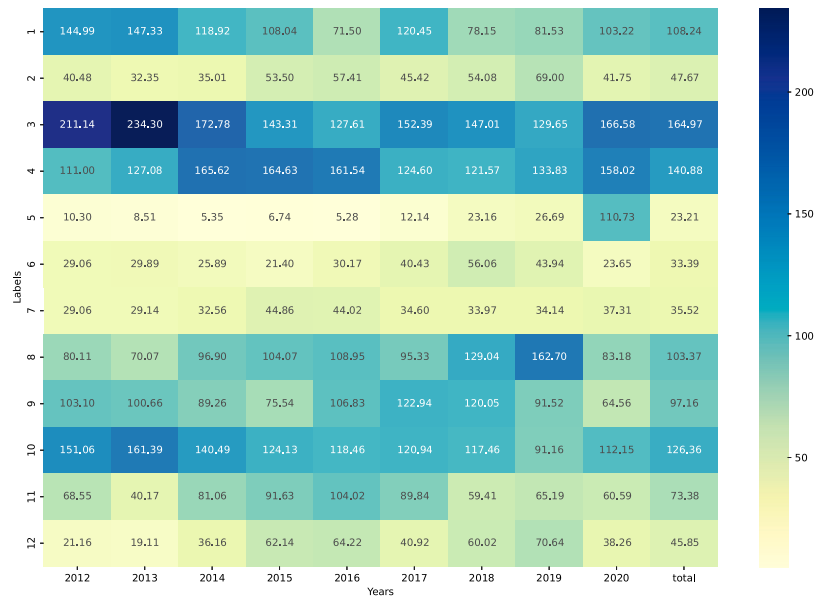


Fig. 3. Annual Distribution of News Categories by Permille (‰) of Each Label. This heatmap illustrates the annual distribution of news from each news category. The names of 12 categories are given in Table 1.

Table A.2  
Average link density and average number of sample stocks.

| Panel A: Average link density |                 |         |          |          |       |          |            |             |         |
|-------------------------------|-----------------|---------|----------|----------|-------|----------|------------|-------------|---------|
|                               | News co-mention | Analyst | Industry | Province | City  | Customer | Technology | Statistical | Concept |
| 2006                          |                 | 20.12%  | 2.34%    | 5.49%    | 3.12% |          | 21.12%     | 10.74%      |         |
| 2007                          |                 | 5.17%   | 2.18%    | 5.82%    | 3.30% |          | 23.98%     | 11.18%      |         |
| 2008                          |                 | 5.03%   | 2.13%    | 5.86%    | 3.23% |          | 25.58%     | 11.68%      |         |
| 2009                          |                 | 6.46%   | 2.06%    | 6.26%    | 3.41% |          | 28.50%     | 11.05%      |         |
| 2010                          |                 | 7.74%   | 1.94%    | 6.64%    | 3.31% | 0.69%    | 30.47%     | 12.02%      |         |
| 2011                          |                 | 10.54%  | 1.94%    | 6.88%    | 3.30% | 0.64%    | 33.95%     | 13.36%      |         |
| 2012                          | 1.27%           | 10.23%  | 1.91%    | 7.08%    | 3.36% | 0.53%    | 38.60%     | 12.85%      |         |
| 2013                          | 1.17%           | 6.38%   | 1.91%    | 7.16%    | 3.38% | 0.57%    | 44.55%     | 11.33%      |         |
| 2014                          | 0.81%           | 4.61%   | 1.92%    | 7.26%    | 3.39% | 1.36%    | 48.53%     | 10.87%      |         |
| 2015                          | 0.54%           | 4.52%   | 1.91%    | 7.47%    | 3.48% | 1.45%    | 49.99%     | 11.63%      |         |
| 2016                          | 0.43%           | 5.41%   | 1.91%    | 7.78%    | 3.54% | 1.64%    | 51.60%     | 12.03%      | 15.57%  |
| 2017                          | 0.40%           | 6.50%   | 1.91%    | 8.21%    | 3.59% | 1.47%    | 53.73%     | 12.75%      | 6.83%   |
| 2018                          | 0.39%           | 6.24%   | 1.91%    | 8.29%    | 3.66% | 1.69%    | 56.37%     | 12.55%      | 8.29%   |
| 2019                          | 0.36%           | 5.75%   | 1.95%    | 8.40%    | 3.70% | 1.59%    | 58.59%     | 11.26%      | 10.93%  |
| 2020                          | 0.88%           | 4.10%   | 1.94%    | 8.58%    | 3.68% | 1.84%    | 64.48%     | 10.73%      | 24.50%  |

| Panel B: Average number of sample stocks |                 |         |          |          |      |          |            |             |         |
|------------------------------------------|-----------------|---------|----------|----------|------|----------|------------|-------------|---------|
|                                          | News co-mention | Analyst | Industry | Province | City | Customer | Technology | Statistical | Concept |
| 2006                                     |                 | 662     | 1364     | 1432     | 1297 |          | 485        | 1145        |         |
| 2007                                     |                 | 731     | 1490     | 1548     | 1407 |          | 536        | 1215        |         |
| 2008                                     |                 | 921     | 1567     | 1602     | 1463 |          | 590        | 1274        |         |
| 2009                                     |                 | 1051    | 1665     | 1752     | 1613 |          | 669        | 1415        |         |
| 2010                                     |                 | 1320    | 2012     | 2107     | 1962 | 80       | 787        | 1503        |         |
| 2011                                     |                 | 1470    | 2293     | 2341     | 2196 | 151      | 956        | 1588        |         |
| 2012                                     |                 | 1523    | 2448     | 2470     | 2328 | 183      | 1170       | 1843        |         |
| 2013                                     | 1382            | 1443    | 2450     | 2515     | 2377 | 196      | 1413       | 2107        |         |
| 2014                                     | 1522            | 1443    | 2576     | 2630     | 2490 | 195      | 1623       | 2159        |         |
| 2015                                     | 1151            | 1645    | 2799     | 2822     | 2697 | 122      | 1773       | 2047        |         |
| 2016                                     | 873             | 1755    | 3025     | 3117     | 2996 | 70       | 1921       | 2204        | 1888    |
| 2017                                     | 929             | 1919    | 3463     | 3493     | 3368 | 70       | 2095       | 2397        | 2640    |
| 2018                                     | 936             | 1755    | 3567     | 3589     | 3458 | 68       | 2259       | 2696        | 3025    |
| 2019                                     | 821             | 1548    | 3692     | 3703     | 3575 | 67       | 2420       | 3222        | 3267    |
| 2020                                     | 1370            | 1550    | 3937     | 3999     | 3875 | 64       | 2577       | 3502        | 3617    |

This table summarizes the average link density and average number of sample stocks of each cross-firm momentum. The link density is computed as the ratio of the number of non-zero elements of the link matrix to the total number of elements of the link matrix.

Table C.1

Sample news from Label 11: Re-financing.

| English                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Chinese                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Kelun Pharmaceuticals Co., Ltd. (002422) announced that the first tranche of its ultra-short-term commercial paper for 2022 was issued on February 24, 2022, with the raised funds fully received by February 28, 2022. It is reported that the abbreviation for this issuance of ultra-short-term commercial paper is "22 Kelun SCP001". The total issuance amount is 800 million yuan, with an annual coupon rate of 2.95%. The issuance price is 100 yuan per 100 yuan of face value. The main underwriters are <b>Bank of Communications Co., Ltd. (601328)</b> and <b>Bank of Shanghai Co., Ltd. (601229)</b> . The interest commencement date is February 28, 2022, and the maturity date is November 25, 2022....                                                                                                                                                                                                                                                                                                                                                                                                                                            | 科伦药业 ( <b>002422</b> ) 公告, 公司 2022 年度第一期超短期融资券于 2022 年 2 月 24 日发行, 募集资金已于 2022 年 2 月 28 日全额到账。据悉, 本次发行超短期融资券的简称为 22 科伦 SCP001, 发行总额为 8 亿元, 票面年利率为 2.95%, 发行价格为 100 元/百元面值, 主承销商为 <b>交通银行股份有限公司 (601328)</b> 、 <b>上海银行股份有限公司 (601229)</b> , 起息日为 2022 年 2 月 28 日, 兑付日为 2022 年 11 月 25 日。...                                                                                                                             |
| Dlg Exhibitions and Events Co., Ltd. (600826) announced the resolutions of the 24th meeting of its 9th Board of Directors, approving the " <i>Proposal to Authorize the Activation of the Company's Financial Assets</i> ". The resolutions are as follows: 1. To activate existing financial assets and adjust the financial asset structure, the management is authorized to reduce part of the existing financial assets in accordance with the securities market conditions. This includes the products listed in the proposal, such as <b>Haitong Securities Co., Ltd. (600837)</b> , <b>Shenda Co., Ltd. (600626)</b> , <b>Orient International Enterprise Ltd. (600278)</b> , and the Shanghai SOE ETF, with a total amount not exceeding 1.2 billion yuan. 2. ...                                                                                                                                                                                                                                                                                                                                                                                           | 兰生股份 ( <b>600826</b> ) 公布, 公司第九届董事会第二十四次会议决议, 同意《关于授权盘活公司金融资产的议案》: 1、为盘活存量金融资产, 调整金融资产结构, 授权经理层根据证券市场行情择机减持部分存量金融资产, 包括议案所列 <b>海通证券 (600837)</b> 、 <b>申达股份 (600626)</b> 、 <b>东方创业 (600278)</b> 、上海国企 ETF 等产品, 合计金额不超过 12 亿元。2、...                                                                                                                                                                                      |
| On the 11th, <b>GD Power Development Co., Ltd. (600795)</b> , <b>Aluminum Corporation of China Ltd. (601600)</b> , and <b>China Eastern Airlines Co., Ltd. (600115)</b> each announced that they will respectively issue 4 billion yuan, 6 billion yuan, and 4 billion yuan of ultra-short-term commercial paper on September 12. ... The announcements indicate that <b>Bank of China (601988)</b> will serve as the lead underwriter and bookrunner for <b>GD Power Development Co., Ltd.'s (600795)</b> current issuance of ultra-short-term commercial paper, with <b>China CITIC Bank (601998)</b> acting as the joint lead underwriter. For <b>Aluminum Corporation of China's (601600)</b> current issuance, <b>China Construction Bank (601939)</b> will be the lead underwriter and bookrunner, and <b>Shanghai Pudong Development Bank (600000)</b> will be the joint lead underwriter. For <b>China Eastern Airlines Co., Ltd.'s (600115)</b> current issuance, the <b>Industrial and Commercial Bank of China (601398)</b> will be the lead underwriter and bookrunner, with <b>China Minsheng Bank (600016)</b> serving as the joint lead underwriter. | 11 日, <b>国电电力 (600795)</b> 、 <b>中国铝业 (601600)</b> 和 <b>东方航空 (600115)</b> 相继公告, 将于 9 月 12 日分别发行 40 亿元、60 亿元和 40 亿元的超短期融资券。... 公告显示, <b>中国银行 (601988)</b> 为 <b>国电电力 (600795)</b> 本期超短融的主承销商和簿记管理人, <b>中信银行 (601998)</b> 为联席主承销商。 <b>建设银行 (601939)</b> 为 <b>中国铝业 (601600)</b> 本期超短融的主承销商和簿记管理人, <b>浦发银行 (600000)</b> 为联席主承销商。 <b>工商银行 (601398)</b> 为 <b>东方航空 (600115)</b> 本期超短融的主承销商和簿记管理人, <b>民生银行 (600016)</b> 为联席主承销商。 |

**Table D.1**  
Fundamental predictability under different news labels.

|               | 1               | 2               | 3               | 4               | 5               | 6               | 7                 | 8               | 9               | 10              | 11              | 12                | 13              | 14                |
|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------|-----------------|-----------------|-----------------|-----------------|-------------------|-----------------|-------------------|
| cOPG_label1   | 0.046<br>(3.31) |                 |                 |                 |                 |                 | 0.134<br>(1.53)   | 0.021<br>(1.80) |                 |                 |                 |                   |                 | 0.104<br>(1.57)   |
| cOPG_label2   |                 | 0.027<br>(1.10) |                 |                 |                 |                 | 0.082<br>(1.80)   |                 | 0.014<br>(0.57) |                 |                 |                   |                 | 0.060<br>(1.44)   |
| cOPG_label4   |                 |                 | 0.023<br>(1.81) |                 |                 |                 | 0.038<br>(1.07)   |                 |                 | 0.013<br>(1.04) |                 |                   |                 | 0.022<br>(0.94)   |
| cOPG_label8   |                 |                 |                 | 0.033<br>(2.34) |                 |                 | −0.042<br>(−1.09) |                 |                 |                 | 0.024<br>(2.21) |                   |                 | −0.051<br>(−1.35) |
| cOPG_label9   |                 |                 |                 |                 | 0.004<br>(0.22) |                 | 0.026<br>(0.41)   |                 |                 |                 |                 | −0.012<br>(−0.76) |                 | −0.045<br>(−0.72) |
| cOPG_label11  |                 |                 |                 |                 |                 | 0.073<br>(3.29) | 0.081<br>(1.87)   |                 |                 |                 |                 |                   | 0.049<br>(2.42) | 0.063<br>(1.87)   |
| Control       | NO              | NO              | NO              | NO              | NO              | NO              | NO                | YES             | YES             | YES             | YES             | YES               | YES             | YES               |
| Time FE       | YES             | YES             | YES             | YES             | YES             | YES             | YES               | YES             | YES             | YES             | YES             | YES               | YES             | YES               |
| Stock FE      | YES             | YES             | YES             | YES             | YES             | YES             | YES               | YES             | YES             | YES             | YES             | YES               | YES             | YES               |
| Avg. R Square | 0.002           | 0.001           | 0.001           | 0.001           | 0.000           | 0.007           | 0.041             | 0.086           | 0.086           | 0.061           | 0.073           | 0.106             | 0.105           | 0.147             |
| Total Obs.    | 15 280          | 5793            | 11 422          | 10 172          | 8972            | 6246            | 352               | 14 919          | 5649            | 11 102          | 9852            | 8636              | 5972            | 343               |
| Avg. Obs.     | 347             | 132             | 260             | 231             | 204             | 142             | 9                 | 339             | 128             | 252             | 224             | 196               | 136             | 9                 |

This table compares the fundamental predictability of news co-mention networks under label 1, 2, 4, 8, 9, and 11. The dependent variable is the quarterly operating profit growth (OPG) in the next period. OPG is computed as the ratio of the operating profit at the current quarter to the value at the same quarter in the past year. The independent variable is the connected OPG which is computed as the average OPG of news co-mention peers under different news labels. Control variables include firm size, book-to-market ratio, ROE, investment growth and Tobin's Q. Time and stock fixed effects are also controlled. T-statistics based on standard errors clustered at the time and stock levels are reported in the parentheses.

**Table D.2**  
Considering transaction costs.

| Panel A: Excess returns       |                              |                |                |                  |                  |                              |                  |
|-------------------------------|------------------------------|----------------|----------------|------------------|------------------|------------------------------|------------------|
|                               | News co-mention              | Analyst        | Industry       | Geographic       | Technology       | Statistical                  | Concept          |
| 1 (Low)                       | 0.09<br>(0.11)               | 0.53<br>(0.72) | 0.70<br>(0.95) | 0.87<br>(1.18)   | 0.89<br>(1.19)   | 0.27<br>(0.36)               | −0.96<br>(−1.03) |
| 2                             | 0.42<br>(0.52)               | 0.63<br>(0.89) | 0.87<br>(1.18) | 0.99<br>(1.34)   | 1.01<br>(1.35)   | 0.70<br>(0.91)               | −0.88<br>(−0.97) |
| 3                             | 0.46<br>(0.58)               | 0.96<br>(1.34) | 1.09<br>(1.43) | 1.13<br>(1.51)   | 1.29<br>(1.71)   | 1.07<br>(1.40)               | −0.59<br>(−0.66) |
| 4                             | 0.74<br>(0.88)               | 1.38<br>(1.92) | 1.25<br>(1.64) | 1.19<br>(1.59)   | 1.27<br>(1.67)   | 1.45<br>(1.93)               | −0.43<br>(−0.49) |
| 5 (High)                      | 2.03<br>(2.25)               | 1.39<br>(1.87) | 1.47<br>(1.91) | 1.22<br>(1.58)   | 1.47<br>(1.90)   | 1.63<br>(2.17)               | −0.36<br>(−0.42) |
| 5–1                           | <b>1.29</b><br><b>(3.56)</b> | 0.21<br>(0.83) | 0.12<br>(0.53) | −0.29<br>(−2.36) | −0.06<br>(−0.31) | <b>0.71</b><br><b>(2.07)</b> | −0.04<br>(−0.11) |
| SpearmanR                     | 1.00                         | 1.00           | 1.00           | 1.00             | 0.90             | 1.00                         | 1.00             |
| P value                       | 0.00                         | 0.00           | 0.00           | 0.00             | 0.04             | 0.00                         | 0.00             |
| Panel B: CH-4 adjusted alphas |                              |                |                |                  |                  |                              |                  |
|                               | News co-mention              | Analyst        | Industry       | Geographic       | Technology       | Statistical                  | Concept          |
| 1 (Low)                       | −0.23<br>(−0.28)             | 0.18<br>(0.24) | 0.33<br>(0.44) | 0.49<br>(0.66)   | 0.47<br>(0.61)   | −0.06<br>(−0.07)             | −0.89<br>(−0.92) |
| 2                             | 0.14<br>(0.17)               | 0.28<br>(0.38) | 0.48<br>(0.63) | 0.60<br>(0.79)   | 0.62<br>(0.81)   | 0.31<br>(0.39)               | −0.85<br>(−0.90) |
| 3                             | 0.13<br>(0.17)               | 0.64<br>(0.88) | 0.68<br>(0.88) | 0.75<br>(0.98)   | 0.97<br>(1.26)   | 0.64<br>(0.84)               | −0.58<br>(−0.63) |
| 4                             | 0.42<br>(0.51)               | 1.08<br>(1.49) | 0.84<br>(1.10) | 0.77<br>(1.01)   | 0.89<br>(1.15)   | 1.01<br>(1.33)               | −0.46<br>(−0.49) |
| 5 (High)                      | 1.62<br>(1.91)               | 1.03<br>(1.36) | 1.10<br>(1.39) | 0.83<br>(1.07)   | 1.07<br>(1.33)   | 1.28<br>(1.67)               | −0.39<br>(−0.44) |
| 5–1                           | <b>1.21</b><br><b>(3.42)</b> | 0.20<br>(0.72) | 0.12<br>(0.47) | −0.30<br>(−2.29) | −0.04<br>(−0.18) | 0.69<br>(1.74)               | −0.14<br>(−0.36) |
| SpearmanR                     | 0.90                         | 0.90           | 1.00           | 1.00             | 0.90             | 1.00                         | 1.00             |
| P value                       | 0.04                         | 0.04           | 0.00           | 0.00             | 0.04             | 0.00                         | 0.00             |

This table reports the portfolio sorting performances of the news co-mention momentum, analyst momentum, industry momentum, geographic momentum, technology momentum, statistical momentum, and concept momentum considering a transaction cost of 16 bps (buy and sell combined). The sample stocks include all listed stocks on the main board of the Shanghai Stock Exchange, Shenzhen Stock Exchange, and Growth Enterprise Market (GEM). ST shares are excluded. The news co-mention momentum is based on *same sentence* type under the 3-month identification window. The industry momentum is based on the Shenwan-1 classification. The geographic momentum is at the province level. The sample period of news co-mention momentum is 2012–2020. The sample period of concept momentum is Aug. 2016–2020. The sample periods for other momentums are 2006–2020. At the end of each trading week, all sample stocks are sorted into quintiles based on different peer firm returns respectively. Within each quintile group, the stocks are equally weighted. The long-short portfolio involves buying the highest group and selling the lowest group. All portfolios are held for one week and are rebalanced weekly. Panel A presents the excess returns of portfolios, and Panel B shows the intercepts of the regression of the returns on CH-4 factors (Liu et al., 2019) (market, size, value, abnormal turnover rate). All weekly returns and alphas are converted into monthly percentages using compound interest. SpearmanR reports the Spearman correlation coefficient between the portfolio return and the serial number for each sorting. Newey and West (1987) adjusted *t*-statistics are shown in parentheses. Long-short returns/alphas with *t*-statistics higher than 2.00 are highlighted in bold.

**Table D.3**  
Dropping shell firms.

| Panel A: Excess returns       |                              |                              |                              |                              |                |                              |                  |
|-------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|----------------|------------------------------|------------------|
|                               | News co-mention              | Analyst                      | Industry                     | Geographic                   | Technology     | Statistical                  | Concept          |
| 1                             | 0.43<br>(0.53)               | 0.92<br>(1.25)               | 0.95<br>(1.30)               | 1.10<br>(1.53)               | 1.13<br>(1.55) | 0.83<br>(1.12)               | −0.52<br>(−0.56) |
| 2                             | 0.78<br>(0.99)               | 1.04<br>(1.48)               | 1.09<br>(1.52)               | 1.19<br>(1.64)               | 1.15<br>(1.59) | 1.05<br>(1.40)               | −0.25<br>(−0.27) |
| 3                             | 0.84<br>(1.09)               | 1.38<br>(1.95)               | 1.28<br>(1.72)               | 1.29<br>(1.77)               | 1.49<br>(2.03) | 1.38<br>(1.85)               | −0.03<br>(−0.04) |
| 4                             | 1.04<br>(1.28)               | 1.79<br>(2.50)               | 1.37<br>(1.84)               | 1.39<br>(1.89)               | 1.47<br>(1.97) | 1.60<br>(2.20)               | −0.16<br>(−0.19) |
| 5                             | 1.43<br>(1.73)               | 1.74<br>(2.34)               | 1.69<br>(2.22)               | 1.44<br>(1.90)               | 1.57<br>(2.08) | 1.80<br>(2.42)               | 0.06<br>(0.07)   |
| 5–1                           | <b>1.00</b><br><b>(3.87)</b> | <b>0.81</b><br><b>(2.96)</b> | <b>0.74</b><br><b>(2.73)</b> | <b>0.33</b><br><b>(2.34)</b> | 0.44<br>(1.84) | <b>0.96</b><br><b>(2.63)</b> | 0.58<br>(1.52)   |
| SpearmanR                     | 1.00                         | 0.90                         | 1.00                         | 1.00                         | 0.90           | 1.00                         | 0.90             |
| P value                       | 0.00                         | 0.04                         | 0.00                         | 0.00                         | 0.04           | 0.00                         | 0.04             |
| Panel B: CH-4 adjusted alphas |                              |                              |                              |                              |                |                              |                  |
|                               | News co-mention              | Analyst                      | Industry                     | Geographic                   | Technology     | Statistical                  | Concept          |
| 1                             | 0.17<br>(0.21)               | 0.60<br>(0.79)               | 0.62<br>(0.83)               | 0.79<br>(1.07)               | 0.75<br>(1.00) | 0.53<br>(0.69)               | −0.47<br>(−0.50) |
| 2                             | 0.52<br>(0.67)               | 0.73<br>(1.01)               | 0.79<br>(1.07)               | 0.86<br>(1.16)               | 0.82<br>(1.09) | 0.72<br>(0.95)               | −0.23<br>(−0.25) |
| 3                             | 0.56<br>(0.73)               | 1.10<br>(1.51)               | 0.96<br>(1.26)               | 0.97<br>(1.30)               | 1.21<br>(1.62) | 1.02<br>(1.35)               | −0.06<br>(−0.06) |
| 4                             | 0.76<br>(0.95)               | 1.54<br>(2.14)               | 0.99<br>(1.32)               | 1.04<br>(1.39)               | 1.15<br>(1.51) | 1.25<br>(1.69)               | −0.24<br>(−0.26) |
| 5                             | 1.12<br>(1.40)               | 1.40<br>(1.84)               | 1.37<br>(1.73)               | 1.10<br>(1.43)               | 1.21<br>(1.55) | 1.48<br>(1.94)               | −0.02<br>(−0.02) |
| 5–1                           | <b>0.95</b><br><b>(3.63)</b> | <b>0.80</b><br><b>(2.62)</b> | <b>0.74</b><br><b>(2.55)</b> | <b>0.32</b><br><b>(2.05)</b> | 0.46<br>(1.84) | <b>0.95</b><br><b>(2.25)</b> | 0.46<br>(1.14)   |
| SpearmanR                     | 1.00                         | 0.90                         | 1.00                         | 1.00                         | 0.90           | 1.00                         | 0.70             |
| P value                       | 0.00                         | 0.04                         | 0.00                         | 0.00                         | 0.04           | 0.00                         | 0.19             |

This table reports the portfolio sorting performances of the news co-mention momentum, analyst momentum, industry momentum, geographic momentum, technology momentum, statistical momentum, and concept momentum after dropping all stocks with the bottom 30% capitalization on the main board of the Shanghai Stock Exchange, Shenzhen Stock Exchange, and Growth Enterprise Market (GEM). ST shares are also excluded. The news co-mention momentum is based on *same\_sentence* type under the 3-month identification window. The industry momentum is based on the Shenwan-1 classification. The geographic momentum is at the province level. The sample period of news co-mention momentum is 2012–2020. The sample period of concept momentum is Aug. 2016–2020. The sample periods for other momentums are 2006–2020. At the end of each trading week, all sample stocks are sorted into quintiles based on different peer firm returns respectively. Within each quintile group, the stocks are equally weighted. The long-short portfolio involves buying the highest group and selling the lowest group. All portfolios are held for one week and are rebalanced weekly. Panel A is the excess returns of portfolios, and Panel B is the intercepts of the regression of the returns on CH-4 factors (Liu et al., 2019) (market, size, value, abnormal turnover rate). All weekly returns and alphas are converted into monthly percentages using compound interest. SpearmanR reports the Spearman correlation coefficient between the portfolio return and the serial number for each sorting. Newey and West (1987) adjusted *t*-statistics are shown in parentheses. Long-short returns/alphas with *t*-statistics higher than 2.00 are highlighted in bold.

**Table D.4**  
News co-mention momentum excluding stocks with extreme momentum.

|           | Panel A: Excess returns      |                              |                              |                              | Panel B: CH-4 adjusted alphas |                              |                              |                              |
|-----------|------------------------------|------------------------------|------------------------------|------------------------------|-------------------------------|------------------------------|------------------------------|------------------------------|
|           | 3-month                      | 6-month                      | 9-month                      | 12-month                     | 3-month                       | 6-month                      | 9-month                      | 12-month                     |
| 1 (Low)   | 0.76<br>(0.90)               | 0.80<br>(0.96)               | 0.83<br>(1.00)               | 0.82<br>(0.99)               | 0.45<br>(0.53)                | 0.49<br>(0.58)               | 0.52<br>(0.62)               | 0.50<br>(0.60)               |
| 5 (High)  | 2.87<br>(3.14)               | 2.50<br>(2.79)               | 2.43<br>(2.69)               | 2.38<br>(2.64)               | 2.46<br>(2.87)                | 2.12<br>(2.51)               | 2.05<br>(2.42)               | 2.00<br>(2.36)               |
| 5–1       | <b>2.10</b><br><b>(5.23)</b> | <b>1.69</b><br><b>(4.88)</b> | <b>1.59</b><br><b>(4.70)</b> | <b>1.54</b><br><b>(4.59)</b> | <b>2.01</b><br><b>(5.25)</b>  | <b>1.62</b><br><b>(4.91)</b> | <b>1.53</b><br><b>(4.73)</b> | <b>1.49</b><br><b>(4.59)</b> |
| SpearmanR | 1.00                         | 1.00                         | 1.00                         | 1.00                         | 0.90                          | 1.00                         | 1.00                         | 1.00                         |
| P-value   | 0.00                         | 0.00                         | 0.00                         | 0.00                         | 0.04                          | 0.00                         | 0.00                         | 0.00                         |

This table reports the portfolio sorting results of the news co-mention momentum spillover effect excluding stocks with extreme traditional momentum under the four identification windows, respectively. The identification windows include 3-month, 6-month, 9-month, and 12-month. The news co-mention peer firm return of a focal firm is computed as the average excess return of news co-mention peer firms of the focal firm during the identification window, weighted by the number of co-mentions. At the end of each trading week, all sample stocks are sorted into quintiles based on the news co-mention peer firm returns. Within each quintile group, the stocks are equally weighted. The long-short portfolio involves buying the highest group (Q5) and selling the lowest group (Q1). When forming news co-mention long-short portfolios, we exclude focal stocks whose past-six-month cumulative returns are among the bottom 10% (extreme low standard return momentum) from the bottom-sorted quintile (Q1) and exclude focal stocks whose past-six-month cumulative returns are among the top 10% (extreme high standard return momentum) from the top-sorted quintile (Q5). All portfolios are held for one week and are rebalanced weekly. The sample period is 2012–2020. Panel A reports the excess returns of portfolios, and Panel B reports the intercepts (alphas) of the regression of the returns on CH-4 factors (market, size, value, abnormal turnover rate) (Liu et al., 2019). All weekly returns and alphas are converted into monthly percentages using compound interest. SpearmanR reports the Spearman correlation coefficient between the portfolio return and the serial number for each sorting. Newey and West (1987) adjusted *t*-statistics are shown in parentheses. Long-short returns/alphas with *t*-statistics higher than 2.00 are highlighted in bold.

Table D.5

Double sorting of the standard momentum and news co-mention momentum.

| Panel A: Excess mean returns  |                |                |                |                |                |                              |
|-------------------------------|----------------|----------------|----------------|----------------|----------------|------------------------------|
| Co-mention Mom                | 1 (Low)        | 2              | 3              | 4              | 5 (High)       | 5-1                          |
| 1 (Low)                       | 0.76<br>(0.87) | 1.00<br>(1.21) | 1.06<br>(1.23) | 1.34<br>(1.52) | 1.66<br>(1.86) | <b>0.89</b><br><b>(3.23)</b> |
| 2                             | 0.86<br>(1.02) | 1.10<br>(1.42) | 1.19<br>(1.48) | 1.56<br>(1.86) | 1.41<br>(1.67) | <b>0.55</b><br><b>(2.09)</b> |
| 3                             | 0.81<br>(0.97) | 1.33<br>(1.68) | 1.07<br>(1.38) | 1.38<br>(1.66) | 1.53<br>(1.86) | <b>0.71</b><br><b>(2.82)</b> |
| 4                             | 0.91<br>(1.12) | 0.82<br>(1.01) | 1.06<br>(1.29) | 1.30<br>(1.58) | 1.85<br>(2.13) | 0.93<br><b>(3.63)</b>        |
| 5 (High)                      | 0.85<br>(0.93) | 0.91<br>(1.06) | 0.40<br>(0.44) | 0.73<br>(0.79) | 1.07<br>(1.16) | 0.22<br>(0.56)               |
| Avg                           | 0.84<br>(1.01) | 1.03<br>(1.32) | 0.95<br>(1.19) | 1.26<br>(1.53) | 1.50<br>(1.80) | <b>0.66</b><br><b>(3.52)</b> |
| Panel B: CH-4 adjusted alphas |                |                |                |                |                |                              |
| Co-mention Mom                | 1 (Low)        | 2              | 3              | 4              | 5 (High)       | 5-1                          |
| 1 (Low)                       | 0.37<br>(0.43) | 0.62<br>(0.75) | 0.72<br>(0.84) | 1.01<br>(1.16) | 1.35<br>(1.55) | <b>0.97</b><br><b>(3.19)</b> |
| 2                             | 0.42<br>(0.51) | 0.71<br>(0.93) | 0.75<br>(0.97) | 1.18<br>(1.45) | 1.01<br>(1.26) | <b>0.59</b><br><b>(2.27)</b> |
| 3                             | 0.43<br>(0.51) | 1.03<br>(1.29) | 0.72<br>(0.94) | 0.95<br>(1.18) | 1.13<br>(1.41) | <b>0.69</b><br><b>(2.60)</b> |
| 4                             | 0.68<br>(0.83) | 0.60<br>(0.72) | 0.76<br>(0.95) | 0.89<br>(1.09) | 1.54<br>(1.77) | <b>0.85</b><br><b>(3.21)</b> |
| 5 (High)                      | 0.65<br>(0.71) | 0.80<br>(0.93) | 0.25<br>(0.28) | 0.56<br>(0.60) | 0.74<br>(0.79) | 0.09<br>(0.23)               |
| Avg                           | 0.51<br>(0.62) | 0.75<br>(0.96) | 0.64<br>(0.82) | 0.92<br>(1.13) | 1.15<br>(1.41) | <b>0.64</b><br><b>(3.25)</b> |

This table reports the  $5 \times 5$  double sorting results on the standard momentum and news co-mention momentum. At the end of each trading week, we first sort all sample stocks into quintiles based on their past-6-month cumulative returns. Then, within each momentum quintile, we further sort stocks into quintiles based on their news co-mention returns. The long-short strategy within each momentum quintile is buying the highest co-mention quintile and selling the lowest co-mention quintile. The average portfolio return of each co-mention momentum group is computed by taking the mean return across the five momentum groups. All portfolios are held for one week and are rebalanced weekly. The sample period is 2012–2020. Panel A reports the excess returns of portfolios, and Panel B reports the intercepts (alphas) of the regression of the returns on CH-4 factors (market, size, value, abnormal turnover rate) (Liu et al., 2019). All weekly returns and alphas are converted into monthly percentages using compound interest. Newey and West (1987) adjusted  $t$ -statistics are shown in parentheses. Long-short returns/alphas with  $t$ -statistics higher than 2.00 are highlighted in bold.

Table D.6

Spanning tests without CH-4 factors.

| Dependent factors   | Sentence_3                   | Sentence_6                   | Sentence_9                   | Sentence_12                  | Analyst                      | Industry                     | Geographic                   | Technology                   | Concept          |
|---------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------|
| Explanatory factors |                              |                              |                              |                              |                              |                              |                              |                              |                  |
| Sentence_3          |                              | −0.18<br>(−1.79)             | −0.25<br>(−1.96)             | −0.34<br>(−2.45)             | −0.53<br>(−2.04)             | −0.62<br>(−2.48)             | 0.22<br>(1.74)               | −0.36<br>(−1.54)             | −0.54<br>(−1.70) |
| Sentence_6          | <b>0.41</b><br><b>(3.78)</b> |                              | −0.09<br>(−1.26)             | −0.18<br>(−2.16)             | −0.40<br>(−1.73)             | −0.51<br>(−2.29)             | 0.24<br>(1.97)               | −0.30<br>(−1.37)             | −0.45<br>(−1.49) |
| Sentence_9          | <b>0.58</b><br><b>(4.23)</b> | <b>0.17</b><br><b>(2.34)</b> |                              | −0.09<br>(−2.01)             | −0.31<br>(−1.39)             | −0.44<br>(−2.10)             | 0.24<br>(1.95)               | −0.25<br>(−1.20)             | −0.34<br>(−1.17) |
| Sentence_12         | <b>0.71</b><br><b>(4.66)</b> | <b>0.29</b><br><b>(3.39)</b> | <b>0.13</b><br><b>(2.72)</b> |                              | −0.22<br>(−1.02)             | −0.36<br>(−1.77)             | <b>0.25</b><br><b>(2.05)</b> | −0.20<br>(−0.96)             | −0.27<br>(−0.98) |
| Analyst             | <b>1.27</b><br><b>(5.07)</b> | <b>0.86</b><br><b>(4.30)</b> | <b>0.72</b><br><b>(3.80)</b> | <b>0.62</b><br><b>(3.43)</b> |                              | 0.11<br>(0.82)               | <b>0.25</b><br><b>(2.01)</b> | 0.14<br>(0.90)               | 0.07<br>(0.32)   |
| Industry            | <b>1.43</b><br><b>(5.15)</b> | <b>1.02</b><br><b>(4.59)</b> | <b>0.89</b><br><b>(4.33)</b> | <b>0.79</b><br><b>(3.98)</b> | 0.15<br>(1.08)               |                              | <b>0.26</b><br><b>(2.09)</b> | 0.12<br>(0.77)               | 0.37<br>(1.88)   |
| Geographic          | <b>1.69</b><br><b>(5.19)</b> | <b>1.32</b><br><b>(4.61)</b> | <b>1.17</b><br><b>(4.17)</b> | <b>1.08</b><br><b>(3.90)</b> | <b>0.60</b><br><b>(2.42)</b> | <b>0.55</b><br><b>(2.40)</b> |                              | <b>0.42</b><br><b>(2.05)</b> | 0.46<br>(1.38)   |
| Technology          | <b>1.59</b><br><b>(4.72)</b> | <b>1.19</b><br><b>(4.19)</b> | <b>1.06</b><br><b>(3.96)</b> | <b>0.97</b><br><b>(3.71)</b> | 0.37<br>(1.89)               | 0.29<br>(1.63)               | <b>0.28</b><br><b>(2.23)</b> |                              | 0.35<br>(1.32)   |
| Statistical         | <b>1.25</b><br><b>(4.50)</b> | <b>0.83</b><br><b>(3.64)</b> | <b>0.67</b><br><b>(3.19)</b> | <b>0.55</b><br><b>(2.75)</b> | 0.20<br>(0.94)               | 0.22<br>(1.04)               | 0.24<br>(1.84)               | 0.22<br>(1.15)               | 0.12<br>(0.39)   |
| Concept             | <b>1.41</b><br><b>(4.28)</b> | <b>0.97</b><br><b>(3.95)</b> | <b>0.77</b><br><b>(3.31)</b> | <b>0.63</b><br><b>(3.04)</b> | 0.31<br>(1.38)               | −0.19<br>(−1.02)             | <b>0.31</b><br><b>(2.03)</b> | −0.03<br>(−0.14)             |                  |
| Non_news            | <b>1.23</b><br><b>(3.93)</b> | <b>0.81</b><br><b>(3.36)</b> | <b>0.58</b><br><b>(2.49)</b> | <b>0.45</b><br><b>(2.20)</b> |                              |                              |                              |                              |                  |

This table reports the intercept (or alpha) of regressing the time series of different long-short momentum returns on the  $MS$  momentum spillover factor alone. The construction of the  $MS$  factor is given in Section 4.1. The column name indicates the type of long-short momentum return, i.e., the dependent variable, while the index name means the  $MS$  factor, i.e., the explanatory variable. For example, the alphas of the row Sentence\_3 indicate the alphas from the time-series regressions of long-short portfolio returns of other momentums on the Sentence\_3 factor alone. In the last row, we include all the six momentum spillover factors that are not related to news as additional explanatory variables. The news co-mention momentum factors are based on *same\_sentence* type under identification windows including 3-month, 6-month, 9-month, and 12-month. The industry momentum is based on the Shenwan-1 classification, while the geographic momentum is conducted on the province level. We do not consider the customer momentum due to the low data quality. The sample stocks include all listed stocks on the main board of the Shanghai Stock Exchange, Shenzhen Stock Exchange, and Growth Enterprise Market (GEM). ST shares are excluded. The sample period of news co-mention momentum is 2012–2020. The sample period of concept momentum is Aug. 2016–2020. The sample periods for other momentums are 2006–2020. Newey and West (1987) adjusted  $t$ -statistics are shown in parentheses. Alphas with  $t$ -statistics higher than 2.00 are highlighted in bold.

Table D.7

Spanning tests based on DHS+Sentiment factors.

| Panel A: Alphas of factor spanning tests |                       |                         |                         |                         |                         |                         |                        |                        |                        |                        |
|------------------------------------------|-----------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|
|                                          | Sentence_3            | Sentence_6              | Sentence_9              | Sentence_12             | Analyst                 | Industry                | Geographic             | Technology             | Statistical            | Concept                |
| DHS+Sentence_3                           |                       | −0.19<br>(−1.89)        | −0.26<br>(−2.08)        | −0.31<br>(−2.32)        | −0.47<br>(−1.83)        | −0.53<br>(−2.02)        | 0.23<br>(1.84)         | −0.31<br>(−1.27)       | 0.20<br>(0.54)         | −0.49<br>(−1.51)       |
| DHS+Sentence_6                           | <b>0.42</b><br>(3.92) |                         | −0.08<br>(−1.18)        | −0.14<br>(−1.66)        | −0.33<br>(−1.39)        | −0.41<br>(−1.74)        | <b>0.26</b><br>(2.06)  | −0.24<br>(−1.05)       | 0.32<br>(0.95)         | −0.37<br>(−1.19)       |
| DHS+Sentence_9                           | <b>0.59</b><br>(4.38) | <b>0.17</b><br>(2.28)   |                         | −0.06<br>(−1.27)        | −0.24<br>(−1.05)        | −0.35<br>(−1.54)        | <b>0.25</b><br>(2.01)  | −0.20<br>(−0.89)       | 0.36<br>(1.16)         | −0.27<br>(−0.94)       |
| DHS+Sentence_12                          | <b>0.69</b><br>(4.51) | <b>0.26</b><br>(2.84)   | <b>0.10</b><br>(2.00)   |                         | −0.18<br>(−0.81)        | −0.30<br>(−1.36)        | <b>0.26</b><br>(2.07)  | −0.16<br>(−0.75)       | 0.40<br>(1.32)         | −0.22<br>(−0.78)       |
| DHS+Analyst                              | <b>1.25</b><br>(5.01) | <b>0.83</b><br>(4.10)   | <b>0.69</b><br>(3.66)   | <b>0.62</b><br>(3.48)   |                         | −0.03<br>(−0.19)        | <b>0.30</b><br>(2.49)  | 0.01<br>(0.07)         | <b>0.95</b><br>(2.94)  | 0.10<br>(0.47)         |
| DHS+Industry                             | <b>1.41</b><br>(4.94) | <b>0.99</b><br>(4.18)   | <b>0.85</b><br>(3.93)   | <b>0.78</b><br>(3.75)   | 0.32<br>(1.93)          |                         | <b>0.30</b><br>(2.50)  | 0.05<br>(0.26)         | <b>1.11</b><br>(3.32)  | 0.38<br>(1.84)         |
| DHS+Geographic                           | <b>1.76</b><br>(5.38) | <b>1.37</b><br>(4.73)   | <b>1.22</b><br>(4.31)   | <b>1.17</b><br>(4.19)   | <b>0.87</b><br>(2.82)   | <b>0.58</b><br>(2.02)   |                        | 0.43<br>(1.60)         | <b>1.49</b><br>(3.76)  | 0.44<br>(1.21)         |
| DHS+Technology                           | <b>1.61</b><br>(4.80) | <b>1.20</b><br>(4.14)   | <b>1.07</b><br>(3.93)   | <b>1.01</b><br>(3.82)   | <b>0.61</b><br>(2.44)   | 0.32<br>(1.58)          | <b>0.33</b><br>(2.89)  |                        | <b>1.42</b><br>(3.68)  | 0.36<br>(1.39)         |
| DHS+Statistical                          | <b>1.23</b><br>(4.26) | <b>0.79</b><br>(3.20)   | <b>0.63</b><br>(2.76)   | <b>0.54</b><br>(2.51)   | 0.22<br>(0.84)          | 0.04<br>(0.18)          | <b>0.27</b><br>(2.19)  | 0.12<br>(0.54)         |                        | 0.10<br>(0.33)         |
| DHS+Concept                              | <b>1.44</b><br>(4.24) | <b>0.94</b><br>(3.63)   | <b>0.75</b><br>(3.10)   | <b>0.63</b><br>(2.88)   | 0.30<br>(1.33)          | −0.18<br>(−0.96)        | <b>0.35</b><br>(2.20)  | −0.03<br>(−0.11)       | <b>1.01</b><br>(2.84)  |                        |
| DHS+Non_news                             | <b>1.13</b><br>(4.53) | <b>0.71</b><br>(3.43)   | <b>0.53</b><br>(2.78)   | <b>0.44</b><br>(2.47)   |                         |                         |                        |                        |                        |                        |
| Panel B: DHS+Sentence_3 factor loading   |                       |                         |                         |                         |                         |                         |                        |                        |                        |                        |
|                                          | Sentence_3            | Sentence_6              | Sentence_9              | Sentence_12             | Analyst                 | Industry                | Geographic             | Technology             | Statistical            | Concept                |
| Sentence_3                               |                       | <b>0.900</b><br>(29.59) | <b>0.881</b><br>(24.25) | <b>0.889</b><br>(21.38) | <b>0.842</b><br>(11.94) | <b>0.756</b><br>(10.99) | <b>0.087</b><br>(4.26) | <b>0.518</b><br>(7.17) | <b>0.868</b><br>(8.60) | <b>0.733</b><br>(6.52) |
| mktrf                                    |                       | −0.007<br>(−0.60)       | −0.010<br>(−0.63)       | −0.026<br>(−1.43)       | −0.080<br>(−3.34)       | −0.064<br>(−2.13)       | 0.014<br>(1.00)        | −0.034<br>(−1.25)      | −0.078<br>(−1.72)      | −0.007<br>(−0.17)      |
| R_fin                                    |                       | −0.009<br>(−0.41)       | −0.027<br>(−1.02)       | −0.031<br>(−1.00)       | −0.054<br>(−0.87)       | −0.046<br>(−0.78)       | −0.011<br>(−0.48)      | −0.010<br>(−0.24)      | −0.090<br>(−1.17)      | 0.055<br>(0.82)        |
| R_pead                                   |                       | 0.067<br>(1.74)         | 0.088<br>(1.76)         | 0.063<br>(1.17)         | 0.137<br>(1.26)         | 0.003<br>(0.03)         | −0.027<br>(−0.70)      | 0.020<br>(0.22)        | 0.099<br>(0.69)        | −0.123<br>(−0.92)      |
| PMO                                      |                       | −0.029<br>(−1.85)       | −0.031<br>(−1.79)       | −0.052<br>(−1.91)       | −0.069<br>(−1.69)       | −0.036<br>(−0.79)       | −0.025<br>(−1.57)      | −0.066<br>(−1.81)      | −0.188<br>(−2.20)      | 0.069<br>(0.73)        |
| Adj. R2                                  |                       | 0.881                   | 0.825                   | 0.797                   | 0.526                   | 0.456                   | 0.059                  | 0.274                  | 0.356                  | 0.353                  |
| # Obs.                                   |                       | 464                     | 464                     | 464                     | 464                     | 464                     | 464                    | 464                    | 464                    | 227                    |

Panel A reports the intercept (or alpha) of regressing the time series of different long–short momentum returns on the DHS-3 factors (*MKT*, *R\_fin*, *R\_pead*) plus a sentiment factor PMO and plus each *MS* momentum spillover factor. The *PMO* factor is from the CH-4 factor model. The construction of the *MS* factor is given in Section 4.1. The column name indicates the type of long–short momentum return (i.e., the dependent variable), while the row name indicates the augmented DHS model (i.e., the original DHS-3 model plus a sentiment factor and plus a specific *MS* factor). For example, the alphas of the row DHS+Sentence\_3 indicate the alphas from the time-series regressions of long–short portfolio returns of other momentums on *MKT*, *R\_fin*, *R\_pead*, *PMO* and the Sentence\_3 factor. In the last row of panel A, we include all the six momentum spillover factors that are not related to news as additional explanatory variables. News co-mention momentum factors are based on *same\_sentence* type under identification windows including 3-month, 6-month, 9-month, and 12-month. We change the weighting method to floating market value weighting instead of co-mention times weighting. The industry momentum is based on the Shenwan-1 classification, while the geographic momentum is conducted on the province level. We do not consider the customer momentum due to the low data quality. The sample stocks include all listed stocks on the main board of the Shanghai Stock Exchange, Shenzhen Stock Exchange, and Growth Enterprise Market (GEM). ST shares are excluded. The sample period of news co-mention momentum is 2012–2020. The sample period of concept momentum is Aug. 2016–2020. The sample periods for other momentums are 2006–2020. Newey and West (1987) adjusted *t*-statistics are shown in parentheses. Alphas with *t*-statistics higher than 2.00 are highlighted in bold. Panel B reports the factor loads of other momentum spillover factors on the DHS+Sentence\_3 model. Coefficients with *t*-statistics higher than 2.00 are highlighted in bold.

Table D.8

Robustness checks based on alternative industry classifications.

| 1                     | 2                  |
|-----------------------|--------------------|
| Alphas of Sentence_3  | CH-4+Sentence_3    |
| CH-4+Shenwan-1        | Alpha of Shenwan-1 |
| <b>1.35</b><br>(5.08) | −0.53<br>(−2.10)   |
| CH-4+Shenwan-2        | Alpha of Shenwan-2 |
| <b>1.34</b><br>(5.02) | −0.54<br>(−2.08)   |
| CH-4+Shenwan-3        | Alpha of Shenwan-3 |
| <b>1.30</b><br>(5.17) | −0.48<br>(−2.11)   |
| CH-4+CSRC-1           | Alpha of CSRC-1    |
| <b>1.55</b><br>(4.94) | −0.11<br>(−0.45)   |
| CH-4+CSRC-2           | Alpha of CSRC-2    |
| <b>1.44</b><br>(5.38) | −0.64<br>(−2.38)   |
| CH-4+CITIC-1          | Alpha of CITIC-1   |
| <b>1.48</b><br>(5.54) | −0.71<br>(−2.66)   |
| CH-4+CITIC-2          | Alpha of CITIC-2   |
| <b>1.27</b><br>(4.97) | −0.52<br>(−2.01)   |

(continued on next page)

Table D.8 (continued).

| 1                                            | 2                                    |
|----------------------------------------------|--------------------------------------|
| Alphas of Sentence_3                         | CH-4+Sentence_3                      |
| CH-4+CITIC-3<br><b>1.33</b><br><b>(5.48)</b> | Alpha of CITIC-3<br>−0.59<br>(−2.57) |

This table reports the factor-spanning test results of the industry momentum under different classification systems. We adopt three levels of Shenwan classification (Shenwan-1, −2, −3), two levels of CSRC classification (CSRC-1, −2), and three levels of CITIC classification (CITIC-1, −2, −3) to construct the industry momentum factor. The Sentence\_3 news co-mention factor is based on *same\_sentence* type under the 3-month identification window. Column 1 indicates CH-4+Industry adjusted alphas of the Sentence\_3 long-short return based on the eight classification methods, respectively, and the row name indicates the specific type of each CH-4+Industry model. Column 2 represents the CH-4+Sentence\_3 adjusted alphas of the industry momentum based on the eight classification methods. The CH-4 factors (*MKT*, *SMB*, *HML*, *PMO*) are from Liu et al. (2019). The sample stocks include all listed stocks on the main board of the Shanghai Stock Exchange, Shenzhen Stock Exchange, and Growth Enterprise Market (GEM). ST shares are excluded. The sample period is 2012–2020. Newey and West (1987) adjusted *t*-statistics are shown in parentheses. Alphas with *t*-statistics higher than 2.00 are highlighted in bold.

Table D.9

Spanning tests of different sample periods.

| Panel A: Period: 2006–2020 |                              |                              |                              |                              |                              |                              |
|----------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
|                            | Sentence_3                   | Analyst                      | Industry                     | Geographic                   | Technology                   | Statistical                  |
| CH-4+Sentence_3            |                              | −0.09<br>(−0.45)             | −0.06<br>(−0.27)             | 0.23<br>(1.67)               | 0.05<br>(0.22)               | 0.44<br>(1.21)               |
| CH-4+Analyst               | <b>0.71</b><br><b>(3.61)</b> |                              | 0.11<br>(0.76)               | 0.24<br>(1.83)               | 0.17<br>(0.99)               | <b>0.70</b><br><b>(2.18)</b> |
| CH-4+Industry              | <b>0.74</b><br><b>(3.54)</b> | 0.15<br>(0.96)               |                              | 0.25<br>(1.92)               | 0.14<br>(0.87)               | <b>0.78</b><br><b>(2.25)</b> |
| CH-4+Geographic            | <b>1.01</b><br><b>(3.95)</b> | <b>0.59</b><br><b>(2.21)</b> | <b>0.55</b><br><b>(2.26)</b> |                              | <b>0.44</b><br><b>(2.07)</b> | <b>1.05</b><br><b>(2.61)</b> |
| CH-4+Technology            | <b>0.85</b><br><b>(3.42)</b> | 0.34<br>(1.59)               | 0.27<br>(1.41)               | <b>0.27</b><br><b>(2.05)</b> |                              | <b>0.93</b><br><b>(2.50)</b> |
| CH-4+Statistical           | <b>0.72</b><br><b>(2.96)</b> | 0.20<br>(0.90)               | 0.23<br>(0.97)               | 0.23<br>(1.69)               | 0.25<br>(1.24)               |                              |
| CH-4+Non_news              | <b>0.61</b><br><b>(2.99)</b> | 0.32<br>(1.94)               | 0.22<br>(1.42)               | 0.12<br>(0.87)               |                              |                              |
| Panel B: Period: 2012–2020 |                              |                              |                              |                              |                              |                              |
|                            | Sentence_3                   | Analyst                      | Industry                     | Geographic                   | Technology                   | Statistical                  |
| CH-4+Sentence_3            |                              | −0.44<br>(−1.76)             | −0.53<br>(−2.10)             | 0.25<br>(1.92)               | −0.26<br>(−1.11)             | 0.17<br>(0.43)               |
| CH-4+Analyst               | <b>1.18</b><br><b>(4.97)</b> |                              | −0.07<br>(−0.43)             | <b>0.31</b><br><b>(2.55)</b> | 0.04<br>(0.22)               | <b>0.87</b><br><b>(2.54)</b> |
| CH-4+Industry              | <b>1.35</b><br><b>(5.08)</b> | <b>0.34</b><br><b>(2.01)</b> |                              | <b>0.31</b><br><b>(2.59)</b> | 0.10<br>(0.60)               | <b>1.06</b><br><b>(3.01)</b> |
| CH-4+Geographic            | <b>1.62</b><br><b>(4.94)</b> | <b>0.77</b><br><b>(2.38)</b> | 0.46<br>(1.56)               |                              | 0.40<br>(1.52)               | <b>1.34</b><br><b>(3.02)</b> |
| CH-4+Technology            | <b>1.49</b><br><b>(4.63)</b> | <b>0.53</b><br><b>(2.05)</b> | 0.22<br>(1.09)               | <b>0.33</b><br><b>(2.90)</b> |                              | <b>1.28</b><br><b>(3.08)</b> |
| CH-4+Statistical           | <b>1.16</b><br><b>(4.17)</b> | 0.21<br>(0.81)               | 0.00<br>(0.01)               | <b>0.28</b><br><b>(2.24)</b> | 0.15<br>(0.63)               |                              |
| CH-4+Non_news              | <b>1.07</b><br><b>(4.57)</b> | <b>0.70</b><br><b>(3.66)</b> | <b>0.52</b><br><b>(3.05)</b> | <b>0.42</b><br><b>(2.64)</b> |                              |                              |

This table reports the intercept (or alpha) of regressing the time series of different long-short momentum returns on the CH-4 factors (*MKT*, *SMB*, *HML*, *PMO*) (Liu et al., 2019) plus each *MS* momentum spillover factor during sample periods of 2006–2020 and 2012–2020. Panel A reports the results of 2006–2020, while Panel B reports the results of 2012–2020. The concept momentum is excluded from this table since it is only available since 2016. The construction of the *MS* factor is given in Section 4.1. The column name indicates the type of long-short momentum return (i.e., the dependent variable), while the row name indicates the augmented CH-4 model (i.e., the original CH-4 model plus a specific *MS* factor). For example, the alphas in the row CH-4+Sentence\_3 are the alphas from the time-series regressions of long-short portfolio returns of other momentums on *MKT*, *SMB*, *HML*, *PMO*, and the Sentence\_3 factor. In the last row of each panel, we include all the five momentum spillover factors (concept momentum is excluded) that are not related to news as additional explanatory variables. For brevity, we only construct the news co-mention momentum factor based on *same\_sentence* type under the 3-month identification windows here. The industry momentum is based on the Shenwan-1 classification, while the geographic momentum is conducted on the province level. We do not consider the customer momentum due to the low data quality. The sample stocks include all listed stocks on the main board of the Shanghai Stock Exchange, Shenzhen Stock Exchange, and Growth Enterprise Market (GEM). ST shares are excluded. Newey and West (1987) adjusted *t*-statistics are shown in parentheses. Alphas with *t*-statistics higher than 2.00 are highlighted in bold.

**Table D.10**Factor spanning tests based on *same\_article* type news co-mention.

| Panel A: Alphas of factor spanning tests ( <i>same_article</i> type) |                       |                         |                         |                         |                         |                         |                        |                        |                        |                        |
|----------------------------------------------------------------------|-----------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|
|                                                                      | Article_3             | Article_6               | Article_9               | Article_12              | Analyst                 | Industry                | Geographic             | Technology             | Statistical            | Concept                |
| CH-4+Article_3                                                       |                       | −0.05<br>(−0.62)        | −0.14<br>(−1.23)        | −0.20<br>(−1.48)        | −0.44<br>(−1.82)        | −0.56<br>(−2.42)        | 0.24<br>(1.81)         | −0.33<br>(−1.51)       | 0.18<br>(0.49)         | −0.53<br>(−1.77)       |
| CH-4+Article_6                                                       | <b>0.25</b><br>(2.72) |                         | −0.09<br>(−1.36)        | −0.15<br>(−1.75)        | −0.39<br>(−1.74)        | −0.53<br>(−2.42)        | 0.25<br>(1.91)         | −0.32<br>(−1.46)       | 0.18<br>(0.54)         | −0.51<br>(−1.79)       |
| CH-4+Article_9                                                       | <b>0.41</b><br>(3.56) | <b>0.17</b><br>(2.60)   |                         | −0.07<br>(−1.24)        | −0.28<br>(−1.33)        | −0.43<br>(−2.06)        | 0.25<br>(1.97)         | −0.22<br>(−1.05)       | 0.23<br>(0.75)         | −0.42<br>(−1.49)       |
| CH-4+Article_12                                                      | <b>0.51</b><br>(3.74) | <b>0.27</b><br>(3.05)   | 0.10<br>(1.92)          |                         | −0.21<br>(−0.99)        | −0.37<br>(−1.76)        | <b>0.26</b><br>(2.07)  | −0.16<br>(−0.75)       | 0.27<br>(0.93)         | −0.29<br>(−0.99)       |
| CH-4+Analyst                                                         | <b>0.98</b><br>(4.85) | <b>0.78</b><br>(4.63)   | <b>0.67</b><br>(3.83)   | <b>0.60</b><br>(3.46)   |                         | 0.11<br>(0.76)          | 0.24<br>(1.83)         | 0.17<br>(0.99)         | <b>0.70</b><br>(2.18)  | 0.06<br>(0.28)         |
| CH-4+Industry                                                        | <b>1.13</b><br>(5.07) | <b>0.92</b><br>(4.98)   | <b>0.82</b><br>(4.30)   | <b>0.76</b><br>(4.10)   | 0.15<br>(0.96)          |                         | 0.25<br>(1.92)         | 0.14<br>(0.87)         | <b>0.78</b><br>(2.25)  | 0.33<br>(1.67)         |
| CH-4+Geographic                                                      | <b>1.35</b><br>(4.79) | <b>1.18</b><br>(4.47)   | <b>1.09</b><br>(3.90)   | <b>1.05</b><br>(3.75)   | <b>0.59</b><br>(2.21)   | <b>0.55</b><br>(2.26)   |                        | <b>0.44</b><br>(2.07)  | <b>1.05</b><br>(2.61)  | 0.34<br>(0.92)         |
| CH-4+Technology                                                      | <b>1.23</b><br>(4.59) | <b>1.04</b><br>(4.38)   | <b>0.95</b><br>(3.77)   | <b>0.91</b><br>(3.62)   | 0.34<br>(1.59)          | 0.27<br>(1.41)          | <b>0.27</b><br>(2.05)  |                        | <b>0.93</b><br>(2.50)  | 0.25<br>(0.98)         |
| CH-4+Statistical                                                     | <b>0.97</b><br>(4.04) | <b>0.74</b><br>(3.53)   | <b>0.60</b><br>(2.94)   | <b>0.50</b><br>(2.65)   | 0.20<br>(0.90)          | 0.23<br>(0.97)          | 0.23<br>(1.69)         | 0.25<br>(1.24)         |                        | 0.04<br>(0.14)         |
| CH-4+Concept                                                         | <b>1.06</b><br>(4.07) | <b>0.83</b><br>(3.94)   | <b>0.70</b><br>(3.45)   | <b>0.58</b><br>(2.91)   | 0.29<br>(1.30)          | −0.16<br>(−0.89)        | <b>0.35</b><br>(2.19)  | 0.04<br>(0.18)         | <b>0.92</b><br>(2.61)  |                        |
| CH-4+Non_news                                                        | <b>0.89</b><br>(3.50) | <b>0.70</b><br>(3.44)   | <b>0.51</b><br>(2.71)   | <b>0.40</b><br>(2.15)   |                         |                         |                        |                        |                        |                        |
| Panel B: CH-4+Article_3 factor loading ( <i>same_article</i> type)   |                       |                         |                         |                         |                         |                         |                        |                        |                        |                        |
|                                                                      | Article_3             | Article_6               | Article_9               | Article_12              | Analyst                 | Industry                | Geographic             | Technology             | Statistical            | Concept                |
| Article_3                                                            |                       | <b>0.931</b><br>(40.71) | <b>0.946</b><br>(28.88) | <b>0.962</b><br>(22.33) | <b>0.977</b><br>(14.25) | <b>0.895</b><br>(13.73) | <b>0.108</b><br>(4.00) | <b>0.654</b><br>(8.51) | <b>1.005</b><br>(9.84) | <b>0.911</b><br>(7.70) |
| mktrf                                                                |                       | −0.002<br>(−0.23)       | −0.004<br>(−0.24)       | −0.017<br>(−0.93)       | −0.081<br>(−3.49)       | −0.065<br>(−2.66)       | 0.012<br>(0.89)        | −0.031<br>(−1.40)      | −0.074<br>(−1.67)      | 0.006<br>(0.15)        |
| VMG                                                                  |                       | −0.018<br>(−0.87)       | −0.001<br>(−0.02)       | 0.005<br>(0.17)         | 0.004<br>(0.07)         | −0.014<br>(−0.20)       | −0.026<br>(−0.98)      | −0.049<br>(−0.70)      | 0.025<br>(0.22)        | 0.035<br>(0.40)        |
| SMB                                                                  |                       | 0.003<br>(0.16)         | 0.027<br>(0.90)         | 0.047<br>(1.32)         | 0.048<br>(0.76)         | 0.055<br>(0.83)         | −0.002<br>(−0.07)      | −0.029<br>(−0.52)      | 0.072<br>(0.63)        | 0.050<br>(0.57)        |
| PMO                                                                  |                       | −0.001<br>(−0.05)       | −0.005<br>(−0.27)       | −0.019<br>(−0.75)       | −0.064<br>(−1.59)       | −0.021<br>(−0.47)       | −0.017<br>(−1.05)      | −0.049<br>(−1.26)      | −0.185<br>(−2.15)      | 0.093<br>(1.05)        |
| Adj. R2                                                              |                       | 0.876                   | 0.823                   | 0.785                   | 0.538                   | 0.492                   | 0.072                  | 0.328                  | 0.361                  | 0.412                  |
| # Obs.                                                               |                       | 464                     | 464                     | 464                     | 464                     | 464                     | 464                    | 464                    | 464                    | 227                    |

Panel A reports the intercept (or alpha) of regressing the time series of different long–short momentum returns on the CH-4 factors (*MKT*, *SMB*, *HML*, *PMO*) (Liu et al., 2019) plus each *MS* momentum spillover factor. The construction of the *MS* factor is given in Section 4.1. The column name indicates the type of long–short momentum return (i.e., the dependent variable), while the row name indicates the augmented CH-4 model (i.e., the original CH-4 model plus a specific *MS* factor). For example, the alphas of the row CH-4+Article\_3 indicate the alphas from the time-series regressions of long–short portfolio returns of other momentums on *MKT*, *SMB*, *HML*, *PMO* and the Article\_3 factor. In the last row of panel A, we include all the six momentum spillover factors that are not related to news as additional explanatory variables. News co-mention momentum factors are based on *same\_article* type under identification windows including 3-month, 6-month, 9-month, and 12-month. The industry momentum is based on the Shenwan-1 classification, while the geographic momentum is conducted on the province level. We do not consider the customer momentum due to the low data quality. The sample stocks include all listed stocks on the main board of the Shanghai Stock Exchange, Shenzhen Stock Exchange, and Growth Enterprise Market (GEM). ST shares are excluded. The sample period of news co-mention momentum is 2012–2020. The sample period of concept momentum is Aug. 2016–2020. The sample periods for other momentums are 2006–2020. Newey and West (1987) adjusted *t*-statistics are shown in parentheses. Alphas with *t*-statistics higher than 2.00 are highlighted in bold. Panel B reports the factor loads of other momentum spillover factors on the CH-4+Article\_3 model. Coefficients with *t*-statistics higher than 2.00 are highlighted in bold.

**Table D.11**

Factor spanning tests based on news co-mention momentum weighted by firm size.

| Panel A: Alphas of factor spanning tests (co-mention link weighted by firm size) |                       |                       |                       |                       |                       |                       |                       |                       |                       |                  |
|----------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------|
|                                                                                  | Sentence_3            | Sentence_6            | Sentence_9            | Sentence_12           | Analyst               | Industry              | Geographic            | Technology            | Statistical           | Concept          |
| CH4+Sentence_3                                                                   |                       | −0.06<br>(−0.69)      | −0.07<br>(−0.70)      | −0.10<br>(−0.96)      | −0.46<br>(−1.63)      | −0.52<br>(−1.89)      | 0.24<br>(1.92)        | −0.24<br>(−0.97)      | 0.12<br>(0.28)        | −0.56<br>(−1.71) |
| CH4+Sentence_6                                                                   | <b>0.32</b><br>(2.87) |                       | 0.00<br>(0.01)        | −0.03<br>(−0.41)      | −0.40<br>(−1.50)      | −0.48<br>(−1.81)      | <b>0.27</b><br>(2.16) | −0.21<br>(−0.85)      | 0.18<br>(0.45)        | −0.52<br>(−1.77) |
| CH4+Sentence_9                                                                   | <b>0.42</b><br>(3.37) | 0.10<br>(1.52)        |                       | −0.03<br>(−0.66)      | −0.36<br>(−1.39)      | −0.46<br>(−1.84)      | <b>0.26</b><br>(2.09) | −0.22<br>(−0.93)      | 0.15<br>(0.40)        | −0.52<br>(−1.73) |
| CH4+Sentence_12                                                                  | <b>0.51</b><br>(3.84) | <b>0.19</b><br>(2.27) | 0.09<br>(1.88)        |                       | −0.28<br>(−1.08)      | −0.40<br>(−1.55)      | <b>0.27</b><br>(2.21) | −0.16<br>(−0.68)      | 0.24<br>(0.63)        | −0.46<br>(−1.54) |
| CH4+Analyst                                                                      | <b>1.15</b><br>(5.13) | <b>0.81</b><br>(4.86) | <b>0.74</b><br>(4.45) | <b>0.66</b><br>(4.09) |                       | 0.11<br>(0.76)        | 0.24<br>(1.83)        | 0.17<br>(0.99)        | <b>0.70</b><br>(2.18) | 0.06<br>(0.28)   |
| CH4+Industry                                                                     | <b>1.30</b><br>(5.20) | <b>0.96</b><br>(5.04) | <b>0.88</b><br>(4.83) | <b>0.79</b><br>(4.44) | 0.15<br>(0.96)        |                       | 0.25<br>(1.92)        | 0.14<br>(0.87)        | <b>0.78</b><br>(2.25) | 0.33<br>(1.67)   |
| CH4+Geographic                                                                   | <b>1.51</b><br>(5.10) | <b>1.20</b><br>(5.03) | <b>1.11</b><br>(4.64) | <b>1.02</b><br>(4.42) | <b>0.59</b><br>(2.21) | <b>0.55</b><br>(2.26) |                       | <b>0.44</b><br>(2.07) | <b>1.05</b><br>(2.61) | 0.34<br>(0.92)   |
| CH4+Technology                                                                   | <b>1.42</b><br>(4.94) | <b>1.08</b><br>(4.74) | <b>1.00</b><br>(4.52) | <b>0.91</b><br>(4.24) | 0.34<br>(1.59)        | 0.27<br>(1.41)        | <b>0.27</b><br>(2.05) |                       | <b>0.93</b><br>(2.50) | 0.25<br>(0.98)   |
| CH4+Statistical                                                                  | <b>1.12</b><br>(4.38) | <b>0.78</b><br>(4.01) | <b>0.69</b><br>(3.84) | <b>0.60</b><br>(3.54) | 0.20<br>(0.90)        | 0.23<br>(0.97)        | 0.23<br>(1.69)        | 0.25<br>(1.24)        |                       | 0.04<br>(0.14)   |

(continued on next page)

Table D.11 (continued).

|                                                                                |                       |                         |                         |                         |                         |                         |                        |                        |                        |                        |
|--------------------------------------------------------------------------------|-----------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|
| CH4+Concept                                                                    | <b>1.28</b><br>(4.31) | <b>0.87</b><br>(4.38)   | <b>0.85</b><br>(4.18)   | <b>0.72</b><br>(3.79)   | 0.29<br>(1.30)          | −0.16<br>(−0.89)        | <b>0.35</b><br>(2.19)  | 0.04<br>(0.18)         | <b>0.92</b><br>(2.61)  |                        |
| CH4+Non_news                                                                   | <b>1.04</b><br>(4.65) | <b>0.73</b><br>(4.41)   | <b>0.63</b><br>(4.03)   | <b>0.55</b><br>(3.65)   |                         |                         |                        |                        |                        |                        |
| Panel B: CH4+Sentence_3 factor loading (co-mention link weighted by firm size) |                       |                         |                         |                         |                         |                         |                        |                        |                        |                        |
|                                                                                | Sentence_3            | Sentence_6              | Sentence_9              | Sentence_12             | Analyst                 | Industry                | Geographic             | Technology             | Statistical            | Concept                |
| Sentence_3                                                                     |                       | <b>0.841</b><br>(29.73) | <b>0.805</b><br>(27.64) | <b>0.758</b><br>(23.91) | <b>0.913</b><br>(13.56) | <b>0.805</b><br>(10.31) | <b>0.095</b><br>(4.23) | <b>0.547</b><br>(6.86) | <b>0.963</b><br>(8.69) | <b>0.816</b><br>(7.27) |
| mktrf                                                                          |                       | −0.009<br>(−0.83)       | −0.010<br>(−0.81)       | −0.012<br>(−0.96)       | −0.070<br>(−3.00)       | −0.055<br>(−2.13)       | 0.013<br>(0.94)        | −0.025<br>(−1.04)      | −0.061<br>(−1.45)      | −0.008<br>(−0.20)      |
| VMG                                                                            |                       | −0.015<br>(−0.55)       | −0.012<br>(−0.42)       | −0.005<br>(−0.18)       | −0.020<br>(−0.31)       | −0.035<br>(−0.50)       | −0.029<br>(−1.07)      | −0.062<br>(−0.89)      | −0.002<br>(−0.02)      | 0.023<br>(0.24)        |
| SMB                                                                            |                       | 0.015<br>(0.74)         | 0.024<br>(0.91)         | 0.037<br>(1.55)         | 0.049<br>(0.76)         | 0.059<br>(0.89)         | −0.001<br>(−0.03)      | −0.021<br>(−0.35)      | 0.070<br>(0.63)        | 0.031<br>(0.34)        |
| PMO                                                                            |                       | −0.015<br>(−1.14)       | −0.016<br>(−1.23)       | −0.021<br>(−1.38)       | −0.065<br>(−1.68)       | −0.020<br>(−0.47)       | −0.017<br>(−1.03)      | −0.048<br>(−1.26)      | −0.186<br>(−2.43)      | 0.077<br>(0.83)        |
| Adj. R2                                                                        |                       | 0.850                   | 0.802                   | 0.768                   | 0.481                   | 0.409                   | 0.059                  | 0.235                  | 0.339                  | 0.361                  |
| # Obs.                                                                         |                       | 464                     | 464                     | 464                     | 464                     | 464                     | 464                    | 464                    | 464                    | 227                    |

Panel A reports the intercept (or alpha) of regressing the time series of different long-short momentum returns on the CH-4 factors (*MKT*, *SMB*, *HML*, *PMO*) (Liu et al., 2019) plus each *MS* momentum spillover factor. The construction of the *MS* factor is given in Section 4.1. The column name indicates the type of long-short momentum return (i.e., the dependent variable), while the row name indicates the augmented CH-4 model (i.e., the original CH-4 model plus a specific *MS* factor). For example, the alphas of the row CH-4+Sentence\_3 indicate the alphas from the time-series regressions of long-short portfolio returns of other momentums on *MKT*, *SMB*, *HML*, *PMO*, and the Sentence\_3 factor. In the last row of panel A, we include all the six momentum spillover factors that are not related to news as additional explanatory variables. News co-mention momentum factors are based on *same\_sentence* type under identification windows including 3-month, 6-month, 9-month, and 12-month. We change the weighting method to floating market value weighting instead of co-mention times weighting. The industry momentum is based on the Shenwan-1 classification, while the geographic momentum is conducted on the province level. We do not consider the customer momentum due to the low data quality. The sample stocks include all listed stocks on the main board of the Shanghai Stock Exchange, Shenzhen Stock Exchange, and Growth Enterprise Market (GEM). ST shares are excluded. The sample period of news co-mention momentum is 2012–2020. The sample period of concept momentum is Aug. 2016–2020. The sample periods for other momentums are 2006–2020. Newey and West (1987) adjusted *t*-statistics are shown in parentheses. Alphas with *t*-statistics higher than 2.00 are highlighted in bold. Panel B reports the factor loads of other momentum spillover factors on the CH-4+Sentence\_3 model. Coefficients with *t*-statistics higher than 2.00 are highlighted in bold.

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