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Do Insiders Trade on Government Subsidies?

Hanwen Sun
School of Management
University of Bath
E-mail: h.sun@bath.ac.uk

Kangtao Ye
Renmin Business School
Renmin University of China
E-mail: yekangtao@rmba.ruc.edu.cn

Cheng (Colin) Zeng*
School of Accounting and Finance
Hong Kong Polytechnic University
E-mail: chengzeng@polyu.edu.hk

ABSTRACT

We examine whether and how insiders trade on government subsidies, a major instrument through which the governments intervene in the economy. Using a novel dataset of government subsidies of Chinese listed firms, we find that net insider purchase increases significantly during the month of subsidy receipt. The effect of subsidies on insider trading is weaker in firms with a more transparent information environment and when subsidies are granted in a more predictable manner. In contrast, the effect is more pronounced for politically connected firms. Further analysis shows that the subsidy-trading relation may reflect both insiders' informational advantage concerning subsidies and their superior ability to detect mispricing-related opportunities. Our findings provide new insights into the capital market consequences of government subsidies through the lens of insider trading.

Keywords: Insider trading; Government subsidy; Information transparency; Political connection

JEL classification: G14, G18, H25, H71

* Corresponding author. Postal Address: The Hong Kong Polytechnic University, School of Accounting and Finance, 7/F Ka Shing Tower, Hung Hom, Kowloon, Hong Kong. We appreciate the helpful comments from Marco Trombetta (the editor), two anonymous reviewers, Maria Cecilia Bustamante, Chris Brooks, Murrillo Campello, Bin Ke, Clive Lennox, Qingyuan Li, Hongfeng Peng, Ron Masulis, Chao Yin, Liao Ke, and workshop participants at the 2019 EAA, 2019 FMA (Europe), University of Reading, Wuhan University, and Shandong University of Finance and Economics. Sun acknowledges financial support from the British Academy (Project No. NMG2R3\100018). Ye acknowledges financial support from the National Natural Science Foundation of China (Project No. 71872176, 71790602). Zeng acknowledges financial support from the National Natural Science Foundation of China (Project No. 19AJY027) and the start-up fund of Hong Kong Polytechnic University (P0035237). All remaining errors are our own.

1. Introduction

China has created an economic success since the “reform and opening door” policy in the late 1970s, becoming the second largest economy in the world. A key feature of China’s economic model is that governments intervene extensively in business activities through government subsidies. According to the Financial Times, subsidies received by Chinese listed companies amounted to RMB 153.8 billion (U.S.\$22.3 billion) in 2018.¹ Alongside the economic reform, China has imitated or even copied a number of capital market regulations from Western countries including insider trading laws. However, insider trading on government subsidy, despite its pivotal role in China’s economy and firm growth, is yet outlawed. An interesting, but unexamined, question is whether corporate insiders trade on such information and if yes, how they trade on it. Our study seeks to fill this literature void.

Insiders face a trade-off between the benefits and costs of trading on government subsidies. On the one hand, firms that receive subsidies may be viewed as being endorsed by or politically connected with the government, thus experiencing lower levels of financial constraint and bankruptcy risk as well as having lower prosecution risk due to corporate misconduct (Callahan et al., 2012; Lim et al., 2018; Jagolinzer et al., 2020). With the receipt of subsidies being favorable news, it is reasonable to predict that insiders will increase their purchases around the time of such announcements. On the other hand, there is a growing literature that examines the role of public scrutiny in restraining insider trading (e.g., Dai et al., 2015; Rogers et al., 2016). As a major form of wealth redistribution, government subsidies are increasingly likely to provoke a public outcry and are subject to greater scrutiny, and therefore exacerbate the political costs faced by subsidized firms (Lee et al., 2017; Pappas et al., 2021). These political-cost considerations may inhibit managers from engaging in opportunistic insider trading.

¹ See <https://www.ft.com/content/e2916586-8048-11e9-b592-5fe435b57a3b>.

Giving these competing arguments, whether insiders trade on government subsidies remains an open empirical question.

China provides us with a unique setting in which to test our research question. Unlike in most countries, where disclosure rules on subsidies are absent, in China subsidy recipients are required to issue interim announcements on a timely basis if the subsidies received are considered to have had a material impact on their operations (see detailed discussion in Section 2.1).² This disclosure rule offers us an opportunity to investigate whether insiders place any trades around the time of receipt of government subsidies.

Based on 3,032 manually collected interim subsidy announcements covering 1,203 unique Chinese listed firms, we begin by estimating the cumulative abnormal returns (CARs) around the subsidy-receipt dates. Across different event windows, the CARs are significantly positive, suggesting that government subsidies are value-relevant and insiders can, therefore, make abnormal profits by exploiting this trading opportunity. Furthermore, our baseline regression results show that, in months of subsidy receipt, net insider purchases increase significantly, by 0.04-0.05% of the total number of shares outstanding, compared to those in other months. The economic magnitude is also sizable, given that the mean of the net purchases is 0.02% of the total number of shares outstanding. This suggests a strong tendency for insiders to trade on subsidy information. The results are robust to the inclusion of a set of control variables, firm fixed effects, and year-month fixed effects.

We next perform several cross-sectional analyses based on the heterogeneous benefits and costs of trading on subsidies. First, we explore the role of the corporate information environment in the subsidy-trading relation, because insider-trading behavior can be shaped by firms' information transparency (Frankel and Li, 2004). We measure such transparency

² For instance, in the U.S. GAAP, there are no disclosure requirements regarding government subsidies (Stadler and Nobes, 2018).

according to two major financial intermediaries: the news media and security analysts. Recent evidence consistently suggests that the media plays an important part in the price-formation process through its dissemination and disciplining roles (Dai et al., 2015; Rogers et al., 2016). Our empirical evidence shows that insiders in firms with higher levels of media exposure are less likely to engage in informed trading during the months in which they receive subsidies. In a similar vein, security analysts serve an important role in their capacity as public-information providers. A higher degree of analyst following is associated with a more transparent information environment (Chen et al., 2020). In line with this reasoning, our results support the notion that analyst coverage restrains insiders from trading on subsidies. Collectively, these findings suggest that external discipline from financial intermediaries plays a role in constraining insiders' trading on subsidy information.

Second, we examine whether the subsidy-trading relation is contingent on the predictability of received subsidies. When subsidies are awarded on a regular basis, insiders will be less likely to make abnormal profits by exploiting the information, because such information would already have been incorporated into stock prices. Accordingly, insiders should be discouraged from engaging in informed trading. To test this prediction, we split our sample into those firms receiving regular subsidies and those receiving them sporadically, and we find that the positive association between government subsidies and insider trading is, indeed, more pronounced when subsidies are granted in a less predictable manner.

Finally, we examine whether the subsidy-trading relation varies between politically connected and unconnected firms. Jagolinzer et al. (2020) suggest that insiders are more likely to engage in informed trading if they believe that their political connections can provide them with some protection against any subsequent prosecution. Consistent with their findings, our results show that the subsidy-trading relation is more pronounced in politically connected firms than in their unconnected counterparts. On a similar note, we find that the positive relation

between government subsidies and insider trading is stronger in state-owned enterprises (SOEs) than in non-SOEs.

There are two possible but not mutually exclusive channels through which government subsidies can affect insider trading. First, insiders may have information advantages concerning forthcoming subsidies. Although, unlike other corporate events, the granting of subsidies is not fully controlled by insiders, there is often a lengthy and opaque application process that firms must undertake, in which insiders may gain access to privileged information regarding the likelihood and timing of subsidy receipt. Second, insiders may have a superior ability to detect the mispricing of subsidy information. We conduct two additional tests in relation to these channels. First, Cohen et al. (2012) suggest that opportunistic insider trades are more likely to be driven by the exploitation of private information, while routine trades are more likely to be due to reasons of diversification or liquidity. Thus, we follow Cohen et al. (2012) in differentiating between opportunistic and routine transactions. Our results show that the positive relation between government subsidies and insider trading exists only with opportunistic trades, consistent with the channel of informational advantage. Second, we test the mispricing channel by examining whether subsidies can predict a firm's future stock returns. Our results show that subsidies are positively associated with one-month-ahead stock returns, implying that subsidies are relatively underpriced and therefore generate opportunities from such mispricing.

One might be concerned that our results could be dogged by endogeneity problems, because there may be some unobserved firm characteristics that simultaneously drive both insider-trading behavior and a firm's likelihood of being subsidized. However, this concern should be relatively minor given our underlying identification strategy. First and foremost, the objective of our study is to test whether insiders exploit subsidy-related information. To this end, we employ event-specific regressions that capture the changes in insider trades within a

short window surrounding subsidy announcements. Moreover, the inclusion of firm fixed effects should alleviate any endogeneity caused by time-invariant firm characteristics. In other words, our identification compares within-firm changes in the trading behavior of insiders during the months in which firms receive subsidies. To further enhance our identification, we use a coarsened exact matching (CEM) approach to circumvent the concern that the subsidy-trading relation might be confounded by differences in observable covariates between subsidized and unsubsidized firms. Our results continue to hold when we use samples matched by that approach.

Our paper contributes to the literature in several ways. First, to the best of our knowledge, our study is the first to link insider trading with government subsidies. While numerous studies have provided compelling evidence that insiders trade around major firm-initiated events (e.g., John and Lang, 1991; Karpoff and Lee, 1991; Seyhun and Bradley, 1997; Kahle, 2000; Ke et al., 2003; Piotroski and Roulstone, 2005), very little is known about whether government intervention through the distribution of subsidies generates additional trading opportunities for insiders. Moreover, existing studies focus overwhelmingly on insider-trading behavior in market economies, in which insiders can be disciplined by corporate governance mechanisms and legal enforcement. Much less attention has been paid to emerging economies, wherein the government, rather than the free market, plays a dominant role in controlling and distributing critical resources. Therefore, our paper contributes significantly to the literature on this latter aspect.

Second, our study adds to an emerging body of research on government subsidies. Most prior studies have focused on the economic outcomes of such subsidies, including investment efficiency (Jin and Zhang, 2019), innovation (Fang et al., 2019), corporate fraud (Raghunandan, 2021), and the cost of debt (Lim et al., 2018). In addition, there is a burgeoning literature on the influence of subsidies on corporate-disclosure behavior, which documents that subsidies

increase the propensity for voluntary corporate disclosure (Lee et al., 2017; Huang, 2020), and incentivize managers to engage in income smoothing (Pappas et al., 2021). However, the capital-market consequences of government subsidies have hitherto been far less studied. Our results shed further light on the fact that government subsidies have, through the lens of corporate insiders, valuation implications for capital-market participants.

Although, as a caveat, our focus on China may potentially limit the generalizability of our findings, our work does have important implications for other countries given the rising protectionism of the past decade.³ Despite the growing pervasiveness of subsidies, firms are generally not required to disclose subsidy information to the public, providing insiders with a convenient opportunity to reap private benefits by trading on such non-public information. In light of this, the Financial Accounting Standards Board (FASB) in the US has recently issued a proposed Accounting Standards Update, ‘*Disclosures by Business Entities About Government Assistance*’, which requires companies to disclose the details of government subsidy grants. Our findings validate such recent regulatory efforts on the part of accounting standards setters.

The rest of the paper proceeds as follows. Section 2 discusses the institutional background. Section 3 develops our hypotheses. Section 4 describes the data, sample, and methods. Section 5 reports the main findings. Section 6 presents further analyses. Section 7 concludes the paper.

2. Institutional Background

2.1. Chinese government subsidies

³ According to a 2012 Cato Institute study, the US government spends \$100 billion on subsidies annually; likewise, as revealed by an article in *The Guardian* in 2015, the UK government hands out huge corporate subsidies, amounting to £93 billion a year. See <https://www.cato.org/cato-handbook-policymakers/cato-handbook-policy-makers-8th-edition-2017/special-interest-spending> and <https://www.theguardian.com/politics/2015/jul/07/corporate-welfare-a-93bn-handshake>.

Subsidies are employed as a policy instrument for three primary reasons. First, governments may use subsidies to *offset various market imperfections*, given that the “invisible hand” of the free market is not sufficient to ensure efficient resource allocation. Second, governments may utilize subsidies to *obtain economies of scale in production* and thereby help nascent firms to compete in a global marketplace with larger competitors. Last, governments may use subsidies to *accomplish their social policy objectives*, such as a more equitable distribution of income or a higher employment rate.

Despite the efforts to move toward a more market-oriented economy, China is still different from a traditional market economy in many respects (Naughton, 2017).⁴ For instance, the Chinese government maintains much more influence over the economy than governments in other middle-income or developed countries. State ownership remains prominent. Government five-year plans command attention. In this system, subsidies serve as a major instrument for facilitating government intervention in the market; not surprisingly, the Chinese government has provided massive subsidies to both industries and individual firms. For instance, according to *The Wall Street Journal* (2013), Chinese listed firms received \$13.83 billion in government subsidies in 2012, 23% up on 2011.⁵ Such subsidies were equivalent to more than 4% of the companies’ total profits in 2012, up from around 3% in the period between 2009 and 2011.⁶ As a consequence, many global competitors have threatened retaliation for what they view as unfair trade practices. For instance, subsidies have been a focal point during the recent trade war between the US and China, with the US government repeatedly accusing China of violating trade rules by providing subsidies to boost exports.⁷

⁴ The Chinese government refers to its economic system as “market socialism with Chinese characteristics”.

⁵ See <https://www.wsj.com/articles/SB10001424127887323836504578551474072138676>.

⁶ Haley and Haley (2013) estimated the dollar value of subsidies provided to some key industries. For example, Chinese auto parts businesses received subsidies worth \$28 billion between 2001 and 2011; the Chinese government has promised to provide an additional \$10.9 billion in subsidies to this industry by 2020.

⁷ In the most recent trade war between the US and China, President Trump complained that China had gained an unfair advantage through “illegal export subsidies” and threatened to hit all \$505 billion of Chinese imports with tariffs. See <https://www.wsj.com/articles/in-trumps-china-industrial-subsidies-loom-large-1479270824>.

To be considered for funding, a firm needs to file an application that is reviewed at various levels of government. Take for example the R&D subsidies: all applications are initially filed at the municipal level, and higher-level applications need the approval of lower-level technology bureaus. For instance, a provincial application will only be submitted and considered if the officials in the municipal technology bureau approve and endorse the application. To the extent that local officials play an important role as gate keepers and referees of firms' applications for subsidies, firms with good relationships with the government will have a higher chance of success in subsidy applications.⁸ As such, how corporate insiders engage policymakers tends to be opaque and unobservable to outsiders, providing insiders with opportunities to trade on subsidy information.

China's government subsidies have not only triggered international dispute, but also invited public discontent domestically. This is especially the case when subsidies are granted to private firms whose profits are largely retained in the hands of wealthy individuals instead of being redistributed to the public. This gives the public the impression that the state is using public money to prop up wealthy individuals, further enriching the already rich.⁹ Pervasive subsidies and a growing public outcry have created increasing pressure for subsidy recipients to be more transparent (Lee et al., 2017). Consequently, since 2007, Chinese listed firms have been required to disclose, in the notes of their annual reports, the type and value of subsidies received from various government agencies.¹⁰ Meanwhile, firms are also expected to issue

⁸ It is also possible that firms use bribery to cultivate good relationships with government officials. However, since 2012, China has launched a far-reaching anti-corruption campaign. The number of officials formally investigated for corruption charges under the campaign had reached more than 2 million as of 2018 (Hao et al., 2020). Thus, in our sample period (i.e., 2015-2017), firms are much less likely to have obtained subsidies using corruption (Fang et al., 2019).

⁹ There has been much criticism of corporate subsidies from Chinese journalists and commentators, including those from the *People's Daily*, which is the official Communist Party mouthpiece. See, for example, <http://finance.people.com.cn/stock/n/2014/0911/c67815-25639447.html> (in Chinese).

¹⁰ While most subsidies are reported quite openly, the actual total is unobservable, because a proportion is granted in the form of non-monetary support, such as price subsidies or land grants, which are not typically reported in companies' financial statements. Hence, our subsidy variables are likely to be underestimated, which will only serve to make it harder for us to detect significant results.

interim announcements when receiving subsidies that will have a material impact on their revenues. Appendix A provides two examples of such announcements.

Because the materiality of such subsidies was not clearly defined by the regulators at first, very few firms made interim subsidy announcements before 2015. In September 2014, the China Securities Regulatory Commission (CSRC) publicly expressed its concern over listed firms' inadequate disclosure, with particular reference to government subsidies. By the end of 2017, both the Shenzhen and Shanghai Stock Exchanges had revised the disclosure rules to precisely define the materiality of reportable subsidies. For instance, for firms listed on the Main Board, subsidy recipients are supposed to issue announcements in a timely manner if income-related subsidies account for more than 10% of their net profit and exceed 1 million yuan (approximately \$145k), or if asset-related subsidies account for more than 10% of net assets and have a value in excess of 10 million yuan.¹¹

2.2. Insider-trading regulation and enforcement in China

China's stock market is still young, with the two stock exchanges—Shenzhen and Shanghai—having been established only in the early 1990s. Despite their short history, China's stock markets have made remarkable progress in the past three decades. By the end of 2019, they had a combined market capitalization of over 8,515 billion US dollars, making China the second-largest securities market in the world.

China has a set of regulations on securities issuing and trading, including insider trading. The main provisions on insider trading are stipulated in the *Securities Law of the People's Republic of China* (the *Securities Law* hereafter), and the CSRC regulates the exchanges and enforces insider-trading laws. According to the *Securities Law*, corporate insiders include

¹¹ China's stock market consists of three boards: the Main Board is aimed at larger enterprises in terms of market or asset value; the Small-and-Medium Enterprise Board is aimed at middle-sized enterprises, and the Growing Enterprise Board is aimed at smaller enterprises, fast-growing enterprises, and innovative enterprises. Firms listed on the different boards are subject to different regulatory requirements.

directors, supervisors, senior administrative officers, and any shareholder who holds 5% or more of the outstanding shares. Article 75 of the *Securities Law* specifies insider information as any undisclosed news that may influence share prices, such as news of restructuring, mergers and acquisitions, abnormal earnings and dividend announcements, and changes in the board of directors. Despite their value-relevant nature, news of government subsidies has not been included in this list, which leaves insiders with a convenient window of opportunity for reaping personal benefits.¹²

The two stock exchanges have implemented their own insider-trading rules. For instance, these rules forbid insiders from trading during the 30 days preceding the release of periodic reports such as annual, interim, and quarterly financial reports, and during the 10 days before earnings preannouncements. They also prohibit trading during the two days following the release of any price-sensitive corporate news. As with US regulation, there is a six-month trading rule for short-term trading profits. Any capital gains insiders make on price swings within six months have to be repaid to the company. Any individual or corporation that makes false statements or fails to make timely notifications will be fined by the stock exchanges.

Historically, China has a poor track record in enforcing insider-trading regulations. The reasons for this include regulatory resource constraints, difficulties in detecting insider trading, the uneven competence and independence of regulatory bodies, and—of overwhelming importance in China’s context—the political connections of the violators (Howson, 2013). However, recent evidence suggests that China is expanding its efforts to regulate insider trading. Over the period 1991-2017, the CSRC and the courts investigated 268 cases, with a substantial

¹² A feature of China’s insider trading law is its extensive use of overseas experience, particularly from the US (Huang, 2020). Indeed, in drafting its *Securities Law* China received direct assistance from the US. The advanced overseas experience provided China with a good starting point for enacting its securities regulations and significantly reduced its legislative costs. However, a cost of closely following the US legislation is that some inside information that is unique to China may have been neglected during the law-making process. Government subsidies are an example. According to Fang et al. (2019), the percentage of Chinese listed firms receiving subsidies increased steadily from 70% in 2008 to 95% in 2015. In contrast, only 10% of US listed firms received subsidies over the period of 1996-2016 (Pappas et al., 2021). Given the above, we think subsidy information has been left out of China’s insider trading regulations largely unintentionally.

number of those, 231, occurring since 2011¹³ (Huang, 2020). Furthermore, in recent years, there has been a trend toward imposing pecuniary sanctions equal to a higher proportion of illegal proceeds, also suggesting China is becoming increasingly tough at regulating insider trading.¹⁴

3. Hypothesis Development

The previous literature consistently suggests that insiders take advantage of profitable trading opportunities (e.g., Jaffe, 1974; Seyhun, 1986; Rozeff and Zaman, 1988; Bettis et al., 2000; Lakonishok and Lee, 2001; Fidrmuc et al., 2006). A government subsidy is one such opportunity that is exploitable by insiders. Although, unlike many other corporate events, the granting of subsidies is not fully controlled by insiders, there is often a lengthy and opaque subsidy application process that firms must undertake, in which insiders may gain access to privileged information regarding the likelihood and timing of subsidy receipt (e.g., Fang et al., 2019). Receiving subsidies is generally interpreted as favorable news for several reasons. First, government subsidies can directly increase the receiving firms' current or future cash flows, and therefore alleviate their financial constraints (Lee et al., 2014). Second, subsidies may have indirect endorsement effects, which enable the receiving firms to obtain exclusive licenses, guaranteed access to special projects, and resources such as cheap bank loans (Lerner, 2000; Meuleman and Maeseneire, 2012; Lim et al., 2018). Moreover, since whether a firm can receive a government subsidy hinges at least partially on the relationship between the government and the firm, the receipt of subsidies carries a certification signal to investors that the receiving firm has good prospects and less uncertainty since it has government backing (Lerner, 2002). In

¹³ More than half of the insider-trading cases are related to inside information concerning mergers and acquisitions. The second-largest category of inside information concerns major contracts or investments, and accounts for 25% of the cases (Huang, 2020).

¹⁴ The mean ratio of pecuniary penalties to illegal proceeds increased from 116.94% in 1991 to 313.28% in 2017 (Huang, 2020).

other words, what may be triggering the observed insider trading related to subsidy announcements is not only the subsidy itself, but also the signals the subsidy-receiving firms convey to the market.

Moreover, prior literature associates insider trading activities with mispricing and the view that insiders make a trading profit through their superior skills in interpreting public information (e.g., Baker and Wurgler, 2002; Jenter, 2005).¹⁵ In our context, government subsidies can also affect insider trading via perceived mispricing. For instance, using Chinese data, Luo et al. (2019) find that the stock market tends to underreact to contemporaneous subsidy information, leading to mispricing opportunities. Given that a government subsidy is a piece of positive and value-relevant information, insiders are likely to make a profit by exploiting the knowledge. Thus, we formulate the following hypothesis:

H1: Government subsidies are positively associated with insider-purchase activities.

We then examine how the predicted effect varies cross-sectionally. First, we consider how the effect changes according to a firm's level of information transparency. High information transparency reduces the relative value of insiders' information by increasing the quality of outsiders' information. In a more transparent information environment, the market's beliefs about a firm's value become less divergent (Gu and Li, 2012). Similarly, Frankel and Li (2014) find that both information collection by outsiders and firms' timely disclosure of value-relevant information limit insiders' abilities to trade profitably. In other words, corporate transparency improves market efficiency and price discovery, which in turn prevents insiders

¹⁵ For instance, Veenman (2013) provides evidence that positive abnormal returns following insider share purchases reflect both private information and managers' responses to the market mispricing of public information. Other studies have identified specific situations in which insider trades are driven by market mispricing; for example, Core et al. (2006) find insider-trading activities to be associated with trading strategies based on the accrual anomaly. Similarly, Kolasinski and Li (2010) show that insiders benefit from investors' underreaction to earnings announcements, while Ali et al. (2011) find that insiders are responding to mispricing that has resulted from price pressure induced by mutual funds.

from making trading profits. To the extent that the benefits of insider trading are positively related to the level of information contained in the news, we expect that insiders are less likely to trade on government subsidies if firms are more transparent. Accordingly, our hypothesis is:

H2: Insiders are less likely to trade on government subsidies when a firm's information environment is more transparent.

Insiders are expected to gain larger benefits when they have access to information that is not fully reflected in stock prices (e.g., Cohen et al., 2012; Kolasinski and Li, 2010). As such, the relation between government subsidies and insider trading should be conditional on the predictability of the subsidies received. When subsidies are awarded on a more predictable basis, the information gap between insiders and outsiders concerning those subsidies should be reduced. Moreover, more predictable subsidies cause a decrease in insiders' information monopolies and an increase in the incorporation of subsidy information into stock prices, thus reducing the likelihood that insiders can make abnormal profits on the basis of the subsidy information. Hence, we formulate the following hypothesis:

H3: Insiders are less likely to trade on government subsidies when such subsidies are more predictable.

Prior studies have revealed that firms use political connections to gain favorable treatment, such as being exempted from an investigation or receiving lower penalties from regulatory agencies. For instance, Yu and Yu (2011) find that politically connected firms have a significantly lower hazard rate in relation to fraud detection. Similarly, Correia (2014) provides evidence consistent with such firms having a lower probability of fraud detection by the US Securities and Exchange Commission (SEC) and receiving lower penalties. More recent work links political connections with insider trading, showing that executives in politically

connected firms are more likely to engage in it (Jagolinzer et al., 2020). Because politically connected insiders believe that their connections can provide them with protection against prosecution, the litigation costs they perceive could result from insider trades are lower than those perceived by unconnected insiders. As such, we predict that:

H4: Insiders in politically connected firms are more likely to trade on government subsidies than those in firms without such connections.

We are aware that there are several reasons why we may not be able to observe insider trading on government subsidies. First, the political cost hypothesis posits that the fear of public scrutiny motivates firms to either hide their profits (Pappas et al., 2021) or improve their *apparent* transparency (Huang, 2020). As a major form of wealth redistribution, government subsidies are likely to provoke a public outcry, and thereby exacerbate the potential political costs facing subsidized firms (Lee et al., 2017), encouraging firms to improve transparency.

Second, as discussed in the previous section, corporate subsidies have attracted widespread attention from the media and some watchdog organizations. It is possible that insiders of subsidized firms will behave more ethically to avoid any possible backlash. Mills et al. (2013) provide corroborative evidence that firms that face higher political costs are less likely to engage in tax avoidance. Third, unethical behavior by subsidized firms may put pressure on their relationships with the politicians who supported their subsidization. This is particularly true in the light of China's anti-corruption campaign.¹⁶ To the extent that the allocation of government subsidies can be subject to corruption (Fang et al., 2019), firms that receive subsidies are likely to behave well in order to shield the politicians who awarded those subsidies from negative scrutiny.

¹⁶ Since 2012, China has undertaken a far-reaching anti-corruption campaign. As of 2018, the number of officials formally investigated for corruption under the campaign had reached more than 2 million (Hao et al., 2020). Because subsidy announcements are only available from July 2014 onwards, our sample is concentrated in the post-campaign period.

In addition to these concerns, insiders may have a strong incentive to trade less thanks to the crackdown on insider trading. Regulators have, in recent years, invested heavily in the development of market-surveillance technology designed to spot market abuse, insider dealing, and market manipulation. Kacperczyk and Pagnotta (2020) show that, when facing higher legal risk, insiders trade less aggressively and concentrate on tips of greater value. As discussed in Section 2.2, the strengthened enforcement in China during our sample period has imposed higher litigation costs on insider trading. Thus, the association between government subsidies and insider trading has become a more open empirical question.

4. Data, Sample, and Research Design

4.1. Sample and data sources

We begin with all listed firms on the Shanghai and Shenzhen Stock Exchanges in the Chinese stock market during the period 2015-2017.¹⁷ Subsidy announcements, as well as the value of the subsidies awarded, are initially collected from the WIND database and then manually verified from multiple online resources.

The insider transactions for all open-market purchases and sales are downloaded from the China Securities Markets and Accounting Research (CSMAR) database. The dataset details the relevant company names, transaction types, transaction volumes and prices, and transaction dates. The media information is obtained from the China Research Data Services Platform (CNRDS). The information on financial analysts and all other financial and accounting information is obtained from the CSMAR database.

4.2. Model specification

¹⁷ The dataset of subsidy announcements starts from July 4, 2014. To exclude potential unexpected clustering effects of announcements in 2014, our sample period covers 2015 to 2017. However, the main empirical results are robust to the incorporation of announcements made in 2014.

In the main analysis, we examine whether there is abnormal insider trading in the months in which subsidies are received. To investigate the impact of firms' receipts of subsidies on their insider-trading intensity, we conduct a regression approach analogous to an event study of insider trading around subsidy announcements at a monthly level (MacKinlay, 1997). Specifically, we employ the following regression model:

$$Ratio_Net_{i,t} = \alpha + \beta_1 Subsidy_{i,t} + \mathbf{X}_{i,t-1}^T \boldsymbol{\beta} + \varepsilon_{i,t} \quad (1)$$

where i indicates the firm i and t indicates the year-month. The dependent variable is $Ratio_Net_{i,t}$, measured as the aggregated number of shares purchased by insiders, minus the aggregated number of shares sold, divided by the total number of shares outstanding in a given firm-year-month. $Ratio_Net_{i,t}$ is primarily defined to capture the net purchase volume of insider trades. The main explanatory variable is $Subsidy_{i,t}$, a dummy variable that takes a value of 1 if a firm receives any subsidies in a given year-month, and 0 otherwise. A positive and significant coefficient on $Subsidy_{i,t}$ is indicative of abnormal net insider purchases surrounding subsidy announcements.

The literature also suggests that certain corporate characteristics may affect the incentives for insider trading. For instance, insiders trade more actively in large stocks, in firms with low book-to-market ratios, and following positive past returns (e.g., Rozeff and Zaman, 1998; Lakonishok and Lee, 2001; Ke et al., 2003; Cohen et al., 2012; Sun and Yin, 2017). We control for these effects by employing a set of control variables: $Mretwd$, the monthly return with cash dividend reinvested; $Logmv$, the natural logarithm of the market capitalization of the firm; Btm , the book value of equity divided by market capitalization; $Turnover$, the sum of monthly trading volumes divided by shares outstanding; $Logsales$, the natural logarithm of total sales; $Closeprice$, the share price at the end of the month; $Lagcum6mret$, the cumulative stock return for the preceding six months; $Leverage$, the book value of debt divided by the book value of

equity. In addition, we control for the subsidy value, *Subsidyper*, calculated as the ratio of the subsidy amount to total sales.

We further include firm and year-month fixed effects and cluster the standard errors at the firm level. To ensure that our results are not driven by outliers, all continuous variables are winsorized at the 1st and 99th percentiles. All control variables are lagged by one month to mitigate potential concerns over reverse causality.¹⁸ All variables are defined in Appendix B.

4.3. Descriptive statistics

Panel A of Table 1 presents the distribution of the subsidy announcements across the sample years. We identify 3,489 subsidy announcements, referring to receipt days that originally span from 2015 to 2017. To rule out the potentially confounding effects on insider trading of material corporate announcements concerning events other than subsidies, we refine the full sample by excluding subsidies received within 10 days of earnings or dividend announcements, and are left with 3,032 announcements for 1,203 different firms. The yearly sample distributions before and after the removal of the confounding events are qualitatively similar, and there is a higher proportion of announcements in the year 2017 (44.34% and 44.53%) than in either 2015 (25.25% and 25.23%) or 2016 (30.41% and 30.24%).

[Insert Table 1 about here]

Panel B of Table 1 summarizes the volume of insider transactions on a monthly basis, in terms of purchases, sales, and net purchases.¹⁹ We utilize the monthly frequency because, according to the summary statistics in Figure 1, it is difficult to capture an overall picture of insider trading in relation to subsidies on a daily basis. Figure 1 presents the frequency

¹⁸ We also conduct robustness checks with the control variables in the current month. The results remain qualitatively unchanged.

¹⁹ In untabulated results, we find that insider transactions are not concentrated in any given month, which is inconsistent with a calendar-time-based explanation of both subsidies and insider trading clustering in the same month. In addition, the sample is not dominated by any particular industry.

distribution of the interval in days between Day 0 and the closest date to Day 0 on which an insider places a trade, where Day 0 is the subsidy-receipt date. A shorter interval indicates that the incidence of insider trading is higher around the dates of subsidy receipt.

The month-level insider-trading volume is obtained by aggregating the volume of all insider transactions within the same calendar month. The value of 0.04% for *Ratio_Purchase* implies that, on average, the aggregate number of shares purchased by insiders over the month represents 0.04% of the total number of shares outstanding for a given firm. Similarly, the value of 0.06% for *Ratio_Sale* suggests that, on average, the aggregate number of shares sold by insiders over the month amounts to 0.06% of the total number of shares outstanding for a given firm. The higher intensity of insider sales is consistent with sales generally being more common than purchases, because insiders commonly buy on good news but sell for a variety of reasons, for example, liquidity or diversification, in addition to anticipating stock price drops (e.g., Lakonishok and Lee, 2001; Fidrmuc et al., 2006).²⁰ On average, *Ratio_Net_Purchase* indicates that the monthly volume of net purchases (purchases minus sales) represents a net sale of 0.02% of shares outstanding, with a higher standard deviation (0.71) than either *Ratio_Purchase* (0.39) or *Ratio_Sale* (0.60).

Panel C presents the descriptive statistics of firm characteristics. The subsidy amount is, on average, 39.8 million RMB (approximately \$6.04 million). The mean of *Subsidyper* is 0.04, suggesting that the average subsidy value amounts to 4% of the annual total sales of a firm. We notice that the subsidy value as a percentage of sales is volatile, ranging from 0 to 36% in the main sample. The mean of *No. of title news* is 15 and the mean of *No. of content news* is 38. This indicates that there are, on average, 15 financial news items in which the focal firm is mentioned in the title (and 38 where it is mentioned in the content) in each month of the sample

²⁰ Insiders are frequently compensated with firms' stocks and options, but such acquisitions are not open-market purchases. However, when these options are exercised and the shares divested, the sales do result in open-market transactions and are included in the data. Consequently, the data contain many more sales than purchases.

period. In addition, there are, on average, 6.96 analysts following a firm, and 14.18 analyst reports for each sample firm. Finally, 51% of our sample firms exhibit political connections.

5. Empirical Results

5.1. Cumulative abnormal returns (CARs) around the subsidy-receipt dates

To test whether government subsidies are value relevant, we conduct an event study, following the methodology of MacKinlay (1997). Day 0 is the event day, when a firm receives a subsidy. We consider several event windows, including the [-10, 0], [-3, +3], [-5, +5], and [-10, +10] trading days around the subsidy-receipt date. Abnormal returns are computed as daily stock returns with cash dividend reinvested, minus the daily value-weighted average returns with cash dividend reinvested, for the A-share market (i.e., the Shanghai and Shenzhen Stock Exchanges). We calculate the CARs based on the daily abnormal returns across the various event windows.

Table 2 presents the CARs surrounding the subsidy-receipt dates. We find that, regardless of the length of the event window, the CARs are significantly positive around the subsidy-receipt dates. This suggests that government subsidies are value relevant.

[Insert Table 2 about here]

5.2. Baseline regression results

We report the baseline regression results in Table 3. In Column (1), where only *Subsidy* is included, the coefficient on *Subsidy* is 0.0004 (t -stat = 3.306). In Column (2), where firm and year-month fixed effects are included, the coefficient on *Subsidy* is 0.0005 (t -stat = 3.804). In Column (3), where all control variables and fixed effects are included, the coefficient on *Subsidy* is 0.0005 (t -stat = 2.27). The effects are not only statistically significant, but also economically meaningful. Our results suggest that, in the subsidy-receipt months, the net

insider-purchase ratio increases by 0.04-0.05% as a proportion of shares outstanding, relative to that in other months. These findings lend support to hypothesis *H1*, that insiders conduct more purchase activities due to the receipt of subsidies. Although we have controlled for the year-month fixed effects in the baseline model, one might still be concerned about the extent to which our results are driven by a calendar effect because the granting of subsidies could be clustered at the end of a calendar year. In our sample, 31.76% of the subsidies are awarded in December, while the remainder are distributed relatively evenly across other months. For robustness, we re-run the baseline regression after excluding December observations and the results are qualitatively unchanged.

[Insert Table 3 about here]

5.3. Coarsened exact matching (CEM) method

The firm characteristics of subsidized firms may differ systematically from those of unsubsidized firms. As a result, the potential confounding effects may hinder our ability to draw causal inferences regarding the impact of government subsidies on insider trading. To address this concern, we use an automated k-to-k CEM function to generate a test sample (Blackwell et al., 2009). We match the treatment firms with the control firms based on the covariates used in the baseline regression, and re-run our baseline regression model using the CEM sample (He et al., 2019). The coarsening bounds used for the covariates are chosen *ex ante* in an automatic manner.

Panel A of Table 4 presents the L1 statistics of the CEM covariates. L1 statistics are used to check the quality of the matching. If they are significantly reduced post matching, the quality is assured. As reported, the post-matched L1 statistics are significantly lower than the pre-matched ones for the majority of the covariates. Panel B reports the covariates' mean differences before and after CEM. Following CEM, all significant differences in the control

variables have diminished, indicating a successful matching. Panel C presents the main regression results based on the matched sample. Our main findings continue to hold.²¹

[Insert Table 4 about here]

5.4. Impact of the information environment on the subsidy-trading relation

To test hypothesis *H2*, that the relation between government subsidies and insider trading is constrained by information transparency, we use two measures of information transparency: media coverage and analyst following.

First, we test the role of the media in the subsidy-trading relation. We utilize two measures for news coverage. The first is *No. of title news*, defined as the number of news articles in which the focal firm is mentioned in the title in a given firm-year-month. The second measure is *No. of content news*, defined as the number of news articles in which the focal firm is mentioned in the content in a given firm-year-month. We then define two dummy variables based on these two continuous variables. Specifically, *High_title news* takes a value of 1 if *No. of title news* is larger than its industry median in a given firm-year-month, and 0 otherwise. Likewise, *High_content news* takes a value of 1 if *No. of content news* is larger than its industry median in a given firm-year-month, and 0 otherwise.

Columns (1) and (2) in Panel A of Table 5 report the results based on *High_title news*. The positive relation between subsidies and insider trading is muted among the high-coverage firms but remains significant for the low-coverage group. The difference in the coefficient on *Subsidy* between these two groups is also statistically significant. In Columns (3) and (4), we

²¹ We thank an anonymous reviewer for this suggestion. As a further robustness check, we repeat our main regression using a propensity-score-matched sample. As can be seen in Appendix C, our main results remain unchanged.

use the alternative measure of news coverage (*High_content news*) and obtain similar outcomes.²²

[Insert Table 5 about here]

Besides media coverage, as one of the most important groups of financial intermediaries, analysts play a vital role in reducing information asymmetry by providing public information to market participants (e.g., Healy and Palepu, 2001; Frankel and Li, 2004). Following this line of argument, we use the number of analysts following a firm and the number of associated analyst reports to define analyst coverage levels. Then we define two partitioning dummy variables, based on the industry median of each of them in a given firm-year, to distinguish between firms with high and low coverage. The results are reported in Panel B of Table 5, and suggest that the positive relation between subsidies and insider trading is significantly stronger for firms with lower levels of analyst coverage.

5.5. Impact of subsidy predictability on the subsidy-trading relation

Hypothesis *H3* predicts that the relation between insider trading and government subsidies can be moderated when subsidies are granted on a more predictable basis. To test this prediction, we first estimate the predictability of subsidies. We follow Lee et al. (2014) in estimating the persistence equation for each firm by regressing the subsidies of month *t* on the subsidies and book value of the previous month. In Panel A of Table 6, the sample is divided into two groups according to whether the coefficient estimated from the persistence equation is above or below the sample median. The *Low predictability* group captures subsidies that are

²² A potential issue with this test is the possible correlation between the extent of media coverage and firm size. Theoretically, firm size can proxy for many factors, such as the political cost related to public and regulatory scrutiny. To confirm the incremental effect of media coverage, in unreported results we also control for the interaction between the subsidy dummy variable (*Subsidy*) and the measure of firm size (*Logmv*) and the moderating effect of media coverage continues to hold. We thank an anonymous referee for highlighting this.

granted on a less predictable basis (and the *High predictability* group those on a more predictable basis). The positive relation between subsidies and insider trading is muted for the *High predictability* group but remains significant for its low counterpart. A further test suggests a significant difference between the coefficients on *Subsidy* of the two groups.

[Insert Table 6 about here]

We also measure the predictability of subsidies on the basis of whether a firm is supported by a Five-Year Plan of the central government. China's Five-Year Plans are a series of social and economic development initiatives that have been issued since 1953. Each plan specifies a set of industries that will be the focus of government support over the following five-year period. Subsidies granted to firms in industries with government support, especially those in key industries, are substantially more stable and predictable than others (Li et al., 2021). Because our sample period is from 2015 to 2017, we manually identify such government-backed industries on the basis of the 13th Five-Year Plan, which started in 2015. We decompose our sample firms into three groups: unsupported firms, firms with regular support, and firms with key support. Subsidies received by firms with key support are the most predictable, followed by those received by firms with regular support, and lastly by those of unsupported firms.

Panel B of Table 6 presents the regression results. In Column (1), where the sample consists of unsupported firms, the positive relation between insider trading and government subsidies prevails. When it comes to Columns (2) and (3), where the samples consist of firms with regular support and key support, respectively, the impact of subsidy receipt on insider trading diminishes. These results are consistent with our prediction that the predictability of the received subsidies would attenuate their association with insider trades.

5.6. Impact of political connections on the subsidy-trading relation

Hypothesis *H4* predicts that insiders of politically connected firms are more likely to trade on government subsidies than those of unconnected firms. To test this hypothesis, we measure political connections in two alternative ways. We first follow Li et al. (2021) in measuring the political connectedness of the CEO and the Chairman of the board on the basis of their career histories and the geographical coincidence between the firm and the incumbent provincial political leaders. Specifically, *Political connection* is a dummy variable that takes a value of 1 if the CEO or Chairman is a current or former government official, or the firm is registered in the birthplace of the current provincial Governor or (Chinese Communist) Party Secretary, and 0 otherwise. In Panel A of Table 7, the sample is divided into two groups according to whether a firm has such political connections. The results show that the positive relation between subsidies and insider trading is significantly stronger for politically connected firms.

[Insert Table 7 about here]

In addition, it is well documented that there are differences in market power and political clout between SOEs and non-SOEs. The former are deemed to have innate political connections. We partition our sample firms into SOEs and non-SOEs, and further divide SOEs into local SOEs and central SOEs. Local SOEs are owned or controlled by local governments, while central SOEs are owned or controlled by central government. The results are reported in Panel B of Table 7. We find that the positive relation between insider trading and government subsidies prevails in SOEs, especially local SOEs, but not non-SOEs. It is worth noting that the relation between insider trading and subsidies is insignificant in central SOEs. This result can be explained by the fact that managers of China's central SOEs work in a very closed pyramidal managerial-labor market and have much stronger political promotion incentives

than those in local SOEs (Chen et al., 2018). Consequently, such managers will likely favor a low-risk strategy to increase their promotion prospects; existing literature has also reported that unethical behavior can lead to negative impacts on their careers and severe losses of reputation (Chen et al., 2018). As such, insiders of central SOEs are less likely to trade on subsidies for fear of risking their political careers. However, overall, the results reported in Table 7 confirm hypothesis *H4*, that insiders of politically connected firms are more likely to trade on subsidy information.²³

6. Further Analysis

So far, we have observed a robust relation between subsidies and insider trading. There are two possible but not mutually exclusive explanations for our results: (1) insiders may possess private information unavailable to outside investors regarding the subsidies awarded (e.g., the likelihood and timing of such subsidies); (2) insiders may have a superior ability to detect the mispricing of subsidy information when it becomes publicly known. In this section, we attempt to separately examine these two channels.

6.1. Informational advantage channel

Cohen et al. (2012) suggest that opportunistic insider transactions are more likely to be driven by private information, while routine transactions are more likely to be driven by considerations of diversification or liquidity. If the informational advantage channel holds, then we would expect opportunistic trades to increase by a larger extent around the subsidy-receipt

²³ While political connection is positively correlated with the SOE status, the correlation coefficient is modest (0.0398). This is because SOE is defined based on the ultimate ownership of the firm, whereas political connection is defined based on whether the CEO or the chairman has experience of working in the government or if the provincial secretary or governor is from the town in which the firm is registered. According to definition, CEOs or chairmen of SOEs may not necessarily have political connection. To test the incremental explanatory power of the *SOE* partitioning variable, we include *Political Connection* as an additional control variable. The results in Panel B Table 7 continue to hold. However, we are not able to include *SOE* in the regression with *Political Connection* as the partitioning variable, because *SOE* is time-invariant and therefore is absorbed by firm fixed effects.

month than routine trades.²⁴ Following Cohen et al. (2012) and many other studies (e.g., Alldredge and Cicero, 2015; Massa et al., 2015), we identify transactions made by an insider who has placed a trade in the same calendar month for at least three consecutive years as routine trades; we also identify those transactions where the time interval between two consecutive trades is fixed as routine.²⁵ We identify the remainder as opportunistic trades.²⁶

Table 8 presents the associated regression results. In Column (1), the dependent variable is *Ratio_Net_Oppportunistic*, measured as the number of shares purchased in opportunistic trades minus the number of shares sold, divided by the total number of shares outstanding in a given firm-month. In Column (2), the dependent variable is *Ratio_Net_Routine*, measured as the number of shares purchased in routine trades minus the number of shares sold, divided by the total number of shares outstanding in a given firm-month. Consistent with the informational advantage channel, we do not find a significant subsidy-trading relationship for routine trades (-0.0001, *t*-stat=-0.45), whereas for opportunistic trades, there is a positive and statistically significant subsidy-trading relationship (0.0005, *t*-stat=2.46).

[Insert Table 8 about here]

6.2. Mispricing channel

²⁴ According to the information hierarchy hypothesis proposed by Seyhun (1986), insiders who are more knowledgeable about the overall operational activities of a firm (such as CEOs and CFOs) are more successful predictors of future stock price movements. However, because they are more rigorously scrutinized, they may choose not to use their information advantage for trading (Jeng et al., 2003). Nevertheless, this classification should be applied with caution in China. Unlike in the US, the insider trading data in China do not disclose the insiders' positions. Given the insiders' names, we can roughly identify their positions by matching with another dataset which covers the personal information of top management and boards of directors. However, this inevitably results in the misclassification of insiders' titles. In light of this issue, we choose not to report this finding in our manuscript.

²⁵ Cohen et al. (2012) develop a new algorithm to decode the informational content of insider trading. For each insider, they analyze their past trading history and look for consistent patterns in the timing of trades. They define a routine trader as an insider who has placed a trade in the same calendar month for a minimum number of previous years, and opportunistic traders as insiders who have traded in the same years as the "routine" insiders but without an obviously discernible pattern to the timing of their past trades.

²⁶ Consistent with Cohen et al. (2012), we find the abnormal returns of opportunistic purchases over the [0, 3] and [0, 5] windows to be positive, while the abnormal returns of opportunistic sales over those windows are negative. We do not document any abnormal returns for routine purchases or sales.

Another possible explanation for the observed subsidy-trading relation is that subsidies may generate mispricing-related opportunities that can be better recognized by insiders. Previous research suggests that insiders do have superior abilities to detect mispricing associated with publicly known information (Veenman, 2013; Contreras et al., 2017). To test this alternative explanation, we examine the stock-return predictability of subsidies. Column (1) of Table 9 presents the Fama-MacBeth regression results, while Column (2) reports the ordinary least squares (OLS) results. The dependent variable is $Return_{t+1}$, measured as the one-month-ahead stock return. The results show that subsidies are positively associated with future stock returns, suggesting that subsidies are relatively underpriced and do, therefore, give rise to mispricing-related opportunities. This is consistent with the explanation that insiders can also achieve abnormal returns by exploiting mispricing opportunities in relation to government subsidies.

[Insert Table 9 about here]

7. Conclusion

This paper has examined the relation between government subsidies and insider trading for Chinese listed firms. We find that insider-trading intensity increases significantly during a month in which a firm receives government subsidies. However, the positive relation between subsidies and insider trading is substantially attenuated among firms with a more transparent information environment, and when subsidies are granted on a more predictable basis. By contrast, the positive relation between subsidies and insider trading is even more pronounced for firms with political connections.

We expect our results to be of interest to various groups of stakeholders, including investors, practitioners, and policymakers. Our study responds to the call of Cohen et al. (2012) for the identification and decoding of more price-sensitive events. In addition, our study

reconciles some of the mixed findings regarding the role of the media in corporate behaviors, providing avenues for further research on the real impact of news dissemination. In particular, future research could investigate how investors react to the exploitation of insiders' advantage through social media and other channels. Moreover, we expect our findings to inform the setting of financial reporting standards, which are supposed to consider how government subsidies should be disclosed and how corporate insiders can be prohibited from trading on inside knowledge of such subsidies.

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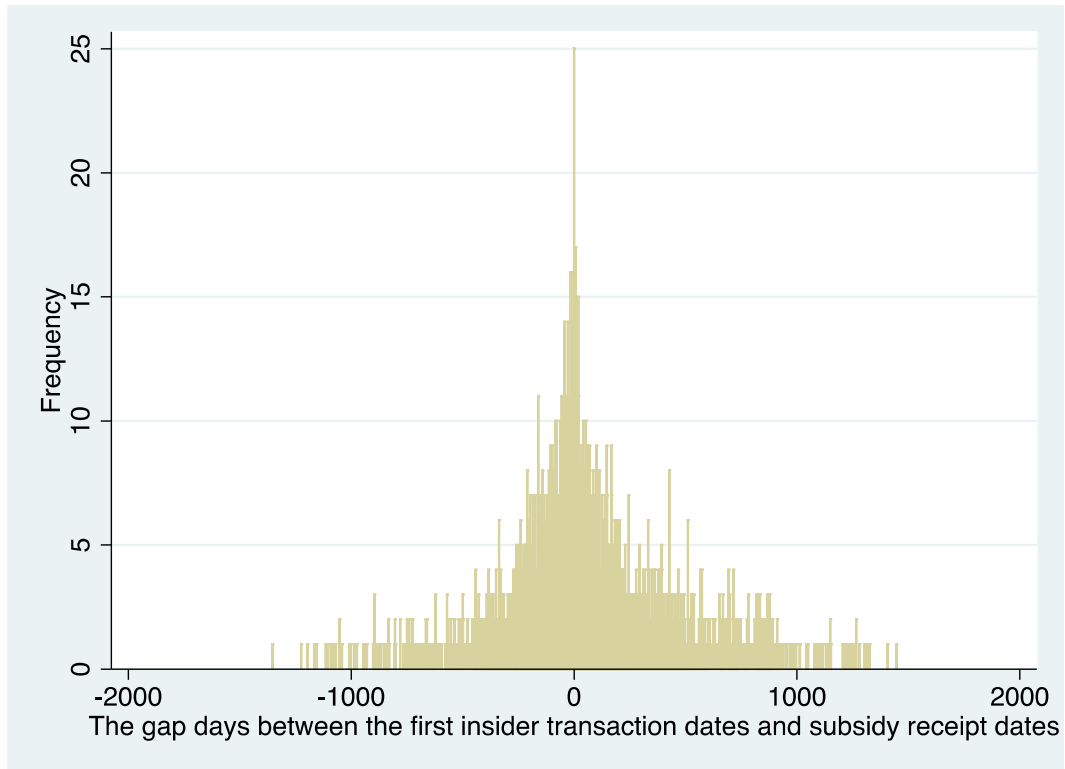


Figure 1 Frequency Distribution of Intervals between Day 0 and Closest Insider Trading Day

This figure presents the frequency distribution of the interval in days between Day 0 and the closest date to Day 0 on which an insider places a trade, where Day 0 is the subsidy-receipt date. A shorter interval indicates that the incidence of insider trading is higher around the date of subsidy receipt.

Table 1 Summary Statistics

This table presents the sample distribution and descriptive statistics for the variables used in the main regression. Panel A reports the distribution of subsidy announcements across sample years, before and after excluding confounding events. Earnings or dividend announcements that take place within 10 days of the subsidy announcement are identified as confounding events. Panel B reports the summary statistics for insider transactions at the monthly level. Panel C reports the summary statistics of firm characteristics. Definitions of variables are presented in Appendix B.

Panel A: Distribution of subsidy announcements across years, before and after excluding confounding events

Year	Before		After		No. of firms
	Frequency	Percent	Frequency	Percent	
2015	881	25.25%	765	25.23%	466
2016	1,061	30.41%	917	30.24%	524
2017	1,547	44.34%	1,350	44.53%	777
Total	3,489	100%	3,032	100%	1,203

Panel B: Summary statistics of insider transactions

	Mean	Median	1%	99%	Std. Dev
<i>Ratio_Purchase</i>	0.04%	0.00%	0.00%	1.01%	0.39
<i>Ratio_Sale</i>	0.06%	0.00%	0.00%	2.12%	0.60
<i>Ratio_Net Purchase</i>	-0.02%	0.00%	-2.08%	1.00%	0.71
<i>Ratio_Net_Opportunistic</i>	-0.14%	0.00%	-4.98%	1.57%	1.10
<i>Ratio_Net_Routine</i>	-0.01%	0.00%	0.00%	0.32%	0.18

Panel C: Summary statistics of firm characteristics

	Mean	Median	1%	99%	Std. Dev
<i>Subsidy Amount (RMB, in million)</i>	39.80	10.40	0.18	700.00	96.50
<i>Subsidyper</i>	0.04	0.01	0.00	0.36	0.68
<i>Mretwd</i>	0.02	0.00	-0.37	0.56	0.19
<i>Logmv</i>	22.85	22.74	19.42	25.80	1.02
<i>Btm</i>	0.90	0.29	0.02	15.09	6.97
<i>Turnover</i>	0.61	0.38	0.01	3.80	0.72
<i>Logsales</i>	21.53	21.38	17.75	25.95	1.57
<i>Closeprice</i>	19.87	14.52	1.12	90.57	19.14
<i>Lagcum6mret</i>	0.11	0.06	-0.49	1.27	0.36
<i>Leverage</i>	1.55	0.74	0.05	13.72	16.23
<i>No. of title news</i>	15.00	7.00	0.00	109.00	27.94
<i>No. of content news</i>	38.00	17.00	1.00	360.00	119.00
<i>No. of analysts following</i>	6.96	4.00	0.00	36.00	8.28
<i>No. of analyst reports</i>	14.18	6.00	0.00	93.00	20.13
<i>Political connection</i>	0.51	1.00	0.00	1.00	0.50

Table 2 Cumulative Abnormal Returns around Subsidy Receipt Dates

This table reports cumulative abnormal returns (CARs) in the [-10, 0], [-3, +3], [-5, +5], and [-10, +10] event windows around subsidy receipt dates. Abnormal returns are computed as daily stock returns with cash dividend reinvested, minus the daily value-weighted average returns with cash dividend reinvested, for the A-share market. The *t*-statistics reveal whether CARs are significantly different from zero (two-sided). *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Event window	CAR	<i>t</i> -statistics
[-10, 0]	0.0039**	2.06
[-3, +3]	0.0013**	2.34
[-5, +5]	0.0023***	3.06
[-10, +10]	0.0032***	3.25

Table 3 Baseline Regression Results

This table presents the baseline regression results for the impact of firms' receipt of subsidies on insider trading intensity. The dependent variable is *Ratio_Net*, measured as the number of shares purchased by insiders minus the number of shares sold, divided by the total number of shares outstanding in a given firm-year-month. The independent variable is *Subsidy*, a dummy variable that equals 1 if the firm receives any subsidies in a given firm-year-month, and 0 otherwise. Robust *t*-statistics are reported in parentheses. All continuous variables are winsorized at the 1st and 99th percentiles. Definitions of variables are presented in Appendix B. All control variables are lagged by one month. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable= <i>Ratio_Net</i>		
	(1)	(2)	(3)
<i>Subsidy</i>	0.0004*** (3.3056)	0.0005*** (3.8040)	0.0005** (2.2698)
<i>Subsidyper</i>			-0.0003 (-0.6444)
<i>Mretwd</i>			-0.0000 (-0.0565)
<i>Logmv</i>			-0.0009*** (-4.5684)
<i>Btm</i>			-0.0000 (-0.3840)
<i>Turnover</i>			-0.0000 (-0.1608)
<i>Logsales</i>			-0.0002 (-1.4123)
<i>Closeprice</i>			0.0000 (0.6610)
<i>Lagcum6mret</i>			-0.0001 (-0.8932)
<i>Leverage</i>			-0.0000 (-0.5817)
<i>Constant</i>	-0.0002*** (-7.9034)	-0.0012*** (-5.9228)	0.0246*** (5.2367)
Firm fixed effects	No	Yes	Yes
Year-month effects	No	Yes	Yes
N	85,409	85,409	54,162
Adj.R ²	0.000	0.004	0.018

Table 4 Coarsened Exact Matching Method

This table reports the regression results using a sample created using coarsened exact matching (CEM). Panel A presents the L1 statistics of the covariates used in the regression that is performed for the CEM. Panel B reports the covariates' mean differences before and after the matching. Panel C presents the regression results based on the CEM sample. The dependent variable is *Ratio_Net*, measured as the number of shares purchased by insiders minus the number of shares sold, divided by the total number of shares outstanding in a given firm-year-month. The independent variable is *Subsidy*, a dummy variable that equals 1 if the firm receives any subsidies in a given firm-year-month, and 0 otherwise. Robust *t*-statistics are reported in parentheses. All continuous variables are winsorized at the 1st and 99th percentiles. Definitions of variables are presented in Appendix B. All control variables are lagged by one month. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Diagnostic check of the quality of coarsened exact matching

	Pre-matched L1 statistics	Post-matched L1 statistics
<i>Mretwd</i>	0.0821	0.0650
<i>Logmv</i>	0.0746	0.0678
<i>Btm</i>	0.0657	0.0610
<i>Turnover</i>	0.0760	0.0525
<i>Logsales</i>	0.1051	0.1036
<i>Closeprice</i>	0.0693	0.0487
<i>Lagcum6mret</i>	0.0778	0.1000
<i>Leverage</i>	0.0832	0.0211

Panel B: Covariate mean differences

	Full sample			CEM-matched sample		
	Subsidy N=1,237	Non-subsidy N=17,716	Diff. in means	Subsidy N=291	Non-subsidy N=450	Diff. in means
<i>Mretwd</i>	0.0216	0.0207	0.0009	-0.0071	-0.0030	-0.0041
<i>Logmv</i>	22.8860	22.9110	-0.0250	22.8136	22.7917	0.0218
<i>Btm</i>	0.3948	0.4169	-0.0221	0.4361	0.4497	-0.0136
<i>Turnover</i>	0.5980	0.5720	0.0260*	0.3159	0.2884	0.0275
<i>Logsales</i>	21.7700	21.6070	0.1630***	21.7554	21.7711	-0.0157
<i>Closeprice</i>	15.7900	16.4670	-0.6770**	12.0279	11.4899	0.5379
<i>Lagcum6mret</i>	0.1148	0.1511	-0.0363***	0.0298	0.0317	-0.0019
<i>Leverage</i>	1.5181	1.7068	-0.1887***	1.1040	1.0299	0.0741

Panel C: Main regression with the CEM sample

	Dependent variable= <i>Ratio_Net</i>
<i>Subsidy</i>	0.0009** (2.3421)
Controls	Yes
Firm fixed effects	Yes
Year-month effects	Yes
N	741
Adj.R ²	0.032

Table 5 Impact of Information Transparency on Subsidy-Trading Association

This table presents the regression results for the moderating effect of information transparency on the subsidy-trading relationship. In Panel A, the full sample is divided into firm-year-months with high/low media coverage, measured by the number of news items mentioning the firm in the title or content, respectively. *High_title news* is a dummy variable that equals 1 when *No. of title news* is larger than its industry median in a given firm-year-month, and 0 otherwise. *High_content news* is a dummy variable that equals 1 when *No. of content news* is larger than its industry median in a given firm-year-month, and 0 otherwise. In Panel B, the full sample is divided into firm-year-months with high/low analyst coverage measured by the number of analysts following and the number of analyst reports, respectively. *High_analysts* is a dummy variable that equals 1 when *No. of analysts following* is larger than its industry median in a given firm-year, and 0 otherwise. *High_reports* is a dummy variable that equals 1 when *No. of analyst reports* is larger than its industry median in a given firm-year, and 0 otherwise. The dependent variable is *Ratio_Net*, measured as the number of shares purchased by insiders minus the number of shares sold, divided by the total number of shares outstanding in a given firm-year-month. The independent variable is *Subsidy*, a dummy variable that equals 1 if the firm receives any subsidies in a given firm-year-month, and 0 otherwise. We report the *p-value* of the F test (two-sided) for the difference in the coefficient on *Subsidy* between the two groups. Robust *t*-statistics are reported in parentheses. All continuous variables are winsorized at the 1st and 99th percentiles. Definitions of variables are presented in Appendix B. All control variables are lagged by one month. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Media coverage

	Dependent variable= <i>Ratio_Net</i>			
	(1)	(2)	(3)	(4)
	High_ title news=1	High_ title news=0	High_ content news=1	High_ content news=0
<i>Subsidy</i>	0.0003 (0.8159)	0.0013*** (2.6004)	0.0003 (1.0230)	0.0012** (2.2748)
<i>Subsidyper</i>	-0.0009 (-0.8532)	-0.0002 (-0.2316)	0.0004 (0.8018)	-0.0013 (-1.0520)
<i>Mretwd</i>	0.0006 (0.6585)	-0.0010 (-1.0494)	0.0005 (0.5825)	-0.0013 (-1.2382)
<i>Logmv</i>	-0.0013*** (-2.7151)	-0.0007 (-1.4721)	-0.0014*** (-2.6396)	-0.0011** (-2.2472)
<i>Btm</i>	-0.0002 (-0.6165)	0.0004 (0.9888)	-0.0002 (-0.5232)	0.0000 (0.1181)
<i>Turnover</i>	-0.0001 (-0.3601)	0.0003 (1.0535)	-0.0001 (-0.6278)	0.0003 (1.3539)
<i>Logsales</i>	0.0003 (0.7696)	-0.0003 (-0.6779)	0.0001 (0.1994)	-0.0002 (-0.4715)
<i>Closeprice</i>	-0.0000 (-0.6684)	0.0000 (1.5523)	0.0000 (0.1690)	0.0000 (0.7960)
<i>Lagcum6mret</i>	0.0001 (0.2267)	-0.0000 (-0.0007)	-0.0001 (-0.4565)	0.0000 (0.0979)
<i>Leverage</i>	-0.0003 (-1.1860)	-0.0000 (-0.1511)	-0.0001 (-0.3957)	-0.0001 (-0.8761)
<i>Constant</i>	0.0239** (2.0943)	0.0217** (2.0806)	0.0287** (2.3062)	0.0272** (2.5671)
Firm fixed effects	Yes	Yes	Yes	Yes
Year-month effects	Yes	Yes	Yes	Yes
N	17,156	14,070	16,907	14,319
Adj.R ²	0.013	0.023	0.018	0.014
F test (<i>p-value</i>)		0.0374**		0.0758*

Panel B: Analyst coverage

	Dependent variable= <i>Ratio_Net</i>			
	(1) High_ analysts=1	(2) High_ analysts=0	(3) High_ reports=1	(4) High_ reports=0
<i>Subsidy</i>	-0.0001 (-0.2898)	0.0008*** (2.8244)	0.0000 (0.0238)	0.0008*** (2.7746)
<i>Subsidyper</i>	0.0010 (0.6052)	-0.0006 (-1.0381)	0.0001 (0.1034)	-0.0005 (-0.8600)
<i>Mretwd</i>	0.0000 (0.0427)	0.0003 (0.4481)	-0.0003 (-0.4634)	0.0006 (0.9498)
<i>Logmv</i>	-0.0015*** (-3.5721)	-0.0006** (-2.1484)	-0.0016*** (-3.7628)	-0.0006** (-1.9616)
<i>Btm</i>	-0.0002 (-0.6041)	-0.0002 (-1.1223)	-0.0001 (-0.1586)	-0.0002 (-0.9418)
<i>Turnover</i>	0.0001 (0.3898)	-0.0000 (-0.3032)	0.0002 (1.1680)	-0.0001 (-0.8657)
<i>Logsales</i>	0.0003 (0.6955)	-0.0003 (-1.2116)	0.0003 (0.7579)	-0.0003 (-1.4558)
<i>Closeprice</i>	-0.0000 (-0.3906)	0.0000 (0.2201)	0.0000 (0.2583)	-0.0000 (-0.2856)
<i>Lagcum6mret</i>	-0.0002 (-0.8393)	-0.0002 (-0.8525)	-0.0003 (-1.1672)	-0.0002 (-0.6603)
<i>Leverage</i>	-0.0003 (-1.2501)	-0.0001 (-0.5766)	-0.0003 (-1.1471)	-0.0001 (-0.5811)
<i>Constant</i>	0.0290*** (2.8461)	0.0193*** (2.8517)	0.0302*** (3.1404)	0.0199*** (2.7954)
Firm fixed effects	Yes	Yes	Yes	Yes
Year-month effects	Yes	Yes	Yes	Yes
N	25,615	27,822	26,075	27,362
Adj.R ²	0.013	0.026	0.013	0.027
F test (<i>p-value</i>)		0.0469**		0.0552*

Table 6 Impact of Subsidy Predictability on Subsidy-Trading Association

This table presents the regression results for the impact of subsidy predictability on the subsidy-trading relationship. In Panel A, the sample is divided into two groups based on whether the coefficient estimated from the persistence equation is larger or smaller than the sample median. We follow Lee et al. (2014) to estimate the persistence equation, which is the regression of the subsidies in month t on the subsidies and book value of the previous month. The *Low (High) predictability* group captures subsidies that are less (more) likely to be predicted based on past subsidy information. In Panel B, the sample firms are divided into three groups based on the extent to which the firm is supported by the national five-year guidelines. Column (1) shows the results for firms that are not supported by the five-year guidelines. Column (2) includes firms with regular support based on the five-year guidelines. Column (3) covers firms with key support according to the five-year guidelines. The dependent variable is *Ratio_Net*, measured as the number of shares purchased by insiders minus the number of shares sold, divided by the total number of shares outstanding in a given firm-year-month. The independent variable is *Subsidy*, a dummy variable that equals 1 if the firm receives any subsidies in a given firm-year-month, and 0 otherwise. We report the *p-value* of an F test (two-sided) for the difference in the coefficient on *Subsidy* between the two groups. Robust *t*-statistics are reported in parentheses. All continuous variables are winsorized at the 1st and 99th percentiles. Definitions of variables are presented in Appendix B. All control variables are lagged by one month. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Predictability of subsidies

	Dependent variable= <i>Ratio_Net</i>	
	(1)	(2)
	<i>Low predictability</i>	<i>High predictability</i>
<i>Subsidy</i>	0.0004** (2.2021)	0.0002 (0.4019)
<i>Subsidyper</i>	-0.0006 (-0.9680)	0.0040** (2.3579)
<i>Mretwd</i>	-0.0002 (-0.2359)	-0.0006 (-0.9395)
<i>Logmv</i>	-0.0010*** (-3.8336)	-0.0000 (-0.0011)
<i>Btm</i>	-0.0001 (-0.3253)	0.0000 (0.6184)
<i>Turnover</i>	0.0003* (1.9390)	-0.0002 (-1.2397)
<i>Logsales</i>	-0.0003 (-1.4031)	0.0002 (0.4789)
<i>Closeprice</i>	0.0000 (1.5624)	-0.0000 (-1.5575)
<i>Lagcum6mret</i>	-0.0000 (-0.1223)	-0.0006* (-1.9337)
<i>Leverage</i>	-0.0000 (-0.5610)	0.0000*** (2.6250)
<i>Constant</i>	0.0279*** (4.5681)	-0.0029 (-0.2641)
Firm fixed effects	Yes	Yes
Year-month effects	Yes	Yes
N	13,994	13,953
Adj.R ²	0.026	0.005
F test (<i>p-value</i>)		0.0340**

Panel B: Five-year plan

	Dependent variable= <i>Ratio_Net</i>		
	(1)	(2)	(3)
	Unsupported firms	Firms with regular support	Firms with key support
<i>Subsidy</i>	0.0005** (2.4475)	0.0004 (0.5344)	-0.0000 (-0.0091)
<i>Subsidyper</i>	-0.0000 (-0.1143)	0.0053 (0.2612)	-0.0094 (-0.7865)
<i>Mretwd</i>	-0.0001 (-0.1739)	0.0014 (0.5382)	-0.0002 (-0.1617)
<i>Logmv</i>	-0.0008*** (-4.1980)	-0.0003 (-0.3219)	-0.0005 (-0.5997)
<i>Btm</i>	-0.0000 (-0.1381)	-0.0016 (-0.4777)	-0.0006 (-0.4454)
<i>Turnover</i>	0.0000 (0.0264)	-0.0001 (-0.2900)	0.0000 (0.0324)
<i>Logsales</i>	-0.0003 (-1.4641)	-0.0018 (-1.3238)	0.0002 (0.4034)
<i>Closeprice</i>	0.0000 (0.3160)	-0.0000 (-0.8364)	0.0000 (1.6213)
<i>Lagcum6mret</i>	-0.0002 (-1.1375)	0.0003 (0.6901)	0.0003 (1.2061)
<i>Leverage</i>	-0.0000 (-0.4724)	0.0001 (0.1849)	-0.0006*** (-12.4051)
<i>Constant</i>	0.0242*** (4.9224)	0.0443* (1.7612)	0.0039 (0.2131)
Firm fixed effects	Yes	Yes	Yes
Year-month effects	Yes	Yes	Yes
N	49,993	1,654	2,086
Adj.R ²	0.018	0.062	0.043

Table 7 Impact of Political Connections on Subsidy-Trading Association

This table presents the regression results for the impact of political connections on the subsidy-trading relationship. In Panel A, the sample is divided into two groups based on whether a firm has political connections. *Political Connection* is a dummy variable that equals 1 if the CEO or chairman has experience of working in the government or if the provincial secretary or governor is from the town in which the firm is registered, and 0 otherwise. In Panel B, the sample firms are divided into four groups based on the type of their ultimate controller. Column (1) shows the results for state-owned firms (SOEs). Column (2) shows the results for firms that are controlled by the local government. Column (3) includes firms that are controlled by the central government. Column (4) shows the results for non-state-owned firms. The dependent variable is *Ratio_Net*, measured as the number of shares purchased by insiders minus the number of shares sold, divided by the total number of shares outstanding in a given firm-year-month. The independent variable is *Subsidy*, a dummy variable that equals 1 if the firm receives any subsidies in a given firm-year-month, and 0 otherwise. We report the *p-value* of an F test (two-sided) for the difference in the coefficient on *Subsidy* between the two groups. Robust *t*-statistics are reported in parentheses. All continuous variables are winsorized at the 1st and 99th percentiles. Definitions of variables are presented in Appendix B. All control variables are lagged by one month. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: The role of work experience-based or hometown-based political connections

	Dependent variable= <i>Ratio_Net</i>	
	(1)	(2)
	<i>Political Connection</i> =1	<i>Political Connection</i> =0
<i>Subsidy</i>	0.0008** (1.9818)	0.0003 (0.3756)
<i>Subsidyper</i>	-0.0021** (-2.4220)	-0.0050 (-0.4501)
<i>Mretwd</i>	-0.0009 (-0.6310)	0.0001 (0.1204)
<i>Logmv</i>	-0.0024*** (-3.6908)	-0.0011* (-1.9248)
<i>Btm</i>	-0.0005* (-1.6510)	-0.0006 (-1.0885)
<i>Turnover</i>	0.0003 (1.0415)	-0.0001 (-0.4367)
<i>Logsales</i>	0.0003 (0.4778)	0.0001 (0.3833)
<i>Closeprice</i>	0.0000 (1.4889)	0.0000 (1.3958)
<i>Lagcum6mret</i>	-0.0015*** (-2.7865)	-0.0001 (-0.1431)
<i>Leverage</i>	-0.0005 (-0.8883)	-0.0004 (-0.8721)
<i>Constant</i>	0.0496*** (2.8896)	0.0202* (1.8338)
Firm fixed effects	Yes	Yes
Year-month effects	Yes	Yes
N	9,216	10,855
Adj.R ²	0.032	0.021
F test (<i>p-value</i>)		0.0235**

Panel B: The role of ownership-based political connections

	Dependent variable= <i>Ratio_Net</i>			
	(1)	(2)	(3)	(4)
	SOEs	Local SOEs	Central SOEs	Non-SOEs
<i>Subsidy</i>	0.0008** (1.9978)	0.0010** (1.9922)	0.0004 (0.9017)	0.0004 (1.2419)
<i>Subsidyper</i>	0.0000 (0.0486)	-0.0002 (-0.4952)	0.0062 (1.1270)	-0.0015 (-0.9193)
<i>Mretwd</i>	-0.0001 (-0.0989)	0.0003 (0.2165)	0.0001 (0.1962)	-0.0001 (-0.1976)
<i>Logmv</i>	-0.0012*** (-3.4110)	-0.0011 (-1.6480)	-0.0001 (-0.3283)	-0.0013*** (-3.9880)
<i>Btm</i>	-0.0001 (-0.5085)	0.0005 (0.5326)	-0.0001 (-0.8609)	-0.0003 (-0.8826)
<i>Turnover</i>	0.0004* (1.7815)	0.0007** (2.1929)	-0.0003 (-1.3472)	-0.0001 (-0.6848)
<i>Logsales</i>	-0.0004 (-1.0668)	-0.0005 (-1.2920)	0.0000 (0.0217)	-0.0001 (-0.5935)
<i>Closeprice</i>	0.0000 (0.0820)	-0.0000 (-0.6565)	-0.0000 (-0.3641)	0.0000 (1.5757)
<i>Lagcum6mret</i>	0.0000 (0.0081)	0.0004 (1.2115)	-0.0002 (-0.9487)	-0.0005** (-1.9761)
<i>Leverage</i>	-0.0001 (-0.9419)	0.0001 (1.0473)	0.0000 (0.6551)	-0.0002 (-1.1056)
<i>Constant</i>	0.0371*** (3.4591)	0.0353** (2.4114)	0.0029 (0.3235)	0.0315*** (4.3945)
Firm fixed effects	Yes	Yes	Yes	Yes
Year-month effects	Yes	Yes	Yes	Yes
N	18,881	6,056	9,237	27,029
Adj.R ²	0.017	0.014	0.020	0.023

Table 8 Opportunistic versus Routine Insider Trading

This table presents the regression results for the impact of firms' receipt of subsidies on opportunistic and routine insider trading intensity, respectively. Following Cohen et al. (2012), we identify transactions made by an insider who places a trade in the same calendar month for at least two consecutive years, and those where the trading time interval between two consecutive trades is fixed, as routine trades, and the rest as opportunistic trades. In Column (1), the dependent variable is *Ratio_Net_Oppportunistic*, measured as the number of shares purchased by opportunistic trades minus the number of shares sold, divided by the total number of shares outstanding in a given firm-year-month. In Column (2), the dependent variable is *Ratio_Net_Routine*, measured as the number of shares purchased by routine trades minus the number of shares sold, divided by the total number of shares outstanding in a given firm-year-month. The independent variable is *Subsidy*, a dummy variable that equals 1 if the firm receives any subsidies in a given firm-year-month, and 0 otherwise. Robust *t*-statistics are reported in parentheses. All continuous variables are winsorized at the 1st and 99th percentiles. Definitions of variables are presented in Appendix B. All control variables are lagged by one month. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable= <i>Ratio_Net_Oppportunistic</i> (1)	Dependent variable= <i>Ratio_Net_Routine</i> (2)
<i>Subsidy</i>	0.0005** (2.4555)	-0.0001 (-0.4527)
<i>Subsidyper</i>	-0.0003 (-0.6877)	0.0000 (0.3461)
<i>Mretwd</i>	-0.0000 (-0.0288)	-0.0000 (-0.3560)
<i>Logmv</i>	-0.0008*** (-4.4807)	-0.0000 (-1.0612)
<i>Btm</i>	-0.0000 (-0.2924)	-0.0000 (-0.9679)
<i>Turnover</i>	-0.0000 (-0.4180)	0.0000** (2.3322)
<i>Logsales</i>	-0.0002 (-1.3696)	-0.0000 (-0.4006)
<i>Closeprice</i>	0.0000 (0.7279)	-0.0000 (-0.4836)
<i>Lagcum6mret</i>	-0.0001 (-0.8225)	-0.0000 (-0.6385)
<i>Leverage</i>	-0.0000 (-0.5745)	-0.0000 (-0.9938)
<i>Constant</i>	0.0238*** (5.0971)	0.0008 (1.5195)
Firm fixed effects	Yes	Yes
Year-month effects	Yes	Yes
N	54,162	54,162
Adj.R ²	0.017	0.001

Table 9 The Return Predictability of Subsidy Announcements

This table presents the regression results for the return predictability of subsidy announcements. The dependent variable is $Return_{t+1}$, measured as the stock return in year-month $t+1$. Column (1) reports the Fama-MacBeth regression and Column (2) reports the OLS regression. The independent variable is *Subsidy*, a dummy variable that equals 1 if the firm receives any subsidies in a given firm-year-month, and 0 otherwise. Robust t -statistics are reported in parentheses. All continuous variables are winsorized at the 1st and 99th percentiles. Definitions of variables are presented in Appendix B. All control variables are lagged by one month. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable= $Return_{t+1}$	
	(1)	(2)
	Fama-MacBeth	OLS
<i>Subsidy</i>	0.0104** (2.1334)	0.0335*** (-7.2900)
<i>Mretwd</i>	0.0075 (0.4524)	0.0754*** (17.2458)
<i>Logmv</i>	-0.0093*** (-2.9021)	-0.0298*** (-28.1836)
<i>Btm</i>	0.0017** (2.3200)	0.0030*** (3.6961)
<i>Turnover</i>	-0.0177*** (-4.8120)	-0.0427*** (-28.2601)
<i>Logsales</i>	0.0031** (2.2176)	0.0058*** (8.8618)
<i>Closeprice</i>	0.0001 (0.5272)	-0.0002*** (-4.4834)
<i>Lagcum6mret</i>	0.0011 (0.2321)	0.0195*** (9.3354)
<i>Leverage</i>	-0.0000 (-0.2826)	-0.0000 (-0.8927)
<i>Constant</i>	0.1586 (1.5973)	0.6011*** (33.8289)
N	54,160	54,160
Adj.R ²	0.075	0.045

Appendix A: Examples of Subsidy Announcements

Example 1: Sany Heavy Industry Co., Ltd, 2017

Sany Heavy Industry Co., Ltd. is a Chinese multinational heavy equipment manufacturing company headquartered in Hunan Province. It is the third-largest heavy equipment manufacturer in the world, and the first in its industry in China to enter the FT Global 500 and the Forbes Global 2000 rankings. On July 25, 2017, the company issued the following subsidy announcement:

On 21 July 2017, the subsidiary Loudi Zhongyuan New Materials Co., Ltd received a subsidy of RMB 29.83 million from the Lianyuan High-tech Industrial Development Zone Management Committee to reward the company's leading role in supporting the development of the zone. The company received the subsidy on 24 July 2017. According to *China Accounting Standards*, such subsidy is related to income, so will be recognized as "other income" in the 2017 income statement.

Example 2: Jimin Pharmaceutical Co., Ltd, 2017

Jimin Pharmaceutical Co., Ltd. is headquartered in Zhejiang Province. It is a leading and certified pharmaceutical enterprise which manufactures patches, ointments, gels, pastes, and oral solutions. The company issued a subsidy announcement on March 31, 2017:

According to the circular *Zhe Cai Jian [2017] No. 183* issued by the Finance Bureau of Zhejiang Province, the company received a subsidy of RMB 5 million on 31 March 2017, as a special fund for industrial transformation and upgrading projects. According to *China Accounting Standards*, this subsidy will be recognized as "deferred income" in the annual report.

Appendix B: Variable Definitions

Variable	Definition
Dependent variables	
<i>Ratio_Purchase</i>	The number of shares purchased by insiders divided by the total number of shares outstanding in a given firm-year-month.
<i>Ratio_Sale</i>	The number of shares sold by insiders divided by the total number of shares outstanding in a given firm-year-month.
<i>Ratio_Net_Purchase</i>	The number of shares purchased by insiders minus the number of shares sold divided by the total number of shares outstanding in a given firm-year-month.
<i>Ratio_Net_Opportunistic</i>	The number of shares purchased in opportunistic trades minus the number of shares sold, divided by the total number of shares outstanding in a given firm-year-month.
<i>Ratio_Net_Routine</i>	The number of shares purchased in routine trades minus the number of shares sold, divided by the total number of shares outstanding in a given firm-year-month.
Main regressors	
<i>Subsidy</i>	A dummy variable that takes a value of 1 when a subsidy is announced in a given firm-year-month, and 0 otherwise.
<i>No. of title news</i>	The number of news articles that have the focal firm's name in the title in a given firm-year-month.
<i>High_title news</i>	A dummy variable that takes a value of 1 when <i>No. of title news</i> is larger than its industry median in a given firm-year-month, and 0 otherwise.
<i>No. of content news</i>	The number of news articles that have the focal firm's name in the full text in a given firm-year-month.
<i>High_content news</i>	A dummy variable that takes a value of 1 when <i>No. of content news</i> is larger than its industry median in a given firm-year-month, and 0 otherwise.
<i>No. of analysts following</i>	The number of analysts following a firm in a given firm-year.
<i>High_analysts</i>	A dummy variable that takes a value of 1 when <i>No. of analysts following</i> is larger than its industry median in a given firm-year, and 0 otherwise.
<i>No. of analyst reports</i>	The number of analyst reports in a given firm-year.
<i>High_reports</i>	A dummy variable that takes a value of 1 when <i>No. of analyst reports</i> is larger than its industry median in a given firm-year, and 0 otherwise.
<i>Political connection</i>	A dummy variable that takes a value of 1 if the CEO or Chairman is a current or former government official, or the firm is registered in the birthplace of the current provincial Governor or (Chinese Communist) Party Secretary, and 0 otherwise.
Control variables	
<i>Subsidyper</i>	The subsidy amount divided by total sales.
<i>Mretwd</i>	The stock return for the current month.
<i>Logmv</i>	The natural logarithm of the market capitalization of the firm.
<i>Btm</i>	The book value of equity divided by market capitalization.
<i>Turnover</i>	The sum of monthly trading volumes divided by the number of shares outstanding.
<i>Logsales</i>	The natural logarithm of total sales.
<i>Closeprice</i>	The share price at the end of the year-month.
<i>Lagcum6mret</i>	The cumulative stock return for the preceding six months.
<i>Leverage</i>	The book value of debt divided by the book value of equity.

Appendix C Propensity-Score-Matched Sample

We follow previous studies (Armstrong et al., 2010; Cheng et al., 2013) and create a matched sample by employing propensity score matching (PSM). This approach ensures that the subsidized firms (i.e., treatment firms) and unsubsidized firms (i.e., control firms) are similar along a set of firm characteristics, differing only in terms of the receipt of subsidies. To obtain the propensity scores, we first estimate the likelihood of a firm receiving subsidies, by applying the logistic model with all control variables shown in Eq. (1) as independent variables. We then match each treatment observation with the control observation that has the closest score, while imposing a caliper of 0.03 and common support. We repeat the main regression using the propensity-score-matched sample. Panel A reports the first-stage regression results. The probability of receiving subsidies is positively associated with the stock return, sales, and growth opportunities, but negatively associated with market value and leverage. Panel B presents the mean difference between the treatment and control groups, for the purpose of assessing the covariate balance. Following the PSM, all significant differences in the control variables have diminished, indicating desirable matching outcomes. Panel C reports the regression results using the propensity-score-matched sample. As predicted, our main findings remain qualitatively unchanged.

Panel A: Propensity score estimation

	Dependent variable= <i>Subsidy</i>
<i>Mretwd</i>	0.2859** (2.1123)
<i>Logmv</i>	-0.1418*** (-5.5245)
<i>Btm</i>	-0.1074** (-2.1203)
<i>Turnover</i>	0.0258 (0.7986)
<i>Logsales</i>	0.1112*** (7.2435)
<i>Closeprice</i>	-0.0014 (-1.0655)
<i>Lagcum6mret</i>	-0.0212 (-0.3457)
<i>Leverage</i>	-0.0277*** (-3.8964)
<i>Constant</i>	-0.9401*** (-2.0698)
Year-month effects	Yes
N	18,953
Pseudo R ²	0.089

Panel B: Covariate mean differences

	Full sample			Propensity-score-matched sample		
	Subsidy N=1,237	Non-subsidy N=17,716	Diff. in means	Subsidy N=1,237	Non-subsidy N=1,195	Diff. in means
<i>Mretwd</i>	0.0216	0.0207	0.0009	0.0216	0.0170	0.0046
<i>Logmv</i>	22.8860	22.9110	-0.0250	22.8860	22.9090	-0.0230
<i>Btm</i>	0.3948	0.4169	-0.0221	0.3948	0.3837	0.0111
<i>Turnover</i>	0.5980	0.5720	0.0260*	0.5980	0.6071	-0.0091
<i>Logsales</i>	21.7700	21.6070	0.1630***	21.7700	21.7940	-0.0240
<i>Closeprice</i>	15.7900	16.4670	-0.6770**	15.7900	15.7980	-0.0080
<i>Lagcum6mret</i>	0.1148	0.1511	-0.0363***	0.1148	0.1174	-0.0026
<i>Leverage</i>	1.5181	1.7068	-0.1887***	1.5181	1.5412	-0.0231

Panel C: Main regression with propensity-score-matched sample

	Dependent variable= <i>Ratio_Net</i>
<i>Subsidy</i>	0.0007** (1.9821)
Controls	Yes
Firm fixed effects	Yes
Year-month effects	Yes
N	2,432
Adj.R ²	0.042