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# Illegal insider trading profitability and the legal environment

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ABSTRACT

This study examines how provincial legal environments shape the profitability of illegal insider trading in China. Using 521 adjudicated insider-trading cases from 2006 to 2018, we hand-collect detailed information from court judgments and CSRC sanction documents to reconstruct holding-period returns and illicit gains. We combine these data with established provincial indices of legal development and firm-level measures of ex ante litigation risk to test whether legal risk is priced in illegal insider trades. We find that stronger provincial legal environments are associated with significantly higher per-trade profitability among illegal trades that insiders execute after accounting for enforcement risk. This pattern is consistent with a risk-compensation mechanism rather than a failure of enforcement, as stricter legal environments deter low-return trades and leave only trades with sufficiently high expected gains. Firm-level litigation exposure further strengthens this effect. The results remain robust to sample-selection corrections, alternative return measures and a range of heterogeneity tests. Overall, our findings show how institutional variation in enforcement shapes insider incentives and the risk–return trade-off of illegal trading.

"Dorothy: You haven't heard any rumors? Of bribery, embezzlement, misappropriation, INSIDER DEALINGS?
Sir Desmond: Oh…oh come…those are strong words."
—"Yes, Prime Minister", BBC (1987).

## 1. Introduction

Illegal insider trading, where securities trading is based on material non-public information, poses significant risks to market fairness, informational efficiency, and investor confidence. Prior work shows that such trading generates abnormal returns that reflect material informational advantages (Meulbroek, 1992). Although most jurisdictions prohibit insider trading, the effectiveness of enforcement varies widely across countries and regions, especially in emerging markets where legal institutions remain unevenly developed (Bhattacharya and Daouk, 2002). In these environments, insiders face a fundamental decision about whether the expected gains from exploiting confidential information exceed the probability and costs of detection, consistent with the rational-crime framework of Becker (1968). Enforcement quality therefore plays a central role in shaping both the incentives to trade and the profitability of illegal activity (Ahern, 2017; Kacperczyk and Pagnotta, 2019).

In this paper, we examine how regional variation in legal environments influences the profitability of illegal insider trading in China, building on the literature on the rule of law in financial markets (La Porta et al., 1998) and extending recent work on China's governance and regulatory institutions (Allen et al., 2019; Hu et al., 2021, 2024). We construct a novel dataset of 521 adjudicated insider-trading cases from 2006 to 2018, hand-collected from China Securities Regulatory Commission (CSRC) sanction documents and court judgments. These records contain detailed information on trading dates, volumes, execution prices, and illicit gains. We combine these data with established provincial indices of legal development (Wang et al., 2017) and firm-level measures of ex ante litigation risk (Kim and Skinner, 2012) to test whether legal risk is priced in the profitability of illegal insider trades. Our empirical strategy allows us to distinguish between deterrence effects, where stricter enforcement lowers returns, and risk-compensation effects, where insiders demand higher returns to compensate for legal risk.

China provides a unique setting for examining this relationship.

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Since the establishment of the CSRC in 1992,[1] insider-trading regulation has expanded through revisions to the Securities Law, amendments to the Criminal Law, and the introduction of detailed regulatory guidelines. However, enforcement capacity remains heterogeneous across provinces due to differences in legal resources, judicial professionalism, regulatory staffing and the development of market intermediaries (Wang et al., 2017; Lin et al., 2022). At the same time, the CSRC and the court system issue publicly available administrative and judicial decisions that provide detailed descriptions of illegal insider trades. This combination of detailed regulatory records and meaningful cross-provincial variation in enforcement enables us to assess whether legal risk is incorporated into the abnormal gains insiders realize on the trades that occur, after weighing expected penalties against expected benefits.

The existing literature has established that strong legal institutions enhance market development, reduce the cost of capital and improve governance outcomes (La Porta et al., 1998; La Porta et al., 2006). Other studies show that enforcement influences the incidence and profitability of insider trading (Ahern, 2020; Kacperczyk and Pagnotta, 2024). However, little is known about how within-country differences in legal capacity shape the returns insiders earn on detected illegal trades. More specifically, it remains unclear whether stricter legal environments reduce returns by deterring trading altogether or increase the returns of the trades that still occur because insiders require compensation for higher legal risk. Under this mechanism, observed returns reflect only the gains from the trades insiders choose to execute after weighing potential benefits against the risk of detection, meaning that the data captures a selected subset of high-return trades that survive deterrence rather than the full set of potential insider trades.

Our analysis yields two competing predictions. Under a deterrence mechanism, stronger legal environments should reduce the returns from illegal trades by raising expected penalties and limiting insiders' ability to exploit private information before detection. Under a risk-compensation mechanism, however, stricter enforcement discourages low-return trades altogether, so the trades that still occur are those with sufficiently high expected gains to justify the heightened legal risk. In this scenario, the average return of the trades that insiders continue to execute, meaning the trades that remain after weaker opportunities are deterred, would increase as legal risk rises. Firm-level litigation exposure adds an additional layer of legal risk, because insiders at firms that attract greater regulatory scrutiny may demand even higher expected gains before deciding to trade. Together, these considerations motivate the following hypotheses on how insiders adjust their behavior when facing different levels of legal risk:

**H1a**. The profitability of illegal insider-trading decreases with provincial legal risk, as higher expected penalties lower the benefits of trading on inside information.

**H1b**. The profitability of illegal insider-trading increases with provincial legal risk because only high-information, high-return trades remain profitable once legal risk is considered.

**H2**. Firm-level ex ante litigation risk increases the profitability of illegal insider trades that occur, even after considering provincial legal risk.

Hypothesis H1a reflects the idea that stronger enforcement may reduce illegal profits by raising the expected cost of trading, shifting the threshold at which an insider is willing to act. In contrast, H1b recognizes that when legal pressure intensifies, only insiders with unusually precise or valuable information will find trading worthwhile, generating higher profits among the smaller set of trades that occur. Hypothesis H2 emphasizes that enforcement does not operate solely at the regional level. Firms differ in their histories, disclosure quality and exposure to regulatory scrutiny, and these differences create an additional risk dimension that insider's factor into their decisions. Together, these hypotheses imply that insiders do not respond uniformly to legal constraints. Instead, they selectively choose opportunities where information advantages outweigh the combined provincial and firm-level risks, making the relationship between legal exposure and profitability an empirical question rather than a theoretical certainty.

Our findings support the risk-compensation mechanism, as across all three measures of provincial legal environment, stronger legal institutions are associated with significantly higher average returns on the trades that insiders still choose to execute after weighing expected gains against the increased likelihood and cost of detection. A one-standard-deviation improvement in legal environment quality predicts a 2.8–5.8 percentage point increase in abnormal returns. Firm-level litigation risk reinforces this relationship, suggesting that insiders incorporate both regional and firm-specific enforcement risks into their trading decisions. The results are robust to selection corrections, alternative return measures and extensive heterogeneity tests.

This study makes three contributions. First, it provides new evidence that legal risk is priced into illegal insider trades, using rich institutional variation within a major emerging market. Our findings show that insiders act strategically, selecting opportunities where high expected returns justify legal risk, and that a one-percentage-point increase in firm-level litigation risk is associated with an 18.1 basis-point increase in illegal trading returns. Second, we demonstrate that stricter enforcement and higher observed profitability can coexist, not because enforcement fails, but because only high-return trades survive deterrence. This counterintuitive pattern highlights the importance of distinguishing between the overall level of illegal activity and the profitability of the trades that insiders still choose to execute once legal risk is considered. Third, the results show that both provincial legal development and firm-level litigation exposure jointly shape the risk–return trade-off facing insiders. Legal environments influence expected outcomes of illicit activity, reinforcing a rational risk–return framework that explains why observed profits rise even as enforcement intensifies.

These findings have broader implications for the design and evaluation of enforcement in markets characterized by institutional heterogeneity. They suggest that provincial legal institutions and firm-specific legal characteristics both influence misconduct risk, complementing prior evidence that the law shapes financial development not only through investor protections, but also by affecting enforcement outcomes (La Porta et al., 1998; Bosio et al., 2022). Our results also align with studies that show that in regions with uneven legal capacity, governance mechanisms and political ties may partially substitute for formal enforcement in restraining insider behavior. They further imply that combining firm-level monitoring with targeted regional enforcement reforms may provide a more effective deterrent to financial misconduct.

From a policy perspective, aligning legal risk with regulatory goals requires a focus on early detection,[2] enhanced use of risk analytics, stronger judicial coordination and improved whistleblower and civil liability mechanisms. Such measures may help ensure that enforcement not only deters low-return trades but also reduces the profitability of those high-information trades that currently survive deterrence.

The remainder of the paper is structured as follows. Section 2 provides institutional background. Section 3 describes the dataset and empirical design. Section 4 presents the results, Section 5 offers additional analyses and Section 6 concludes.

[1] See Thondkar et al. (2003) for discussion. Also, https://www.sciencedirect.com/science/article/abs/pii/S0897366003160096?via%3Dihub

[2] Note the recent study by Ye et al. (2024) on legal insider traders in China's sell-by-plan mandate and opportunistic insider selling and comparison with U.S. rules.

## 2. Institutional background

China's insider-trading framework has changed significantly over the past three decades, moving from basic administrative rules to a comprehensive system of administrative, civil and criminal enforcement. The establishment of the CSRC in 1992 was the beginning of a more formal regulatory regime. Subsequent reforms clarified the definitions of insiders and inside information, broadened the scope of prohibited conduct and strengthened the legal basis for enforcement. Key initiatives include the 1997 amendment to the Criminal Law introducing explicit criminal liability, the enactment and later revisions of the Securities Law in 1999, 2006 and 2020, and CSRC enforcement guidelines that specify investigative procedures and firm-level compliance requirements (Allen et al., 2015; Allen et al., 2019; Hu et al., 2021). Together, these reforms established a layered enforcement structure involving administrative penalties, private civil remedies and criminal prosecution.

China's earliest insider-trading rules appeared in administrative regulations. The 1990 *Interim Measures for the Administration of Securities Companies* prohibited market manipulation, internal transactions and related misconduct. In 1993, the State Council issued the *Interim Regulations on the Administration of Stock Issuance and Transactions* and the *Interim Measures for Prohibiting Securities Fraud*, which introduced formal definitions of insiders and inside information. Enforcement during this early period remained limited, and relatively few violations were detected (Tondkar, 2003; Huang, 2005).

Between 1997 and 2006, China shifted toward a more structured legal regime. The 1997 Criminal Law amendment provided the first explicit criminal sanctions for insider trading. The 1999 Securities Law and its 2006 revision refined the statutory elements of insider trading, strengthened civil liability provisions and required offenders to compensate investors before paying administrative fines. These reforms expanded the legal basis for sanctions and investor protection, although in practice only a modest number of cases were pursued before 2007 (Ma et al., 2010; Huang, 2013).

A more assertive enforcement era began after 2007. The CSRC issued new guidelines in 2007 and 2011 that expanded the criteria for identifying insiders and required firms to maintain insider-registration systems. The State Council's 2010 *Opinions on Combating, Preventing and Controlling Capital Market Insider Trading* promoted coordinated enforcement across regulatory bodies. The Supreme People's Court and Supreme People's Procuratorate subsequently issued a joint judicial interpretation clarifying evidentiary standards for criminal cases. These measures enhanced institutional capacity and improved consistency in enforcement actions (Wang et al., 2019; Gong et al., 2021; Mazza and Wang, 2021).

The 2020 revision of the Securities Law represents the most recent stage of reform. It raises criminal penalties, lowers thresholds for prosecuting insider trading and broadens the categories of misconduct. Enforcement activity increased following its implementation, although administrative fines continue to dominate and often match the illicit gains, which limits deterrence (Huang et al., 2022). Despite the increasingly sophisticated legal architecture, enforcement practices still vary across regions due to differences in regulatory resources, judicial professionalism and intermediary development.

Overall, China now maintains a comprehensive legal framework for insider-trading regulation, but uneven enforcement capacity across provinces remains a defining feature of its institutional landscape. This heterogeneity forms the basis for the variation in detection and punishment risk observed in the adjudicated cases analyzed in this study and provides a central element of the empirical setting.

## 3. Data and research design

### 3.1. Sample selection

The cases of illegal insider trading used in this study are hand-collected from legal documents issued and archived by China's courts and other regulatory bodies, including court judgments and filings of administrative sanctions issued by the CSRC. We begin by collecting judgment documents of insider trading cases from two vendors: PKULAW and Lawyee,[3] which are widely used in finance and legal research (see for example: Lim et al., 2017; Xu, 2017).

To retrieve the judgment documents related to illegal insider trading from these databases, we use "insider trading" as search keywords and retrieve relevant legal documents. For cases that are recorded in multiple legal documents with various judgment results (i.e., first instance, second instance and retrial), only the final legal document is kept in the sample. We carefully read each individual case to identify the details of individual trading as well as the information of companies that are exposed to enforcement actions to ensure the information is relevant for this analysis.

We then supplement this data by collecting information on administrative penalties issued by the CSRC. Incorporating data on administrative sanctions allows us to capture cases that may differ significantly in terms of severity and complexity compared to those investigated by courts. To ensure the accuracy of our estimation of insider trading profitability, we apply certain criteria in the sample selection process. Cases lacking specific transaction dates for insider trading, those with a time gap exceeding six months between buying and selling the stock, or those involving trading securities other than common stocks are excluded from the analysis.[4]

The final sample consists of 312 companies involved in 521 insider trading cases, covering the period from 2006 to 2018.[5] The sample, starting in 2006, shows a rise in disclosed insider trading cases from around 30 per year before 2012 to about 60 per year afterward. Abnormal returns, discussed later in detail, from illegal trading also became more volatile in recent years, suggesting more rigorous enforcement post-2012. The 2019 revision of the Securities Law also expanded the definition of what constituted an insider, and insider information, as well as increasing penalties. Article 180 of China's Criminal Code establishes criminal liability for insider trading but lacked clarity on what constitutes a "serious" offense until the Supreme Court clarified this in 2012. These changes subsequently impacted enforcement and insider trading activities.[6]

Fig. 1 illustrates the frequency of insider trading cases by the region in which the shares of listed companies are registered. Our analysis reveals a direct correlation between the regional legal environment and the number of illegal insider trading cases in each region. This supports the notion that resource constraints may hinder the regulator's ability to effectively enforce regulations, as regions with less developed legal systems are likely to have fewer resources for monitoring and prosecuting insider trading activities.

[3] https://home.pkulaw.com/; http://www.lawyee.org/

[4] Note we do not have information on insiders' trading activities before earnings announcements documents and so are unable to investigate how insider opportunism acts as a channel influencing illegal insider trading profitability (see Ali and Hirshleifer (2017) or Cohen et al. (2012)).

[5] The 521 cases included in our analysis do not contain any insider sales transactions. While our original legal documents do include 21 cases of insider sales, the information necessary to calculate the Buy-and-Hold Abnormal Return (BHAR) for these cases is incomplete.

[6] The authors would like to thank an anonymous reviewer for this suggestion.

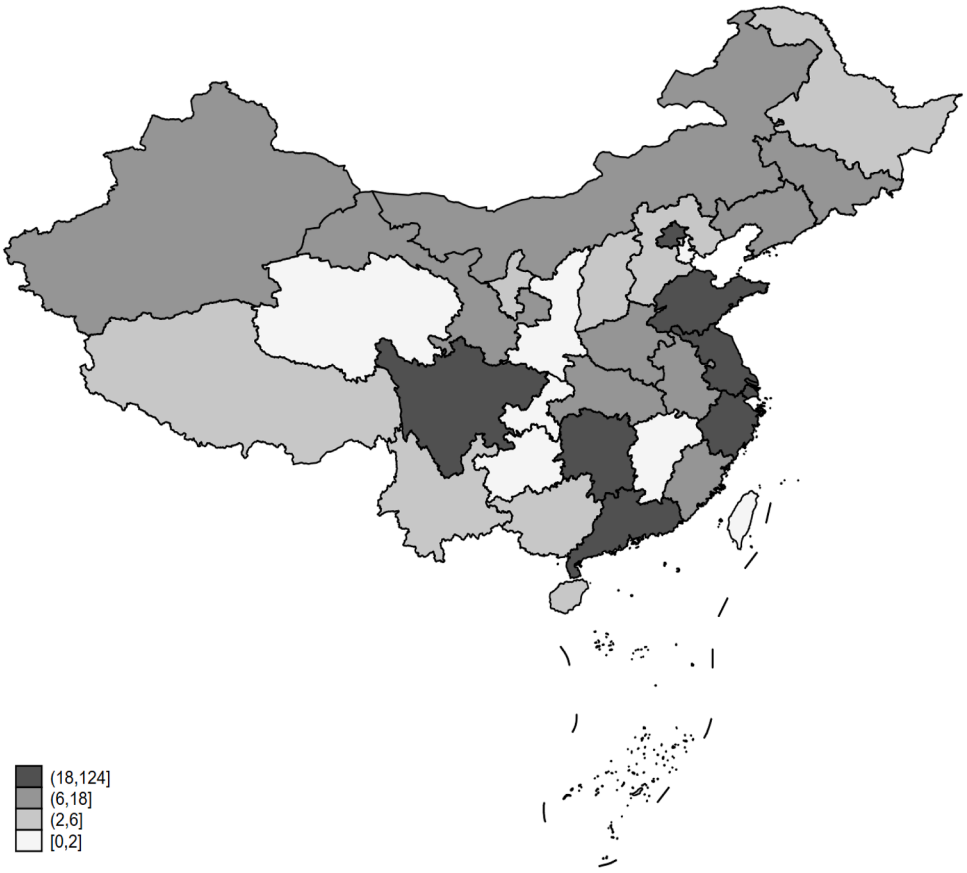


**Fig. 1.** Frequency of illegal insider trading in provinces in China, 2006–2018.
*Note:* The figure plots the frequency of insider trading by the region where the shares of listed companies are registered. Regions with a developed rule of law tend to also have better economic development and higher levels of information transparency. The regional legal environment is directly correlated with the number of illegal insider trading cases.

### 3.2. Variables construction

#### 3.2.1. Dependent variable

Insider Trading Excess Returns: The return of illegal insider trading (adjusted gains from illegal insider trading) can be found directly in legal documents or calculated based on the trading volume and stock price in each case, which are common criteria for convictions. We calculate the holding period raw insider trading return ($ret_{Raw_i}$) in each case based on the number of shares traded, the amount of illegal income and trading dates, as revealed in legal documents:

$$ret_{Raw_i} = \frac{Amount\ of\ illegal\ income_i}{Trading\ volume_i{}^{*}Closing\ price_{i\_PurchaseDay}} \quad (1)$$

Next, to estimate the excess return earned by insider traders based on nonpublic information, we construct buy-and-hold abnormal return ($BHAR_i$), calculated as the difference between the raw return and the return during the insider trading holding period ($ret_{Benchmark_i}$).

$$ret_{benchmark_i} = \frac{Closing\ price_{i\_SellDay} - Closing\ price_{i\_PurchaseDay}}{Closing\ price_{i\_PurchaseDay}} \quad (2)$$

As shown in the legal documents of several cases, insider trading occurs on various days. For those cases, the average daily closing prices during trading dates are estimated.

#### 3.2.2. Main independent variables

Legal Environment: We measure legal risk using three proxies for the provincial legal environment in China. A better local legal environment implies greater availability of legal resources and stricter enforcement, which increases the risk exposure for potential insiders. First, we obtain data based on the Marketization Index of China, as proposed by Wang et al. (2017). This index provides a comprehensive measure of the legal environment, capturing elements such as the development of the rule of law, regulatory enforcement, and the efficiency of legal institutions across different provinces in China.[7]

The index is composed of five subcategory indicators where the section "market intermediaries and legal environment" comprises two indices, the development of market intermediaries such as law companies, claims adjusters, association of lawyers and other institutions ($LAW^{Institution}$) at provincial-level, and the provincial-level of legal environment ($LAW^{Environment}$). The index is widely used in prior studies investigating the relationship between local legal environment and risk on economic development, provincial financial development, and companies' fraudulent activities (Guo et al., 2021; Shen et al., 2022).

This study provides additional evidence on the role of regional legal environment and risk in shaping investor behavior and market efficiency. To test the effect of the accessibility of local non-public judicial resources on the efficiency of law enforcement, the index of provincial judicial resources ($LAW^{Resources}$) of Gao et al. (2016) is also used. This index is constructed based on the number of lawyers and the number of offices that provide legal services at a provincial level in China.

*Ex ante* Litigation Risk: We employ a methodology based on Kim and Skinner (2012) and Dai et al. (2016) to estimate ex ante litigation risk at the company level. Using probit regression, we estimate the probability of a company's exposure to regulatory penalties due to accounting and

[7] The data of local legal environment is continuously updated on a two-year basis and available at https://cmi.ssap.com.cn/.

financial misconduct (lnRISK). This approach allows us to assess the likelihood of companies facing regulatory sanctions based on historical data for all sample companies during the study period and allows a better understanding of the relationship between insider trading profitability and companies' exposure to legal risk. We then use the predicted values from the probit model as a measure of company-level ex ante litigation risk. The data on administrative penalties are sourced from the CSRC, which provides information on target companies' violations of laws and regulations. We then use the predicted value to measure company-level *ex ante* litigation risk.[8]

### 3.2.2. Control variables

We follow prior research in accounting for the determinants of stock returns, including ownership structure, company size, book-to-market ratio, past returns, and other relevant variables. These data are sourced from the China Stock Market & Accounting Research (CSMAR) database. In line with Kacperczyk and Pagnotta (2024), we construct case-level characteristics, such as stock holding length, the number of participants, and the financial backgrounds of insiders, using legal documents. We merge the data from legal documents with company characteristics using stock names as identifiers and ensure a two-month lag between the dependent variable and company fundamentals to account for the disclosure and public availability of company information. Table 1 summarizes the data used in this study.

### 3.2.3. Regression models

In our research design, we employ two different regression models to verify the mechanism driving the factors influencing insider trading excess return. The Models (3) and (4) represent the baseline specifications. Model 3 includes only the provincial legal risk variable, while Model 4 incorporates all control variables related to company characteristics, along with industry and year fixed effects. By comparing the results from these two models, we can assess the potential impact of omitted variables on our analysis. Additionally, to address biases and establish causal relationships, we use lagged company characteristics variables in the regression. This approach aims to enhance the robustness and reliability of our findings. The baseline models are defined as follows:

$$BHAR_{i,j,t} = \alpha_0 + \alpha_1 LAW_{i,\ j,t} + Ind_{i,t} + Year_t + \varepsilon_{i,j,t} \tag{3}$$

$$BBHAR_{i,j,t} = \alpha_0 + \alpha_1 LAW_{i,j,t} + a_2 Firm\ Characteristics_{i,j,t} + Ind_{i,j,t} + Year_t + \varepsilon_{i,j,t} \tag{4}$$

where, in model (4), *Law* represents the indicators of the legal risk ($LAW^{Institution}$, $LAW^{Environment}$, $LAW^{Resources}$) of the province where company *j* is registered in year *t*, and *i* proxies for the insider trading cases.

### 3.2.4. Summary statistics

Fig. 2 and Table 2 provide the summary statistics for the main variables used in this study. The average excess insider trading return, as shown in Fig. 2, is negative in 2008, 2009, and from 2016 to 2018, indicating that illegal insider traders do not outperform the market even when they trade using nonpublic information. This finding aligns with the phenomenon identified by Sha et al. (2020) regarding the “puzzle of low returns of illegal insider trading” in the Chinese stock market. For the control variables, we observe significant variation across different provinces in China. Provinces with well-developed legal environments tend to also have higher levels of economic development and greater information transparency. Moreover, we find a positive relationship between the development of the legal environment and the proportion of insider trading cases.

Table 2 provides statistics on the types of insider information in our sample. It shows that 18.8 % of cases are linked to traceable Merger and Acquisition (M&A) events, reflecting the "shell company" nature of many target companies and a high level of uncertainty during M&As in China (Liu et al., 2019). Regarding other firm characteristics, the average book-to-market ratio for companies involved in insider trading is only 0.393, and their Return on Equity (ROE) is 0.002, indicating that these companies tend to be overvalued and less profitable. Additionally, institutional ownership is low, with approximately 30 % of these companies being state-owned.

Before performing regression analysis, we conduct a univariate analysis to explore the potential relationship between the distribution of excess insider trading returns and the legal environment. The sample is divided into high and low groups based on the median value of three legal environment proxies. The high-level group represents regions or provinces with a well-developed legal environment, while the low-level group refers to areas with a less developed legal environment. Table 3 presents the variations in excess insider trading returns between the

**Table 1**
Variable definitions.

| Variable | Symbol | Definition |
|---|---|---|
| Dependent variable | | |
| Excess return of illegal insider trading | *BHAR* | Illegal insider trading gains minus stock returns over the holding period |
| Main independent variable | | |
| Market development index | $LAW^{Institution}$ | Provincial market development index of Fan et al. (2009; 2011; 2013; 2015; 2017). |
| Legal environment index | $LAW^{Environment}$ | Provincial legal environment index of Fan et al. (2009; 2011; 2013; 2015; 2017). |
| Legal resources index | $LAW^{Resources}$ | Provincial legal facilities |
| Ex-ante risk of violation of regulations | *lnRISK* | Natural logarithm of the probability of legal actions brought by regulators |
| M&A event | *DRINFO* | Dummy that equals 1 if insider trading is based on traceable M&A event and 0 otherwise |
| Financial literacy | *DFINANCE* | Dummy that equals 1 if insider trader has finance-related background and 0 otherwise |
| Control variables | | |
| Institutional ownership | *FUND* | Percentage of shares owned by institutional investors |
| State ownership | *DSOE* | Dummy that equals 1 if the firm’s ultimate controller is the state and 0 otherwise |
| Size | *lnME* | Natural logarithm of firm’s market capitalization in million RMB |
| Book-to-market ratio | *lnBE/ME* | Natural logarithm of firm’s book-to-market ratio |
| Past return | *MOM* | Cumulative stock return over 6 months prior to insider trading month |
| Turnover ratio | *TURNOVER* | Average daily stock turnover ratio over 25 days prior to insider trading date |
| Leverage ratio | *DEBT/ASSET* | Ratio of firm’s total debt divided by total assets |
| Return on equity | *ROE* | Net income divided by the book value of shareholder equity |
| Liquid asset ratio | *CASH/ASSET* | Ratio of firm’s cash holding divided by total assets |
| Firm age | *AGE* | Number of years firm has been in operation |

Note: Table 1 displays the definitions of the main variables used in this paper. We winsorize continuous independent variables at the 1 % and 99 % levels.

[8] Specifically, we run a regression in which the dependent variable equals one if a regulatory punishment decision is filed against a company each year and zero otherwise. The independent variables include company size, sales growth rate, daily turnover, cumulative returns standard deviation of daily returns, skewness of daily returns and indicators for special treated (ST) companies. All independent variables are lagged one year to alleviate concerns over endogeneity.

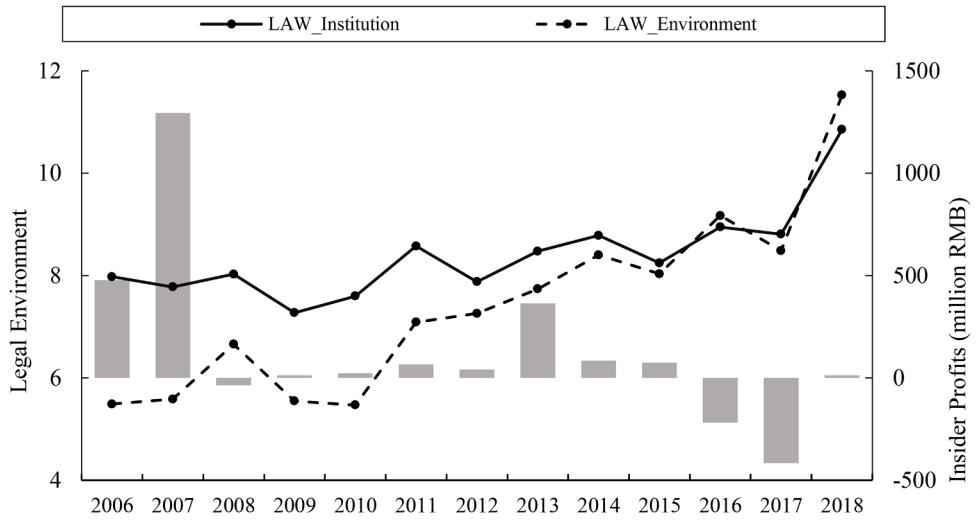


**Fig. 2.** Profits from illegal insider trading and the provincial law environment, 2006–2018.
Note: The figure plots insider trading profitability by years in which the trading occurred. $LAW^{Institution}$ and $LAW^{Environment}$ are proxies for the quality of the legal environment from Wang, Fan and Yu (2017). See Table 1 for variable definitions.

**Table 2**
Summary statistics.

| Variable | Obs | Mean | Std | Min | Max |
|---|---|---|---|---|---|
| *BHAR* | 521 | −0.114 | 0.676 | −3.774 | 11.567 |
| $LAW^{Institution}$ | 478 | 9.218 | 4.527 | −0.200 | 19.110 |
| $LAW^{Environment}$ | 478 | 8.831 | 4.446 | −0.200 | 16.940 |
| $LAW^{Resources}$ | 491 | 1.047 | 2.843 | −1.211 | 9.893 |
| *lnRISK* | 493 | 0.037 | 0.016 | 0.018 | 0.098 |
| *DFINANCE* | 521 | 0.100 | 0.300 | 0 | 1 |
| *DRINFO* | 521 | 0.188 | 0.391 | 0 | 1 |
| *FUND* | 521 | 1.442 | 2.335 | 0 | 8.163 |
| *DSOE* | 521 | 0.296 | 0.457 | 0 | 1 |
| *lnME* | 521 | 22.149 | 0.926 | 20.682 | 23.881 |
| *lnBE/ME* | 521 | 0.393 | 0.153 | 0.131 | 0.661 |
| *MOM* | 521 | 0.168 | 0.324 | −0.326 | 0.825 |
| *TURNOVER* | 521 | 1.889 | 1.359 | 0.434 | 5.401 |
| *DEBT/ASSET* | 521 | 0.469 | 0.241 | 0.062 | 0.888 |
| *ROE* | 521 | 0.002 | 0.098 | −0.350 | 0.101 |
| *CASH/ASSET* | 521 | 0.546 | 0.215 | 0.138 | 0.883 |
| *AGE* | 521 | 16.430 | 4.707 | 8.844 | 26.195 |

Note: This table lists the descriptive statistics of the sample. The full sample includes 521 observations from 2006 to 2018. See Sections 3.2.2 and 3.3 for the construction of variables. All continuous variables are winsorized at the 1st and 99th percentiles.

**Table 3**
Insider trading excess return and legal environment: univariate tests.

| Group | Tests for Differences of Mean | | | Tests for Differences of Median | | |
|---|---|---|---|---|---|---|
| | N | Mean | Difference | N | Median | Difference |
| Panel A. Group by $LAW^{Institution}$ | | | | | | |
| Low | 282 | −0.137 | 0.085*** | 282 | −0.059 | 0.044*** |
| High | 196 | −0.053 | | 196 | −0.015 | |
| Panel B. Group by $LAW^{Environment}$ | | | | | | |
| Low | 284 | −0.138 | 0.088*** | 284 | −0.051 | 0.033*** |
| High | 194 | −0.050 | | 194 | −0.018 | |
| Panel C. Group by $LAW^{Resources}$ | | | | | | |
| Low | 287 | −0.127 | 0.032 | 287 | −0.051 | 0.021* |
| High | 204 | −0.095 | | 204 | −0.029 | |

Note: This table reports the average and median insider trading excess returns for low and high-level legal environment groups as well as their differences. The sample is divided into high and low-level groups according to the median value of the legal environment indices of firms involved in illegal insider trading cases in each year. The statistics for $LAW^{Institution}$, $LAW^{Environment}$ and $LAW^{Resources}$ are reported in Panels A, B and C, respectively. Tests for the differences in the mean and median across different groups were performed using a Chi-square test. Statistical significance at the 1 %, 5 %, and 10 % levels is indicated by ***, **, * respectively.

high-level and low-level groups. The data analysis highlights how differences in the legal environment impact the profitability of insider trading in the two groups.

The table also includes the significance of the differences in excess returns between the two groups. The mean and median values of excess insider trading return in the high-level group in terms of the legal environment ($LAW^{Institution}$ and $LAW^{Environment}$) are higher than those in the low-level group, and both differences are significant at the 1 % level. For the index of legal resources ($LAW^{Resources}$), which reflects the availability of non-public legal resources, the mean value of excess insider trading return for the high-level group is still significantly higher than that of the low-level group. Hence, this univariate test suggests that the higher the legal risk of detection and prosecution faced by insiders, the higher the excess return.

## 4. Empirical results

### 4.1. Legal environment and excess return of insider trading

To examine how the legal environment shapes illegal insider-trading profitability, we estimate the cross-sectional regressions in model (4). Table 4 reports the coefficients on the three provincial legal-environment indices ($LAW^{Institution}$, $LAW^{Environment}$ and $LAW^{Resources}$) in columns 1 to 3. Across all specifications, the coefficients on the provincial legal-environment measures are positive and statistically significant. This indicates that insiders earn higher excess returns in provinces with more developed legal environments. The positive association remains after accounting for firm characteristics, case features and market conditions, suggesting that enforcement risk is an important determinant of insider-trading profitability.

The estimated magnitudes are economically meaningful since a one-standard-deviation increase in provincial legal development corresponds to a 2.77 %–5.78 % increase in excess returns. Given that the average transaction size in our sample exceeds RMB 54 million (not tabulated and about USD7.7 million), differences in provincial legal conditions translate into substantial variation in illicit gains. This pattern is consistent with a selective trading mechanism in which stronger legal environments reduce the number of illegal trades executed, but insiders with access to original, high-quality information still trade when expected gains exceed expected penalties, generating

**Table 4**
Insider trading excess return and legal environment: regression analysis.

| | Dependent variable: *BHAR* | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $LAW^{Institution}$ | 0.011*** | | | 0.012*** | | |
| | (0.002) | | | (0.003) | | |
| $LAW^{Environment}$ | | 0.013*** | | | 0.013*** | |
| | | (0.002) | | | (0.003) | |
| $LAW^{Resources}$ | | | 0.009*** | | | 0.008** |
| | | | (0.003) | | | (0.003) |
| *FUND* | | | | 0.005 | 0.006 | 0.0003 |
| | | | | (0.005) | (0.005) | (0.006) |
| *DSOE* | | | | −0.014 | −0.013 | −0.057** |
| | | | | (0.027) | (0.027) | (0.026) |
| *lnME* | | | | 0.026 | 0.026 | 0.032 |
| | | | | (0.019) | (0.019) | (0.021) |
| *lnBE/ME* | | | | −0.300*** | −0.295*** | −0.284*** |
| | | | | (0.095) | (0.095) | (0.091) |
| *MOM* | | | | 0.028 | 0.025 | 0.092** |
| | | | | (0.042) | (0.041) | (0.041) |
| *TURNOVER* | | | | 0.016 | 0.017* | 0.008 |
| | | | | (0.010) | (0.010) | (0.010) |
| *DEBT/ASSET* | | | | −0.009 | −0.014 | 0.067 |
| | | | | (0.070) | (0.070) | (0.072) |
| *ROE* | | | | −0.232 | −0.245* | −0.107 |
| | | | | (0.142) | (0.142) | (0.145) |
| *CASH/ASSET* | | | | 0.059 | 0.042 | 0.137** |
| | | | | (0.056) | (0.055) | (0.062) |
| *AGE* | | | | −0.005** | −0.005** | −0.006** |
| | | | | (0.002) | (0.002) | (0.002) |
| Industry Effect | Yes | Yes | Yes | Yes | Yes | Yes |
| Year Effect | Yes | Yes | Yes | Yes | Yes | Yes |
| Constant | −0.235** | −0.234** | −0.042 | −0.757* | −0.760* | −0.692 |
| | (0.116) | (0.116) | (0.125) | (0.458) | (0.457) | (0.436) |
| Adj. $R^2$ | 0.155 | 0.162 | 0.139 | 0.200 | 0.207 | 0.191 |
| *N* | 478 | 478 | 491 | 478 | 478 | 491 |

Note: This table presents the regression results on the impact of provincial legal environment development on excess insider trading returns. Variable definitions are provided in Table 1. All regressions include industry and year fixed effects. Standard errors, shown in parentheses, are adjusted for clustering at both the firm and year levels. Statistical significance at the 1 %, 5 %, and 10 % levels is denoted by ***, **, and *. For brevity, the regression results for model (3) are omitted but are available upon request.

higher per-trade returns (Gębka et al., 2017).

These results support the interpretation that provincial legal institutions affect the conditional profitability of illegal trades. Stricter legal environments deter marginal insiders whose expected profits do not compensate for detection risk. Insiders who continue to trade in these environments are those with especially precise or valuable information that generates unusually high expected gains. As a result, the composition of observed trades shifts toward high-information, high-return events, even though total illegal profits and the expected (penalty-adjusted) return for a representative potential insider may fall.[9] Our findings therefore capture a selection mechanism consistent with the rational-crime framework and do not imply that stronger enforcement increases overall illegal activity. Instead, the results show that profitability rises among the smaller subset of trades that survive heightened deterrence, since when enforcement becomes stricter, only insiders with exceptionally valuable information find it worthwhile to trade, and these remaining trades inherently generate higher excess returns because low-return opportunities are screened out by legal risk.

### 4.2. Legal environment and excess return of insider trading: the role of company-level ex ante litigation risk

The above analysis demonstrates that variations in the provincial legal environment can explain the excess return of insider trading. These findings provide valuable insights into the mechanisms linking legal regulations, enforcement practices, and perceptions of risk and return. We next examine the channels through which insiders internalize legal risk. The uneven development of economic growth and legal environments across different provinces in China significantly affects the overall efficiency of financial markets. As noted earlier, provinces with more developed legal environments tend to enforce insider trading regulations more strictly, leading to higher detection and punishment rates for illegal activities. This, in turn, increases the costs and risks associated with engaging in insider trading, potentially deterring some individuals from committing these illegal acts.

When the legal environment more effectively upholds the rule of law, enforces contracts, ensures transparency, and protects rights, the likelihood that illegal insider trading activities conducted by companies will come under scrutiny increases. This association stems from several factors. A well-developed legal environment typically implies stronger law enforcement, improved regulatory capabilities, and more effective mechanisms for detecting and investigating financial misconduct (Aitken et al., 2015; Adams et al., 2018). In such regions, legal authorities and securities regulators are more likely to proactively pursue insider trading cases and other illegal activities, thereby heightening the risk of detection for those engaging in such practices.

Chinese authorities have also provided a clear message of zero tolerance towards financial misconduct,[10] especially for high-profile companies. This serves as a deterrent to potential insiders, as they are aware of the higher likelihood of being detected and prosecuted. Consequently, the incremental risk of detection and punishment at the

[9] We thank an anonymous reviewer for this interpretation

[10] See for example: https://www.reuters.com/markets/asia/china-securities-regulator-step-up-fraud-crackdown-2024-02-23/

company level may discourage insider traders from attempting to exploit non-public information for illegal gains.

Considering these factors, it is necessary to determine the corresponding risk premium when assessing the expected return of insider traders. Based on Model (4), we further examine the incremental effect of company-level litigation risk:

$$Med = \beta_0 + \beta_1 Law + \beta_1 Firm\ Characteristics + Ind + Year + \varepsilon \quad (5)$$

$$BHAR = \gamma_0 + \gamma_1 Med + \gamma_2 Law + \gamma_3 Firm\ Characteristics + Ind + Year + \varepsilon \quad (6)$$

*Med* is the mediation variable, and we use *ex ante* litigation risk to measure the probability of insider traders' activities being detected by regulators. The controlling variables of company characteristics are consistent with those in the model (4).

Consequently, the impact of the legal environment on companies' litigation risk ($\beta_1$) is tested in model (5), which indicates the likelihood of detection for insider trading. Legal risk is added to the explanatory model of excess insider trading return (model 6), and the significance of its coefficient ($\gamma_1$) is determined. If both $\beta_1$ and $\gamma_1$ are significant, then $\gamma_2$ in model (6) is examined to test the validity of mediator. If $\gamma_2$ is nonsignificant, the risk of violation functions as a complete mediator. Alternatively, if $\gamma_2$ is significant, the risk of violation functions as a partial mediation effect. Finally, if either $\beta_1$ or $\gamma_1$ is insignificant, a bootstrap test will be conducted.

Table 5 reports the regression results of Model (5). Both the level of the legal environment and the availability of legal services are positively associated with the risk of being investigated for insider trading at the company level. Specifically, when the level of the legal environment increases by one standard deviation, the likelihood that an insider trader is investigated rises by 1.99 % to 2.66 %. This result is consistent with the findings of Sun et al. (2021), who also examine the impact of a company's legal risk on investor behavior and demonstrate that the institutional environment positively influences the governance of listed companies' regulatory violations.

Table 6 presents the regression results of Model (6), which includes a mediator variable of company-level legal risk in addition to the variables from Model (4). The inclusion of the mediator variable allows for the exploration of the channel through which the provincial legal environment influences insider traders' returns. This approach provides valuable insights into the underlying mechanisms by which legal environment factors impact insider trading profitability in China's capital market.

**Table 5**
Legal environment and litigation risk.

| | Dependent variable: ln*RISK* | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| $LAW^{Institution}$ | 0.005** | | |
| | (0.002) | | |
| $LAW^{Environment}$ | | 0.005* | |
| | | (0.002) | |
| $LAW^{Resources}$ | | | 0.007* |
| | | | (0.004) |
| Firm Characteristics | Yes | Yes | Yes |
| Industry Effect | Yes | Yes | Yes |
| Year Effect | Yes | Yes | Yes |
| Constant | −1.264*** | −1.259*** | −1.657*** |
| | (0.436) | (0.437) | (0.457) |
| Adj. $R^2$ | 0.694 | 0.694 | 0.572 |
| *N* | 455 | 455 | 464 |

Note: This table presents the regression results on the impact of provincial legal environment development on firm-level legal risk. Variable definitions are provided in Table 1. All regressions include industry and year fixed effects, which are not reported. Standard errors, shown in parentheses, are adjusted for clustering at both the firm and year levels. Statistical significance at the 1 %, 5 %, and 10 % levels is denoted by ***, **, and *, respectively.

The coefficients reported in Table 6 represent the estimated effects of each variable, including the provincial legal environment indices, company-level litigation risk, and other control variables, on insider traders' returns. We find that both the development level of the provincial legal environment and companies' legal risk are significantly and positively correlated with excess insider trading return, with both being significant at the 5 % level. This result is consistent with the expectation that company-level legal risk is a risk factor that insider traders must consider when evaluating any financial benefits from trading. Table 6 therefore supports hypothesis 2 (H2), showing that company-level legal risk has an incremental effect on the relationship between legal risk and insider trading returns. Specifically, a one-percentage-point increase in the litigation risk of the company targeted by the insider information is associated with an increase of 17.2 basis points (coefficient of *lnRisk* is 0.172 in column 3, Table 6) to 18.1 basis point (coefficient of *lnRisk* is 0.181 in column 1) increase in committing certain illegal insider trading.

### 4.3. Robustness tests

#### 4.3.1. Control for sampling bias

To test the mediation effect, we estimate the indirect effect of the provincial legal environment on insider traders' returns through company-level legal risk. If the indirect effect is statistically significant and the direct effect of the legal environment on insider traders' returns becomes non-significant or decreases after accounting for the mediator, it suggests that company-level legal risk partially or fully mediates the relationship. To address sampling bias due to limited observations, we use a bootstrap method to construct the inference parameters of the statistics. These results are reported in Appendix A1 and show that while the bootstrap method yields statistics lower than those of the *t*-tests, the impact of the legal environment variables on insider trading gains remains significant and positive.

We also follow Wang (2013) and Cline and Posylnaya (2019) and apply the Heckman estimation to address bias caused by missing samples. We use Heckman estimation in this research due to the partial observability of the sample, as some insider traders may go undetected and unprosecuted, leading to a biased sample that does not fully represent the true population of insider trading cases. In this context, the purpose is to estimate the influence of the construction of the rule of law

**Table 6**
Insider trading excess return and legal environment: the role of *Ex Ante* litigation risk.

| | Dependent variable: *BHAR* | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| *lnRISK* | 0.181*** | 0.180*** | 0.172*** |
| | (0.049) | (0.049) | (0.041) |
| $LAW^{Institution}$ | 0.013*** | | |
| | (0.002) | | |
| $LAW^{Environment}$ | | 0.014*** | |
| | | (0.002) | |
| $LAW^{Resources}$ | | | 0.008** |
| | | | (0.003) |
| Firm Characteristics | Yes | Yes | Yes |
| Industry Effect | Yes | Yes | Yes |
| Year Effect | Yes | Yes | Yes |
| Constant | −0.125 | −0.130 | −0.329 |
| | (0.418) | (0.415) | (0.421) |
| Adj. $R^2$ | 0.237 | 0.244 | 0.221 |
| *N* | 455 | 455 | 464 |

Note: This table presents the regression results on the impact of provincial legal environment development on excess insider trading returns, accounting for the mediating effects of firm-level legal risk. Variable definitions are provided in Table 1. All regressions include industry and year fixed effects, which are not reported. Standard errors, shown in parentheses, are adjusted for clustering at both the firm and year levels. Statistical significance at the 1 %, 5 %, and 10 % levels is denoted by ***, **, and *, respectively.

($x$) on excess insider trading return ($y$) in terms of the statistical population:

$$y = \alpha + \beta_1 x + \beta X + \varepsilon \tag{7}$$

However, the influence can only be observed when insider trading cases are observable ($S = 1$):

$$Sy = S\alpha + \beta_1 Sx + \beta SX + S\varepsilon \tag{8}$$

Since whether insider trading is investigated by regulators is a binary variable, the condition for obtaining an unbiased $\beta_1$ from model (8) is the extent that $\varepsilon$ and $Sx$ are uncorrelated. Here, the determining factor of whether insider trading is investigated is defined as follows:

$$S = F(X',\ \varepsilon') + \eta \tag{9}$$

In model (9), $X'$ is an observable controlling variable, while $\varepsilon'$ is the choice factor that is unobservable in the sample data. $F(X',\ \varepsilon')$ is the function that determines whether insider trading is likely to be discovered by regulators. Under the circumstance that $X'$and $X$ may have partial overlap, the estimation of the first model is biased if a certain omitted variable interferes with the process of estimating $\varepsilon$ and $\varepsilon'$ simultaneously.

Heckman's two-step method is an effective approach to address the estimation bias caused by sampling bias in insider trading cases. It is widely used to correct issues such as selection bias and omitted variable bias, especially when the data set is incomplete or truncated. Wang (2013) applied a similar principle in the context of fraudulent activities in the U.S. capital market, addressing the partial observability problem.

When working with data that has a truncated or censored distribution, such as insider trading cases where some cases remain undetected, the inverse Mills ratio (IMR) is commonly used in the first stage of Heckman's two-step procedure and helps adjust for selection bias by capturing the correction for the non-random selection of cases. In the second stage of the Heckman procedure, we include this ratio as an additional explanatory variable to correct for selection bias and obtain more accurate estimates of the relationships between the legal environment and insider trading returns. By including it, we control potential underreporting of high-profit insider trading cases and mitigate bias introduced by the partial observability of insider trading.

$$IMR = E(\varepsilon|D) = f(x) = \begin{cases} \varphi(F(X',\ \varepsilon')/\phi(F(X',\ \varepsilon')),\ if\ S = 1 \\ -\varphi(F(X',\ \varepsilon')/(1 - \phi(F(X',\ \varepsilon')),\ if\ S = 0 \end{cases} \tag{10}$$

$\varphi(\cdot)$ and $\phi(\cdot)$ are the density function and the cumulative distribution function of a standard normal distribution, respectively.

The partial observability of insider trading, as highlighted by studies such as Biggerstaff et al. (2020), Cline and Posylnaya (2019), and Fama and French (2010), can arise from the failure to detect insider trading due to ineffective law enforcement, as noted by Biggerstaff et al. (2020) and Kacperczyk and Pagnotta (2024). Furthermore, to mitigate the consequences of their illegal actions, insider traders may choose to cooperate with authorities by voluntarily confessing to crimes that have not yet been fully investigated. This self-reporting, often accompanied by evidence not previously available to judicial authorities, can sometimes lead to leniency in sentencing or reduced penalties for the insider traders. While China does not have a formal "plea bargaining" system as seen in other jurisdictions, the phenomenon of suspects voluntarily confessing in exchange for leniency is not uncommon in insider trading cases. This mechanism, although not codified, is utilized by some defendants seeking to secure more favorable outcomes in their legal proceedings (Mazza and Wang, 2021).

Thus, the potential for partial observability arises when insider traders engage in self-reporting to mitigate penalties, and the corresponding legal cases might not fully reflect the actual extent of insider trading in the market. This could lead to underestimation of the true profitability and occurrence of insider trading, as some high-profit, high-return cases may be excluded from public observation due to the lack of detection or formal legal action.

Following Cline and Posylnaya (2019), we examine the probability of involvement in illegal insider trading activities ($Prob(S_{litigation} = 1)$) for all companies in the capital market, identifying them through the probit model. To identify insider trading, we use company characteristic variables (*Firm Characteristics*), including a company's ratio of shares held by institutional investors, whether its ultimate controlling owner is a state-owned enterprise, etc. Model (9)'s empirical analysis model is thus expanded and estimated as follows:

$$Prob\ (S_{litigation} = 1) = a + b_1 Firm\ Characteristics + \eta \tag{11}$$

The issue of partial observability in illegal insider trading arises in part because certain instances of insider trading with exceptionally high returns may go undetected, thereby escaping punishment and resulting in omitted observations with high profitability. This phenomenon is acknowledged in the literature, with Fama and French (2010) and Huang et al. (2019) suggesting that both the luck and anti-detection trading skills of insider traders can increase the likelihood of earning extremely high profits.

Insiders who can evade detection through their trading strategies, whether by exploiting less transparent market conditions or by capitalizing on gaps in regulatory oversight, can potentially generate higher returns than is typically observed. These trades may not be captured in publicly available data. As a result, the sample of insider trading cases we observe may be skewed, with particularly profitable cases going unreported, thereby leading to a partial view of the overall profitability of insider trading in practice.

This highlights the importance of considering both the observable and unobservable factors that may influence insider trading returns, as the high profitability of certain cases may remain hidden, distorting the broader conclusions we can draw from visible, documented instances of insider trading. Further research, including more robust detection methods or comprehensive data, would be essential to fully understand the extent of these "missed" cases and their potential impact on the overall profitability of insider trading.

To estimate the expected insider trading return $F(X',\ \varepsilon')$, we modify the form of the function $F(X',\ \varepsilon')$ by introducing the determining factors of asset pricing estimation according to the efficient market hypothesis. Based on the model of Li and Luo (2016), we construct a probit model with 4 variables including company size (*lnME*), book-to-market ratio (*lnBE/ME*), accumulated profit (*MOM*), and turnover rate (*TURNOVER*) to explain the probability that the amount of illegal income in cases of insider trading, ranks in the top 30 % among all cases $Prob\ (S_{profit} = 1)$. Similarly, the empirical model of model (9) is written as follows:

$$Prob\ (S_{profit} = 1) = a + b_1 lnME + b_2 lnBE/ME + b_3 MOM + b_4 TURNOVER. \tag{12}$$

Adding the IMRs calculated with estimations from model (11) and model (12) as the control variable mitigates the two potential types of sampling bias. The model, after correction for potential sampling bias, is shown in model (13):

$$BHAR_{i,j,t} = \alpha_0 + \alpha_1 LAW_{i,j,t} + a_2 Firm\ Characteristics_{i,j,t} + \rho\sigma IMR_{i,j,t} + Ind_{i,j,t} + Year_t + \varepsilon_{i,j,t} \tag{13}$$

Specifically, the requirement for identifying sampling bias in model (12) is that the excludability constraint must be satisfied when estimating $X'$. That is, $X'$ is assumed to have no direct influence on $Sy$ and can only impose an indirect influence through *IMR*. This requirement can be satisfied by the underlying logic of this model. The primary variable of attention $y$ is excess insider trading return whose determining factors should not be public fundamental information such as company size, growth, and accumulated profit but the impact of insider information itself on the expected return of assets. In terms of our variables in the first-stage regression $X'$, we examine the variables ln*ME,*

ln*BE/ME*, and *MOM* to assess their predictability of Return on Assets (ROA) for Chinese listed companies. Consistent with Liu et al. (2019), we find that the correlations between these variables and ROA are low, with none exceeding 0.05. This suggests that the relationship between these variables and ROA is statistically and economically insignificant, supporting the assumption that there is no significant direct correlation between them.

We can now employ Heckman's two-step method to correct any potential sampling biases in the data. The results presented in Table 7 confirm that after accounting for these biases, the impact of the rule of law on excess insider trading returns remains significant. This finding shows that even after accounting for selection biases and ensuring model accuracy, the rule of law significantly influences insider trading profitability in China's capital markets. This approach addresses sample selection bias and strengthens the conclusion that differences in the legal environment are a key factor in determining illegal insider trading returns.

#### 4.3.2. Alternate dependent variable

To further assess the impact of legal environment differences on insider trading returns, we calculate the basis rate of return using the highest prices during the period when insider traders bought or sold stocks. This allows for the re-estimation of the excess insider trading return while controlling for the potential influence of insiders' market timing ability. By isolating the effect of market timing, we can determine whether insiders are outperforming the market solely through their timing skills or if other factors, such as access to non-public information, contribute to their higher returns.

This additional analysis provides further evidence of the role that legal environment differences play in determining insider trading profitability. If the excess insider trading return remains significantly higher even after accounting for the basic rate of return, it strengthens the argument that legal environment differences are crucial in influencing insider trading outcomes. On the other hand, if the excess return is not significantly different from the basic rate of return, it would suggest that market timing ability is the primary factor behind insiders' higher returns, rather than the legal environment. The results, presented in Table 8, confirm the earlier findings, showing that the rule of law is significantly and positively correlated with excess insider trading returns. This suggests that, beyond market timing, insiders operating in regions with a stronger legal environment earn higher returns from their trades, due to the increased risks from enhanced enforcement and greater regulatory scrutiny in these areas.

#### 4.3.3. Alternate proxy of key independent variables

To address concerns about potential bias from accidental correlation that could arise if continuous variables are used directly in a regression, we follow Wang et al. (2019) and transform the continuous indices of legal environment differences into dummy variables. Specifically, we assign a value of 1 to provinces where the legal environment index is higher than the national average, and zero to those below the average. These dummy variables are then incorporated into the regression model. The use of dummy variables simplifies the interpretation of the regression results, as the coefficients of these variables represent the average differences in insider trading returns between provinces with a stronger legal environment (above the average) and those with a weaker legal environment (below the average). The results presented in Table 9 are consistent with our previous findings. Specifically, excess insider trading returns in provinces where the rule of law is higher than the national average are significantly higher compared to those in provinces with weaker legal environments. Furthermore, the risk of company violations emerges as a mediating factor in this relationship, and reinforces the idea that insiders receive higher trading returns in provinces with stronger legal frameworks, due to their need to offset the risks from increased enforcement and regulatory scrutiny in those regions.

**Table 7**
Insider trading excess return and legal environment: Heckman's two-stage method.

| | Dependent variable: *BHAR* | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Panel A. Controlling for sampling bias based on adjustment for detection of insider trading | | | |
| $LAW^{Institution}$ | 0.011*** | | |
| | (0.003) | | |
| $LAW^{Environment}$ | | 0.013*** | |
| | | (0.003) | |
| $LAW^{Resources}$ | | | 0.008** |
| | | | (0.003) |
| Firm Characteristics | Yes | Yes | Yes |
| Industry Effect | Yes | Yes | Yes |
| Year Effect | Yes | Yes | Yes |
| Constant | −5.466 | −5.606 | −5.214 |
| | (4.857) | (4.790) | (4.971) |
| IMR | 6.043 | 6.218 | 5.786 |
| | (6.291) | (6.213) | (6.485) |
| *N* | 478 | 478 | 491 |
| Panel B. Controlling for sampling bias based on adjustment for illegal insider trading gains | | | |
| $LAW^{Institution}$ | 0.011*** | | |
| | (0.003) | | |
| $LAW^{Environment}$ | | 0.012*** | |
| | | (0.003) | |
| $LAW^{Resources}$ | | | 0.004 |
| | | | (0.004) |
| Firm Characteristics | Yes | Yes | Yes |
| Industry Effect | Yes | Yes | Yes |
| Year Effect | Yes | Yes | Yes |
| Constant | −0.902 | −0.856 | −1.656 |
| | (0.995) | (1.215) | (1.140) |
| IMR | −0.096 | −0.076 | −0.617 |
| | (0.425) | (0.667) | (0.936) |
| *N* | 478 | 478 | 491 |

*Note*: This table presents the regression results on the impact of provincial legal environment development on excess insider trading returns, estimated using the Heckman (1979) two-step sample selection model. Variable definitions are provided in Table 1. All regressions include industry and year fixed effects, which are not reported. Standard errors, shown in parentheses, are adjusted for clustering at both the firm and year levels. Statistical significance at the 1 %, 5 %, and 10 % levels is denoted by ***, **, and *, respectively.

**Table 8**
Robustness test: alternative dependent variable.

| | Dependent variable: $BHAR_{high}$ | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| $LAW^{Institution}$ | 0.013*** | | |
| | (0.003) | | |
| $LAW^{Environment}$ | | 0.015*** | |
| | | (0.003) | |
| $LAW^{Resources}$ | | | 0.010*** |
| | | | (0.003) |
| Firm Characteristics | Yes | Yes | Yes |
| Industry Effect | Yes | Yes | Yes |
| Year Effect | Yes | Yes | Yes |
| Constant | −0.826* | −0.829* | −0.906** |
| | (0.492) | (0.491) | (0.458) |
| Adj. *R* | 0.223 | 0.230 | 0.195 |
| N | 478 | 478 | 491 |

*Note*: This table presents the regression results on the impact of provincial legal environment development on excess insider trading returns, using an alternative proxy for excess returns calculated based on the highest price on the insider trading date. Variable definitions are provided in Table 1. All regressions include industry and year fixed effects, which are not reported. Standard errors, shown in parentheses, are adjusted for clustering at both the firm and year levels. Statistical significance at the 1 %, 5 %, and 10 % levels is denoted by ***, **, and *, respectively.

## 5. Additional analysis

### 5.1. Heterogeneity analysis

To generalize the research findings, we now determine if the relationship between the legal environment and insider trading returns remains consistent across different provinces or regions in China. By conducting this analysis, we can assess whether factors such as regional differences in enforcement practices, proximity to the central regulatory authority, or variations in legal resources influence the profitability of insider trading in different areas, providing a more nuanced understanding of how the local legal environment shapes insider trading behavior.

In China, the practices of local judicial authorities are often influenced by the central judicial authority (Ding, 2015; Zhou et al., 2021). Thus, it is important to examine the potential impact of proximity to the central judicial authority on the practices and outcomes of insider trading investigations and adjudication. For instance, the adjudication criteria of regulatory authorities in the Beijing-Tianjin-Hebei region, which is close to the CSRC, differ significantly from those in other regions. This geographical variation in regulatory practices could influence the findings in our study. To test this, we group insider trading cases according to their proximity to the CSRC: “near” for cases in the Beijing-Tianjin-Hebei region and “far” for cases occurring in other provinces. This additional test will help assess whether proximity to the central regulatory authority influences the profitability of insider trading and the effectiveness of local enforcement practices.

Based on model (4), the regression results for the grouped samples displayed in Table 10 show that excess insider trading return is influenced by top-level law-enforcing and regulating authorities. Insider trading that occurs closer to the political center has a greater impact on its profitability. Depending on the measure used for the legal environment, the difference can be as large as ten times (see columns (5) and (6)) or 38 times larger (see columns (1) and (2) or (3) and (4), respectively). This heterogeneity aligns with the findings of Chen and Liu (2022), who show that the closer an insider trading case is to Beijing, the stricter the capital market inspection becomes, leading to a more significant relationship between an insider trader's expected return and the local legal environment.

Local judicial departments in China may prioritize the investigation and punishment of serious cases of law and regulation violations, in line with the broader principle of upholding the rule of law and ensuring accountability for illegal activities. In the context of insider trading and other financial misconduct, relative enforcement priorities are crucial for maintaining market integrity and investor confidence. The publication of "guiding cases" by judicial departments serves as an important mechanism for sharing new approaches and perspectives on case handling, providing valuable guidance and standardization for law enforcement agencies across the country. When a major case in the capital market is investigated and handled in a specific province, it often gains heightened attention from both local and central authorities. This increased attention can lead to a strengthening of local law enforcement efforts, particularly in areas directly relevant to the case, thereby reinforcing the legal framework and fostering a more transparent and stable market environment.

With improved law enforcement and greater scrutiny from authorities, the likelihood of uncovering and exposing insider trading activities in the local capital market should increase. Heightened vigilance and additional resources dedicated to addressing financial misconduct act as a deterrent, making insider traders more cautious since it should increase the chances of detection and prosecution. Focusing on major cases and using them as guiding examples may help create a more robust legal environment, thereby contributing to a reduction in insider trading and other forms of financial malpractice. Additionally, this approach demonstrates the commitment of Chinese authorities to enforcing laws and regulations, thus maintaining the integrity of the financial system.

To test this notion, we use public information to determine whether, in the same year when an informed person bought securities through insider trading, the prefecture-level city where these securities were registered had other publicly penalized cases. This additional analysis should provide valuable insights into the relationship between major case investigations and the local legal environment's impact on insider trading activities. By examining the correlation between the occurrence of other penalized cases and insider trading, we can better understand the role of legal enforcement in shaping insider behavior and market dynamics.

If analysis shows that the prefecture-level city with insider trading cases had a significant number of other publicly penalized cases in the same year, it should support the conclusion that local authorities were actively investigating and addressing serious cases of law and regulation violations. This would be consistent with a strengthening of the legal environment in the city and increasing the likelihood of insider trading activities being exposed. The heightened legal scrutiny could also serve as a deterrent for potential insiders, influencing their trading behavior and return expectations.

Alternatively, if there were few or no publicly penalized cases in the same year in the city where insider trading occurred, it may indicate that the local legal environment was not particularly focused on investigating major cases, or that other factors were influencing the legal landscape. This could suggest a weaker deterrent effect from law enforcement, which may affect insiders' decision-making and the returns they expect from illegal trading.

To investigate this issue, the insider trading samples were classified into two groups. According to model (4), the regression results for the grouped samples are displayed in Appendix A2. When other types of capital market public punishments occur in the same year, informed traders become more sensitive to their local legal environment. If local law enforcement is strict, insiders are likely to require higher trading returns. The results in Appendix A2 support this idea, showing that insiders require higher returns under these conditions. During periods when legal investigations are ongoing, as seen in columns (1), (3), and (5), the premium is positively significant. However, at other times, the premium is less stable and even turns negative.

The event study conducted by Ferreira (1995) showed that the excess return from insider trading is stable at 2 % in both bull and bear markets in the U.S., a finding suggesting that insiders' decisions to commit illegal acts are not significantly influenced by market movements. In other words, the profitability of insider trading remains consistent, regardless

**Table 9**
Robustness test: alternative independent variables.

| | Dependent variable: *BHAR* | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| $D\_LAW^{Institution}$ | 0.078*** | | |
| | (0.022) | | |
| $D\_LAW^{Environment}$ | | 0.107*** | |
| | | (0.022) | |
| $D\_LAW^{Resources}$ | | | 0.064*** |
| | | | (0.024) |
| Firm Characteristics | Yes | Yes | Yes |
| Industry Effect | Yes | Yes | Yes |
| Year Effect | Yes | Yes | Yes |
| Constant | −0.654 | −0.581 | −0.767* |
| | (0.472) | (0.465) | (0.439) |
| Adj. *R* | 0.185 | 0.201 | 0.194 |
| N | 478 | 478 | 491 |

*Note:* This table presents the regression results on the impact of provincial legal environment development on excess insider trading returns, using dummy variables to replace the independent variables. Definitions of the variables are provided in Table 1. All regressions include industry and year fixed effects, which are not reported. Standard errors, shown in parentheses, are adjusted for clustering at both the firm and year levels. Statistical significance at the 1 %, 5 %, and 10 % levels is denoted by ***, **, and *, respectively.

**Table 10**
Heterogeneity analysis: geographic distance from the CSRC.

| | Dependent variable: BHAR | | | | | |
|---|---|---|---|---|---|---|
| | Near (1) | Far (2) | Near (3) | Far (4) | Near (5) | Far (6) |
| $LAW^{Institution}$ | 0.483*** | 0.011*** | | | | |
| | (0.042) | (0.003) | | | | |
| $LAW^{Environment}$ | | | 0.483*** | 0.012*** | | |
| | | | (0.042) | (0.003) | | |
| $LAW^{Resources}$ | | | | | 0.047*** | 0.004 |
| | | | | | (0.012) | (0.004) |
| Firm Characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry Effect | Yes | Yes | Yes | Yes | Yes | Yes |
| Year Effect | Yes | Yes | Yes | Yes | Yes | Yes |
| Constant | −157.367*** | −0.814* | −157.367*** | −0.821* | 3.078*** | −0.537 |
| | (15.425) | (0.481) | (15.425) | (0.480) | (0.697) | (0.447) |
| Adj. $R$ | 0.975 | 0.206 | 0.975 | 0.212 | 0.774 | 0.204 |
| N | 26 | 452 | 26 | 452 | 31 | 460 |

*Note:* This table presents the regression results on the impact of provincial legal environment development on excess insider trading returns, with the sample divided into two subsamples based on the distance from the listed company's headquarters to the seat of the CSRC (Beijing). Definitions of the variables are provided in Table 1. All regressions include industry and year fixed effects, which are not reported. Standard errors, shown in parentheses, are adjusted for clustering at both the firm and year levels. Statistical significance at the 1 %, 5 %, and 10 % levels is denoted by ***, **, and *, respectively. The very high adjusted $R^2$ values in the 'Near CSRC' subsample reflect the small sample size combined with industry and year fixed effects and should be interpreted with caution.

of whether the market is experiencing a bullish (rising) or bearish (falling) trend. This finding is significant because it implies that insiders may have access to non-public information that allows them to make profitable trades irrespective of the overall market direction. It also suggests that the potential risks associated with insider trading, such as legal consequences, may not deter insiders from engaging in such activities.

However, the stability of excess returns in both market conditions could also be attributed to other factors, such as the efficacy of insider trading strategies or the level of sophistication of insiders. Therefore, further research is needed to explore the underlying reasons for any stability in excess return in both bull and bear markets, and to better understand the motivations and decision-making processes of insiders under different market conditions.

To investigate this issue, we divide the sample period into bull and bear markets and re-run our benchmark estimation under different market conditions. The results, reported in Table 11, show a strong premium during bearish market conditions, while the premium is much weaker in bull markets. The only exception occurs when legal enforcement is proxied by $LAW^{Resources}$, where the premium is stronger in bull markets. The inconsistency in using Gao's legal resource proxy may also be due to the sensitivity of our sampling period, since Gao et al. (2016) include a different sampling method.

The results from Table 11, which highlight the distinction in insiders' profits between bull and bear markets, align with existing literature on insider trading behavior in emerging markets.[11] In markets where short selling is restricted or banned, investors are limited to only taking long positions, meaning they can only profit from a rising market (bull market) by buying and selling at higher prices. In such cases, insiders may have a stronger incentive and greater economic benefit to engage in insider trading during bear market conditions. During bear markets, when stock prices decline, it is difficult for investors to profit from traditional long positions, regardless of portfolio construction. However, insiders with access to non-public information may identify stocks that are likely to decline, allowing them to avoid or minimize losses on existing portfolios.

### 5.2. Alternative channels: M&A rumors

We now examine whether the following alternative channels explain insider trading returns in China's capital market: market rumors, financial literacy, political connections, and corporate governance.

Initially, investors' expectations of return may be derived from the information they possess. Therefore, the quality and authenticity of this information play a crucial role in shaping their expected return. Zhou and Sadeghi (2019) find that, in the market pricing of IPOs, institutional investors may overreact to rumors circulating in the market, which can increase the level of investors' expected return. To examine whether rumors influence insider trading returns, we follow and match M&A data of Chinese listed companies, retrieved from Bloomberg, with specific insider information mentioned in the legal documents of the target insider trading cases. We then construct dummy variables to distinguish whether an insider trading case is linked to the authenticity of M&A information. A dummy variable of one is assigned to insider trading cases where the M&A information used matches actual M&A deals in Bloomberg's database, while a dummy variable of zero is assigned to other M&A and insider trading cases, such as those driven by rumors.

The results of this regression, which accounts for the authenticity of M&A information and are reported in Columns (1) to (4) in Appendix A3, provide no supporting evidence. Although insider trading based on real M&A information may generate higher excess returns, including other variables, such as the legal environment, reveals no direct evidence that the authenticity and accuracy of M&A information influence insider trading returns.

### 5.3. Alternative channels: the financial literacy of insider traders

The level of financial literacy can significantly impact investors' stock selection and market timing decisions (C. Jiang et al., 2021). Financial literacy refers to the knowledge and understanding of financial concepts and instruments, and it plays a crucial role in shaping individuals' investment behavior. In the context of insider trading, informed insiders who have access to non-public material information about the company may leverage their financial knowledge to make more informed and strategic trading decisions. Their superior financial knowledge and understanding of market dynamics may enable them to identify profitable trading opportunities more accurately, both in terms of stock selection and market timing.

We therefore identified the financial qualification characteristics of insider traders from the relevant legal documents, defining those who work in the financial industry or finance-related positions as having high financial literacy and assigning them a dummy value of one. All other investors are assigned a value of zero. This approach enables us to

[11] See the references and discussion in for example Tao and Yu (2021).

**Table 11**
Heterogeneity analysis: illegal insider trading in bull and bear market.

| | Dependent variable: *BHAR* | | | | | |
|---|---|---|---|---|---|---|
| | (1) Bear | (2) Bull | (3) Bear | (4) Bull | (5) Bear | (6) Bull |
| $LAW^{Institution}$ | 0.0252*** | 0.00609 | | | | |
| | (0.006) | (0.004) | | | | |
| $LAW^{Environment}$ | | | 0.0245*** | 0.00698* | | |
| | | | (0.005) | (0.004) | | |
| $LAW^{Resources}$ | | | | | 0.00607 | 0.0160*** |
| | | | | | (0.007) | (0.005) |
| Firm Characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry Effect | Yes | Yes | Yes | Yes | Yes | Yes |
| Year Effect | Yes | Yes | Yes | Yes | Yes | Yes |
| Constant | −0.770 | −0.691 | −0.719 | −0.685 | −0.395 | −1.224** |
| | (−0.819) | (−0.566) | (−0.866) | (−0.571) | (−0.806) | (−0.544) |
| Adj. $R^2$ | 0.280 | 0.229 | 0.286 | 0.232 | 0.287 | 0.239 |
| *N* | 162 | 303 | 162 | 303 | 187 | 304 |

*Note:* This table presents the regression results on the impact of provincial legal environment development on excess insider trading returns, with the sample divided into two subsamples based on whether the stock market is in a bear or bull market. Definitions of the variables are provided in Table 1. All regressions include industry and year fixed effects, which are not reported. Standard errors, shown in parentheses, are adjusted for clustering at both the firm and year levels. Statistical significance at the 1 %, 5 %, and 10 % levels is denoted by ***, **, and *, respectively.

determine whether these differences in financial literacy influence investors' excess insider trading returns.

As shown in columns (5) to (8) in Appendix A3, there is no direct evidence that financial literacy levels influence insider trading returns, or that financial sector professionals charged with insider-trading can receive higher returns than non-professionals. One simple explanation is that the insider traders are opportunistic and simply trading stocks does not require sophisticated financial market experience. Another explanation is that the influence of financial literacy on asset returns may not be linear (Yin et al., 2019). Thus, using dummy variables may fail to capture the complex connection between financial literacy and asset returns. Furthermore, finds that the characteristics of those with insider information, such as the number of informed individuals and their titles, are also insignificant in predicting excess insider trading returns. This result notably differs from Ahern's (2017) findings regarding the characteristics of informed traders. As more data on insider trading cases become available, further analysis may shed additional light on this puzzle in the future.

### 5.4. Alternative channels: political connection

Insiders are also more likely to access private information through their networks with politicians (Bourveau et al., 2021). Ties between a company's top managers and politicians or regulators can encourage insider opportunism, thereby motivating informative trading (Jagolinzer et al., 2020). Additionally, ruling and opposition parties may hold differing perspectives on regulating insider trading (Kacperczyk and Pagnotta, 2024). Political ties may potentially benefit insiders in stock markets commonly perceived as having a weak rule of law. To test this mechanism, we obtained the political backgrounds of the CEO and board chair of the target company from the CSMAR database.

We then set the dummy variable $PC_1$ to equal one if either the CEO or board chairperson works, or previously worked, for the government, and zero otherwise. We also set an ordered variable $PC_2$ ranging from 0–4, where the higher the value of $PC_2$, the higher the position of the politically connected CEO in China's political hierarchy.

Interestingly, the results in Appendix A4 do not support the view that political connection is a significant factor in yielding higher returns for insiders. The proxy for political connection, regardless of how it is defined, remains statistically insignificant across all six columns. To better understand why political connections are irrelevant in determining illegal insider profits, we carefully reviewed all legal documents and found that most insiders held junior or mid-level positions in the target company or in an asset management company. The political connections of these insiders were much weaker than those of the company's top managers, making it unlikely that their illegal gains were driven by information from political sources.

### 5.5. Alternative channels: corporate governance

Since La Porta et al. (1998), the relationship between the legal environment and corporate governance has been a central area of research, with numerous studies documenting a positive association between improvements in legal institutions and the development of corporate governance (e.g., Kim and Skinner, 2012; Morganti and Garofalo, 2019; Kim et al., 2019). However, in contrast to research on the U. S. and other developed economies, corporate governance may complement the legal environment in emerging markets such as China (Huang et al., 2012; Mazza and Wang, 2021; Sun et al., 2021) and other economies (Ojah et al., 2020). Furthermore, studies such as Miller et al. (2008) suggest that, in emerging economies, the quality of corporate governance may have greater importance than legal or other institutional regulations. This implies that the relationship we observe between the legal environment and illegal insider returns may be influenced by the company's corporate governance status.

To test whether our results are subject to this alternative explanation, we incorporate several corporate governance proxies into the benchmark regression, as shown in model (4), and observe any changes in the coefficient on the legal environment. We use (a) the governance score from the Chindices ESG database, (b) managerial ownership, (c) CEO duality, and (d) the G-index—measures frequently cited in the relevant literature (e.g., Alexander and Cumming, 2020; Dai et al., 2016; Karpoff et al., 2008). The results, presented in Table 12, indicate that corporate governance is an independent factor in predicting illegal insider returns. However, this factor does not replace the role of the legal environment, as previously documented. This finding aligns with Dai et al. (2016), among others, who found that the quality of corporate governance has an insignificant effect on insider profitability in China. This suggests that the illegal returns from a buy-and-hold strategy are unlikely to be affected by the company's level of corporate governance. We conclude that the predictive power of the legal environment on illegal insider returns is at least independent of the company's corporate governance.

## 6. Conclusion

This paper examines how variation in provincial legal environments in China affects the risk premium associated with illegal insider trading. Using 521 hand-collected court judgments from adjudicated insider-

**Table 12**
Legal environment, corporate governance, and excess insider trading return.

| | Dependent Variable: *BHAR* | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ESG Governance | | | Managerial Ownership | | | CEO Duality | | | G-index | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| $LAW^{Institution}$ | 0.011*** | | | 0.008** | | | 0.012*** | | | 0.087*** | | |
| | (0.039) | | | (0.004) | | | (0.003) | | | (0.023) | | |
| $LAW^{Environment}$ | | 0.012*** | | | 0.008** | | | 0.012*** | | | 0.080*** | |
| | | (0.029) | | | (0.004) | | | (0.003) | | | (0.023) | |
| $LAW^{Resources}$ | | | 0.007** | | | 0.007* | | | 0.010*** | | | 0.005 |
| | | | (0.002) | | | (0.004) | | | (0.004) | | | (0.048) |
| *Corporate Governance* | −0.062** | −0.071*** | 0.005 | −0.108 | −0.214 | −0.120*** | −0.042 | −0.084* | −0.015 | 0.008*** | 0.007** | −0.001 |
| | (−0.027) | (−0.027) | (0.015) | (−0.174) | (−0.189) | (0.037) | (−0.046) | (−1.864 | (−0.026) | (0.003) | (0.003) | (−0.002) |
| Firm Characteristics | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry Effect | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year Effect | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Constant | −0.517 | −0.401 | −0.734 | −0.658 | −0.509 | −0.871** | −0.512 | −0.472 | −0.721 | −1.386** | −1.229** | −0.770 |
| | (−0.434) | (−0.427) | (−0.459) | (−0.416) | (0.410) | (−0.421) | (−1.24) | (−0.413) | (−0.440) | (−0.541) | (−0.502) | (−0.513) |
| Adj. $R^2$ | 0.191 | 0.200 | 0.185 | 0.200 | 0.209 | 0.208 | 0.192 | 0.199 | 0.190 | 0.195 | 0.198 | 0.156 |
| N | 468 | 468 | 480 | 468 | 468 | 480 | 468 | 468 | 480 | 447 | 447 | 435 |

*Note:* This table presents the regression results for an alternative explanation of excess insider trading returns: corporate governance. Definitions of the variables are provided in Table 1. All regressions include industry and year fixed effects, which are not reported. Standard errors, shown in parentheses, are adjusted for clustering at both the firm and year levels. Statistical significance at the 1 %, 5 %, and 10 % levels is denoted by ***, **, and *, respectively.

trading cases between 2006 and 2018, we estimate holding-period returns and analyze whether legal risk is factored in the profitability of trades that insiders choose to execute. Our approach adds to the legal-institution and financial-misconduct literature (La Porta et al., 1998; Allen et al., 2019; Hu et al., 2021).

The results show that provincial legal quality plays a decisive role in shaping insider-trading outcomes. Insiders weigh expected gains against enforcement risk and trade only when the anticipated return exceeds the expected penalty, a pattern consistent with the rational-crime model (Becker, 1968). This behavior produces higher conditional profitability in jurisdictions with stricter legal environments, as only high-return trades survive deterrence. Firm-level litigation exposure further strengthens this relationship, in line with evidence that firm-level legal characteristics shape misconduct incentives (Miller et al., 2008; Chen et al., 2017; Sun et al., 2021). These findings are robust to selection-correction procedures, alternative measures of returns and legal risk, and a range of institutional heterogeneity tests.

The evidence demonstrates that legal risk is priced in illegal insider trades and highlights how differences in enforcement capacity affect misconduct incentives in emerging markets (Bosio et al., 2022). We document that judicial characteristics, such as investor-protection strength and legal-process efficiency, are closely linked to excess trading returns, indicating that the probability of detection is an important determinant of insider profitability. We also examine potential channels by analyzing the likelihood of regulatory detection, showing that higher expected enforcement costs at the company level meaningfully influence insiders' decisions.

Further tests show that a stronger legal environment corresponds to higher firm-level legal risk and, in turn, higher excess returns on insider trades. We rule out alternative explanations, including M&A rumors and financial-literacy effects. Insiders with superior financial knowledge do not earn higher abnormal returns, nor does publicly traceable information on M&A activity materially influence observed profitability.

The study also provides several implications for strengthening insider-trading enforcement. Although China's regulatory framework has improved, limited enforcement resources can weaken deterrence and leave profitable opportunities for insiders (He et al., 2021). Establishing specialized courts and standardizing evidentiary criteria could improve consistency across provinces (Mazza and Wang, 2021). Given the complexity of insider-trading networks and information channels, regulators may also benefit from expanding monitoring tools and using advanced data-analytics systems to detect suspicious activity (Gong et al., 2021), especially in markets where digital trading records are available.[12]

Educational initiatives may further reduce misconduct by raising awareness of legal risks and sanctions. Strengthening transparency, disclosure standards and corporate-governance practices can support market integrity and discourage insider trading (Beltratti et al., 2016). Ultimately, sustained efforts to enhance the legal environment, increase detection capabilities and elevate investor knowledge are essential for developing fair and transparent capital markets that protect investors and maintain confidence.

## CRediT authorship contribution statement

**Jonathan A. Batten:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Conceptualization. **Lanlan Liu:** Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Resources, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Yezhou Sha:** Writing – review & editing, Writing – original draft, Visualization,

[12] More specific examples of possible regulatory initiatives include (a) Prioritize ex ante enforcement by focusing on early detection and surveillance. Although Article 180 of the Criminal Law of the People's Republic of China and the amended Securities Law (2020) strengthen penalties for insider trading, enhancing surveillance infrastructure could further increase the perceived likelihood of detection, which research shows has a stronger deterrent effect than harsher penalties alone (Becker, 1968; Dyck et al., 2010). (b) Adopt regulatory risk profiling tools, as used by the SEC's Market Abuse Unit in the United States. These tools help concentrate enforcement efforts on specific firms, industries, and regions (Kim and Skinner, 2012). See for example, https://www.sec.gov/newsroom/press-releases/2022-129). (c) Improve judicial transparency and inter-agency coordination to provide more consistent and equitable justice. Although there have been continuous efforts to clarify insider trading prosecutions through judicial interpretations, enforcement outcomes still vary significantly by province (Huang, 2020). Establishing a centralized enforcement platform could reduce regional disparities in legal interpretation and bolster investor confidence. (d) Leverage recently introduced whistleblower programs and civil liability mechanism. Given the new provisions introduced by the CSRC and judicial authorities on whistleblower programs and civil liability, consider leveraging these mechanisms to strengthen detection and accountability.

Validation, Software, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

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## Appendix

**Appendix Table A1**
Insider trading excess return and legal environment: bootstrap method.

| | Dependent variable: *BHAR* | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| $LAW^{Institution}$ | 0.012*** | | |
| | (0.002) | | |
| $LAW^{Environment}$ | | 0.013*** | |
| | | (0.002) | |
| $LAW^{Resources}$ | | | 0.008*** |
| | | | (0.003) |
| Firm Characteristics | Yes | Yes | Yes |
| Industry Effect | Yes | Yes | Yes |
| Year Effect | Yes | Yes | Yes |
| Constant | −0.668* | −0.662 | −0.731 |
| | (0.404) | (0.414) | (0.557) |
| Adj. *R* | 0.200 | 0.207 | 0.191 |
| N | 478 | 478 | 491 |

Note: This table presents regression results on the impact of provincial legal environment development on excess insider trading returns, employing the bootstrap method to expand the small sample through random simulation. Variable definitions are provided in Table 1. All regressions include industry and year fixed effects, which are not reported. Standard errors, shown in parentheses, are adjusted for clustering at both the firm and year levels. Statistical significance at the 1 %, 5 %, and 10 % levels is denoted by ***, **, and *, respectively.

**Appendix Table A2**
Heterogeneity analysis: spillover effects.

| | Dependent variable: *BHAR* | | | | | |
|---|---|---|---|---|---|---|
| | Yes | No | Yes | No | Yes | No |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $LAW^{Institution}$ | 0.011*** | 0.023 | | | | |
| | (0.003) | (0.024) | | | | |
| $LAW^{Environment}$ | | | 0.013*** | 0.029 | | |
| | | | (0.003) | (0.034) | | |
| $LAW^{Resources}$ | | | | | 0.008** | −0.189** |
| | | | | | (0.003) | (0.033) |
| Firm Characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry Effect | Yes | Yes | Yes | Yes | Yes | Yes |
| Year Effect | Yes | Yes | Yes | Yes | Yes | Yes |
| Constant | −0.365 | −2.042 | −0.400 | −1.787 | −0.492 | 9.062** |
| | (0.438) | (4.627) | (0.436) | (5.168) | (0.490) | (2.008) |
| Adj. *R* | 0.196 | 0.323 | 0.203 | 0.286 | 0.188 | 0.910 |
| N | 447 | 31 | 447 | 31 | 461 | 30 |

*Note:* This table presents the regression results on the impact of provincial legal environment development on excess insider trading returns, with the sample divided into two subsamples based on the presence of other insider trading cases detected in the same province within the same year. Definitions of the variables are provided in Table 1. All regressions include industry and year fixed effects, which are not reported. Standard errors, shown in parentheses, are adjusted for clustering at both the firm and year levels. Statistical significance at the 1 %, 5 %, and 10 % levels is denoted by ***, **, and *, respectively.

**Appendix Table A3**
M&A rumors, financial literacy, and excess insider trading return.

| | Dependent variable: *BHAR* | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Panel A: M&A rumors channel | | | | Panel B: Financial literacy channel | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| *DRINFO* | 0.022 | 0.045 | 0.046 | 0.037 | | | | |
| | (0.024) | (0.029) | (0.028) | (0.027) | | | | |
| *DFINANCE* | | | | | −0.039 | −0.032 | −0.030 | −0.046 |
| | | | | | (0.040) | (0.046) | (0.046) | (0.043) |
| $LAW^{Institution}$ | | 0.011*** | | | | 0.012*** | | |
| | | (0.003) | | | | (0.003) | | |
| $LAW^{Environment}$ | | | 0.013*** | | | | 0.013*** | |
| | | | (0.003) | | | | (0.003) | |
| $LAW^{Resources}$ | | | | 0.007** | | | | 0.008** |
| | | | | (0.003) | | | | (0.003) |
| Firm Characteristics | No | Yes | Yes | Yes | No | Yes | Yes | Yes |
| Industry Effect | No | Yes | Yes | Yes | No | Yes | Yes | Yes |
| Year Effect | No | Yes | Yes | Yes | No | Yes | Yes | Yes |
| Constant | −0.112*** | −0.818* | −0.763* | −0.742* | −0.104*** | −0.649 | −0.650 | −0.639 |
| | (0.012) | (0.424) | (0.425) | (0.436) | (0.011) | (0.432) | (0.431) | (0.446) |
| Adj. $R^2$ | −0.001 | 0.203 | 0.210 | 0.193 | 0.001 | 0.200 | 0.207 | 0.193 |
| N | 521 | 478 | 478 | 491 | 521 | 478 | 478 | 491 |

*Note:* This table presents the regression results for two alternative explanations of excess insider trading returns: the M&A rumor channel (Panel A) and the financial literacy channel (Panel B). Definitions of the variables are provided in Table 1. All regressions include industry and year fixed effects, which are not reported. Standard errors, shown in parentheses, are adjusted for clustering at both the firm and year levels. Statistical significance at the 1 %, 5 %, and 10 % levels is denoted by ***, **, and *, respectively.

**Appendix Table 4**
Political connection and excess insider trading return.

| | Dependent variable: *BHAR* | | | | | |
|---|---|---|---|---|---|---|
| | If insider is politically connected | | | Level of political connection | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $LAW^{Institution}$ | 0.012*** | | | 0.012*** | | |
| | (0.003) | | | (0.003) | | |
| $LAW^{Environment}$ | | 0.012*** | | | 0.012*** | |
| | | (0.003) | | | (0.003) | |
| $LAW^{Resources}$ | | | 0.011*** | | | 0.011*** |
| | | | (0.004) | | | (0.003) |
| *PC* | 0.020 | −0.016 | 0.033 | 0.001 | −0.008 | 0.010 |
| | (0.055) | (−0.053) | (0.027) | (0.018) | (−0.017) | (0.009) |
| Firm Characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| *Industry Effect* | Yes | Yes | Yes | Yes | Yes | Yes |
| *Year Effect* | Yes | Yes | Yes | Yes | Yes | Yes |
| Constant | −0.746 | −0.749 | −0.481 | −0.745 | −0.753* | −0.488 |
| | (0.455) | (−0.456) | (−0.480) | (−0.457) | (−0.456) | (−0.478) |
| Adj. $R^2$ | 0.197 | 0.204 | 0.170 | 0.197 | 0.204 | 0.170 |
| *N* | 478 | 478 | 466 | 478 | 478 | 466 |

*Note:* This table presents the regression results for an alternative explanation of excess insider trading returns: political connection. Definitions of the variables are provided in Table 1. All regressions include industry and year fixed effects, which are not reported. Standard errors, shown in parentheses, are adjusted for clustering at both the firm and year levels. Statistical significance at the 1 %, 5 %, and 10 % levels is denoted by ***, **, and *, respectively.

## Data availability

Data will be made available on request.

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