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Strong Financial Laws Without Strong Enforcement: Is Good Law Always Better than No Law?

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This article examines whether strong laws are effective when regulatory institutions are weak. This has become especially relevant due to criticisms of financial market regulation in the United States. I test the impact of imposing strong laws on a weak regulatory environment by using China's principled reforms to market manipulation law as a natural experiment. The results from difference-in-difference tests suggest that China's principled law reforms did not improve the market's information environment, as proxied by the level of informed trade and information asymmetry. This implies that principled law reform is ineffective if the regulatory environment is weak.

I. Introduction

This article analyzes whether strong law is effective in the presence of weak regulatory institutions. This is a live issue for policysetters as they attempt to reform the financial system to prevent future market misconduct. This has become particularly relevant as the European Union has attempted to reform securities laws under the Markets in Financial Instruments Directive (MiFID) (see Cumming et al. 2011), and the regulation of financial markets in the United States has sustained recent criticism (Coffee & Sale 2009; Fisch 2009; Karmel 2009; Baker 2010). I use a difference-in-difference methodology to disentangle the effects of the design of new laws from their actual implementation and I find that strong law in the presence of weak regulations might actually worsen market conditions. This provides additional empirical support for the prediction in Bhattacharya and Daouk (2009) that "no law" can sometimes be better than "good law." This also suggests that empirical law and finance work should carefully distinguish between the mere presence of laws and their enforcement.

Market manipulation is a key problem in China's securities markets. One key type of market manipulation is manipulation by issuing "false statements" that inflate (or deflate)

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stock prices. A key remedy for such false statements is a shareholder class action.[1] In 2001, their prevalence, and subsequent consumption of court time, induced China's Supreme People's Court (SPC) to refuse to hear market manipulation cases. Subsequently, on January 9, 2003, China's Supreme People's Court promulgated a guideline judgment that made principled legal reforms to compensation for market manipulation. The judgment has equivalent status to legislation. There were no reforms to the regulatory institutions. This problem was amplified because regulatory approval was still necessary in order for shareholders to pursue a class action. Thus, while the law became stronger, it was still difficult for shareholders or regulators to enforce it. The prevalence of market manipulation coupled with the presence of strong law and weak regulation provides a natural experiment in which to test the impact of good law in the absence of good regulation. This enables me to disentangle the effects of regulatory strength and legal strength.[2]

Strong laws can create value. La Porta et al. (1997, 1998) and Spamann (2010) show that rules that protect shareholder rights encourage economic development. Cumming et al. (2011) show that strong stock exchange rules (cf. legal rules) increase market liquidity. Bruno and Claessens (2010) indicate that stringent investor protection can increase corporate value (depending on the quality of the firm's own internal corporate governance). Becher and Frye (2011) find that (in the United States) strong regulation can complement strong corporate governance. The desire for strong legal rules was one motivation for the European Unions's implementation of MiFID and the Takeover Directive (Committee of Wise Men 2001; Prodi 2002; Clarke 2009; McCahery & Vermeulen, 2010).

Strong laws are likely to be ineffective, and might be detrimental, if there is weak regulation. In the context of false disclosures, for example, if there is no law but there is wrongful conduct (i.e., issuing a false statement), then there will be a general state of noncompliance and a general distrust of corporate announcements. In this case, a corporation does not have an especial incentive to release falsely positive statements because it is unlikely that shareholders will place much credibility in them, thereby reducing the advantage gained by trading on private information (because everyone needs to become privately informed). By contrast, if there is a strong law that is not enforced, then some companies will comply with the law, but the noncompliers will deviate even more on the assumption that the compliers raise the general level of credibility of corporate announcements, thereby creating an incentive to issue falsely positive statements. The presence of compliers and (potentially serious) noncompliers raises the incentives for a trader to gather private information. This would increase the presence of informed trade and potentially reduce market quality.

China has strong laws on market manipulation by false statements. The SPC issued a guideline-type judgment on January 9, 2003 vis-à-vis private remedies for market manipulation by false statements. Humphery-Jenner (2011) argues that China's rules on

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[1]The impact, and undesirability, of such conduct has received significant attention in the United States (Cox et al. 2005, 2006, 2008; Fox 2005, 2006; Peng & Röell 2008; Bai et al. 2011; Humphery-Jenner 2011, 2012).

[2]This contrasts with some prior studies that examine the impact of the "first enforcement" of insider trading laws. The issue with examining the first enforcement date is that if regulators are strong, they might deter misconduct and thus a strong law in a strong regulatory environment might actually appear to be underenforced.

false statements are legally justified, containing principled rules on causation, remoteness, and mitigation. China has a poor reputation for securities law enforcement (Chen et al. 2005; Pistor & Xu 2005). China's regulatory regime did not change following the legal change.

This article uses the promulgation of strong false statement regulations on January 9, 2003 as a natural experiment with which to answer the question: Is good law sufficient to improve market behavior in the absence of good regulation?

I examine whether the law reform improved the financial environment by reducing the presence of informed trade, as proxied by the probability of informed trade (PIN), the adverse selection component of the bid-ask spread, the absolute order imbalance, and (in Appendix A) the daily bid-ask spread.[3] This is based on two streams of literature. First, the legal environment can influence market microstructure and trading behavior (Macey & O'Hara 1997; Ciccotello & Hatheway 2000; Mahoney 2003; Daouk et al. 2006). Second, improved disclosure can influence the firm's information environment, as proxied by microstructure measures of information asymmetry and informed trade (following Brown & Hillegeist 2007; Chung et al. 2010), and by the firm's cost of capital (Bhattacharya et al. 2003; Daouk et al. 2006). This implies that a way to test the efficacy of law reform is to test whether it improved the firm's information environment, as proxied by intraday measures of informed trade and information asymmetry.

I test the impact of the SPC's January 9 interpretation by using a difference-in-difference approach. The treatment sample is the set of firms that listed on the Shanghai Stock Exchange or the Shenzhen Stock Exchange. The control sample comprises firms listed on the Hong Kong Stock Exchange, the Taiwan Stock Exchange, or the Korean Stock Exchange (KOSDAQ). I ensure robustness to violations of the parallel trend assumption by using a propensity score radius-matching-type approach and by examining various control sample compositions.

The results show that the SPC's interpretation did not reduce informed trade. Instead, the results suggest that informed trade, as proxied by PIN and the absolute order imbalance, increased following the SPC's interpretation. This implies that absent a strong regulatory framework, good law is not sufficient to improve the economic environment.

These results support prior modeling by clearly disentangling enforcement and law by using a natural experiment. Cumming and Johan (2008) argue in favor of enhanced global market surveillance. Bhattacharya and Daouk (2002) find that the corporate cost of equity does not change after the introduction of insider trading laws, but does decrease after the first prosecution. Chen and Hao (2011) similarly find that enforcement of insider trading laws lowers underwriter gross spreads. Daske et al. (2008) find that legal quality influences the impact of adopting mandatory international financial reporting standards (IFRS), although they examine a sample of relatively developed countries. Bhattacharya and Daouk (2009) predict that if there is no law, then everyone is in a "bad equilibrium." However, if there is good law that is not enforced, then (1) some people will comply and (2)

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[3]These are established measures of informed trade. An increase in the level of informed trade to uninformed trade suggests a less transparent and "fair" market environment (following Aktas et al. 2007).

the people who do not comply will exploit the compliant people and deviate even more. They show a link between liquidity and law enforcement.

This article has a number of differences from prior work that enable it to make an important contribution. First, some prior studies compare (1) the impact of the introduction of insider trading laws with (2) the impact of the "first prosecution" of those laws. The key issue is that the mere lack of prosecutions does not render an environment weak. Instead, a strong regulator can deter misconduct, and this strength might be the reason for a lack of prosecutions. Thus, it is necessary to amplify these existing findings by examining the impact of introducing a strong law into a weak regulatory environment. Second, I directly test the impact of a legal change on measures of market quality, such as PIN, the adverse selection component of the spread, or order imbalance. This provides a direct examination of the impact of legal changes on market quality.[4] Third, I analyze the law in relation to false statements/ "fraud on the market" as opposed to insider trading. Thus, this article uses a difference-in-difference methodology to directly examine the impact of changes in securities fraud laws on market quality. This enables me to reach the overall conclusion that principled law reform might be ineffective (or even counterproductive) in the absence of a strong regulator.

II. The Institutional Background

This section discusses the institutional background. First, I discuss the relevant conduct. Second, I discuss the relevant rules. Third, I discuss the relatively weak regulatory environment at the time.

A. The Conduct

The situation involves market manipulation by issuing false statements. The typical situation is that a company issues a falsely positive statement (or omits negative information) and thereby inflates the stock price. Shareholders who purchase the stock at this inflated price may suffer a loss when the market realizes that the company's statement was false and the price falls. Shareholders may then wish to sue the company for loss suffered due that false statement.[5]

B. The Rules

There are three presently relevant legal rules vis-à-vis false statements. I only describe laws during the relevant period and do not consider current laws. First, Article 63 of the PRC

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[4]Some prior literature has analyzed the impact of laws/enforcement on the firm's cost of capital. However, the firm's cost of capital is an indirect proxy for market quality. Note that Bhattacharya and Daouk (2009) do examine liquidity.

[5]This situation has received significant analysis in the context of the United States (Fox 2005, 2006; Coffee 2006), the United Kingdom (Davies 2009; Ferran 2009), and Australia (Humphery 2009). It has received little legal analysis in China.

Securities Law provides for compensation following false statements. This provides the legal cause of action on which shareholders can lodge litigation. The full text of Article 63 is:

> Article 63: The information as disclosed by issuers and listed companies according to law shall be authentic, accurate and complete and shall not have any false record, misleading statement or major omission.

Article 63 does not per se give shareholders standing to sue and is vague, requiring interpretation by the courts. Article 69 then renders the company liable to pay compensation for loss that investors "thus incur." The standing to sue (at the relevant time) would arguably have come within Article 111 of the PRC Company Law, which states:

> Article 111: Where a resolution adopted by the shareholders' general meeting or the board of directors violates the relevant national statutes or administrative regulations, or infringes the rights and interests of shareholders, a shareholder is entitled to bring a suit to the People's Court to enjoin such illegalities or infringements.

Subsequently, during 2002 and 2003, the laws provided for shareholders to be able to sue; however, these laws required interpretation.

Second, the SPC notionally explicitly allowed lawsuits vis-à-vis false statements on January 15, 2002.[6] This supersedes a judgment in 2001 that the court would not entertain civil litigation for false statements.[7] The reasoning behind the 2001 judgment was that false statement cases were so prolific that the court lacked the resources to consider them all. The 2002 judgment did not interpret the law, indicate when conduct would violate Article 63, or state when a company would be liable under Article 69 of the Securities Law. Thus, while the judgment notionally provided access to lawsuits, it did not provide a principled interpretation of the law that shareholders could use to structure a case.

Third, on January 9, 2003, the Supreme People's Court (SPC) promulgated an interpretation of when a company would be liable to pay compensation for false statements.[8] This was arguably the "first and important step towards the establishment of a civil litigation and compensation system . . . for securities fraud cases" (Zhu 2011:176). The law and the regulatory scheme are interconnected because the SPC stated that shareholders can sue for "false statements" only if the regulator (the China Securities Regulatory Commission (CSRC)) pursues regulatory action (2003 interpretation of Article 6).

The 2003 interpretation implements the legal rules that permit civil compensation for false statements that manipulate market prices. It implicitly or explicitly covers all of (1) the date of the plaintiff's loss, (2) when the false statement causes the loss, (3) when loss is too remote, and (4) the requirement (or lack thereof) to mitigate.

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[6]See The Notice of the Supreme People's Court on Relevant Issues of Filing of Civil Tort Dispute Cases Arising from False Statement on the Securities Market (January 15, 2002).

[7]See The Notice of the Supreme People's Court on Temporarily Refusal of Filing of Securities Related Civil Compensation Cases (September 21, 2001).

[8]See Several Provisions of the Supreme People's Court on Hearing Civil Compensation Cases Arising from False Statement on the Securities Market (promulgated on January 9, 2003, effective from February 1, 2003).

The 2003 interpretation makes principled reforms to China's laws on market manipulation by false statements. At a base level, it grants the (heretofore lacking) ability to sue for damages caused by false statements that manipulate market prices. Further, Humphery-Jenner (2011) argues that the laws are analytically more principled than those in the United States and the United Kingdom. In short, the 2003 interpretation holds that (1) the loss arises on the date the plaintiff purchases the stock, (2) the plaintiff must show that the price is inflated due to the false statement, but need not show that false statement induced the purchase, (3) losses are too remote if they are due to extraneous market movements or are losses on securities that were not the direct subject of the false statement, and (4) there is no duty to mitigate, but if the plaintiff does mitigate the loss, doing so reduces the amount of compensation.

It is not clear that the market did anticipate the 2003 interpretation. This is because the SPC made its guideline judgment outside the context of any publicly announced case. However, anticipation of the law is largely moot from an empirical perspective. (1) If the law is not retroactive, then people would base their behavior on the law that applies at the time of the conduct, not the law that applies after the conduct. In this case, the 2003 interpretation is a clean event in that the anticipation of a law-change at time $t+1$ would not have influenced behavior at time t. (2) If the law is retroactive, then people might change their preinterpretation behavior to reflect the anticipated postinterpretation law.[9] This would make it more difficult to show that the 2003 interpretation influences behavior, making the testing in this article more stringent and thus more persuasive.

C. The Regulatory Environment

The regulatory environment is comparatively weak.[10] Prior literature has criticized the regulatory scheme for being ineffective and for providing inadequate access to remedies (Chen 2003; Chen et al. 2005; Pistor & Xu 2005; Layton 2008). Four measures of sovereign regulation illustrate this: the S&P sovereign risk rating, the International Country Risk Guide (ICRG) composite risk index, a World Bank governance index,[11] and the World Bank's percentile governance rank. Table 1 contains the regulation statistics from 1996–2008. For all variables, a higher value is better, with the World Bank Governance Index and ICRG composite index being out of 1,[12] and the S&P risk rating being out of 20. ICRG states that a country with a rating of 80–100 is very low risk. The statistics show that China's

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[9]It is likely that the 2003 interpretation is retroactive because it comes from a court case and the general rule is that judicial rulings (as opposed to legislation) function retroactively because judges merely interpret law and do not create law.

[10]On the weakness of China's regulatory environment, see generally Steidlmeier (1999), Gong (2002), Jacoby et al. (2002), Pearson (2005), and Pistor and Xu (2005).

[11]This is an equally weighted average of the World Bank percentile ranks for: regulation, rule of law, government accountability, government effectiveness, corruption, and political stability.

[12]Detailed information on the calculation of the ICRG index is available from <http://www.prsgroup.com/ICRG_methodology.aspx> (accessed September 16, 2012).

Table 1: Regulation/Governance Scores for China and the Rest of the World Between 1996 and 2008

	Rest of World				*China*			
Year	*World Bank Governance Index*	*S&P Risk Rating*	*ICRG Composite Risk Rating*	*World Bank Regulation Percentile Rank*	*World Bank Governance Index*	*S&P Risk Rating*	*ICRG Composite Risk Rating*	*World Bank Regulation Percentile Rank*
1996	0.84	17.50	0.81	0.85	0.44	12.00	0.73	0.51
1997	0.84	17.45	0.82	0.85	0.44	12.57	0.74	0.51
1998	0.84	17.18	0.80	0.88	0.38	13.00	0.75	0.40
1999	0.84	17.14	0.78	0.88	0.38	12.38	0.74	0.40
2000	0.84	17.18	0.80	0.88	0.39	12.00	0.73	0.39
2001	0.84	17.23	0.81	0.88	0.39	12.00	0.73	0.39
2002	0.83	17.25	0.80	0.86	0.37	12.00	0.75	0.33
2003	0.83	17.33	0.81	0.86	0.37	12.00	0.77	0.39
2004	0.83	17.45	0.82	0.86	0.38	13.00	0.77	0.45
2005	0.82	17.45	0.81	0.85	0.37	13.89	0.77	0.46
2006	0.82	17.55	0.81	0.86	0.37	14.88	0.78	0.42
2007	0.81	17.48	0.81	0.85	0.37	15.00	0.79	0.46
2008	0.81	17.47	0.80	0.86	0.39	15.97	0.79	0.46

NOTE: I define the "rest of the world" as the set of 47 countries in Table 1 that are not China. Importantly, this excludes some poor-governance emerging markets. The governance scores are the World Bank Governance Index, the S&P sovereign risk rating, the ICRG composite risk rating, and the World Bank percentile rank for regulation.

regulation and governance is lower than that of other countries and this is stable over the whole period. China's ICRG value is consistently below 80, implying that it is marginally below the "very low risk" countries. China's World Bank percentile rank is consistently low, suggesting potentially ineffective regulation during the sample period. Further, the S&P risk rating implies that China is a relatively high-risk country when compared with other countries (i.e., the S&P risk rating is around 5 points, out of 20, below that of other countries during the relevant period of 1999–2002). Similarly, China's World Bank Governance Index is consistently around half that of the rest of the world, implying weak regulation and governance.

The comparatively weak regulatory environment appears to have contributed to a dearth of shareholder class actions. Huang (2012) finds that there were only 50 shareholder derivative actions between January 1, 2006 and December 30, 2010. By contrast, the Stanford Securities Class Action Clearing House suggests that there were 863 "classic" shareholder litigation instances in the United States over this period.[13] This suggests that notwithstanding the potential governance issues in Chinese companies, there has been limited litigation-based discipline.[14] The overall conclusion is that after the 2003 interpretation China has strong law but weak regulation. This implies that the 2003 interpretation provides a natural experiment with which to test whether good law is effective in the absence of good regulation.

III. Methods and Sample

This section contains the methodology, sample, and variables. To foreshadow the discussion, the goal is to examine how informed trade measures changed in China following the 2003 interpretation. I run a difference-in-difference model of the following form:

$$\begin{aligned}\text{Informed Trade}_{it} = \alpha + \text{I(China)}_{it}\beta_1 + \text{I(Treatment)}_{it}\beta_2 + \\ \text{I(China)}_{it} \times \text{I(Treatment)}_{it}\beta_3 + \boldsymbol{X}_{it}\theta + \varepsilon_{it}\end{aligned}$$

where Informed Trade$_{it}$ denotes one of three informed trade measures, I(China)$_{it}$ is an indicator that equals 1 if the firm trades on a Chinese exchange, I(Treatment)$_{it}$ is an indicator that equals 1 if the observation postdates the 2003 interpretation, and $\boldsymbol{X}_{it}$ is a vector of firm-specific controls.

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[13]I obtain these data by searching the Stanford Securities Class Action Clearing House for "classic" litigation instances. Karpoff et al. (2012) suggest that there might be some overreporting in the data set. However, overreporting is unlikely to diminish the indication that there are many more class action cases in the United States than there are in China.

[14]Cumming et al. (2012) find that the CSRC issued "enforcement actions" in relation to 742 cases of "fraud" between 2001 and 2010, but these fraud cases would not all relate to conduct that is relevant to a securities class action under the relevant provisions (only 210 cases relate to a false statement). It is not clear from their data whether these actions were successful, and they indicate that a significant proportion of enforcement actions occur prior to 2004.

The following subsections discuss the details of the model. First, I discuss the sample and variables. Second, I discuss the details of estimating the difference-in-difference approach.

A. Sample

The treatment sample comprises all firms that list on the Shanghai or Shenzhen Stock Exchange. The control sample comprises all firms that list on (1) the Hong Kong Stock Exchange, (2) KOSDAQ, or (c) the Taiwan Stock Exchange (TSE). I note that the TSE has a significantly different microstructure from the other markets[15] and thus the DD tests also examine a control sample that excludes the TSE.

The sample collection is as follows. First, I obtain intraday trade data from Sirca/Reuters. I filter the data to remove erroneous figures (such as trades for which volume data are missing). I only include trades that occur during ordinary market opening hours.[16] I use these data to compute microstructure-based measures of information asymmetry (discussed below). Both the treatment sample and the control sample span November 2002 to December 2003. Second, I match these data to firm-level data from Compustat Global; I allow the fundamental firm-level data to vary over time. I retain observations only if they have both Sirca/Reuters data and Compustat Global data.

Overall, this yields a treatment sample of 8,408 firm-month observations. The control sample comprises 5,689 firm-month observations from Hong Kong, 1,008 observations from Korea, and 6,313 observations from Taiwan. The number of observations per month is approximately constant. I acknowledge that there might be some sample selection bias; Compustat Global does not contain data for all firms in China and covers mainly larger firms. However, this sample selection bias afflicts both the preevent period and the postevent period, so should not bias the conclusions about the impact of the event.

The sample period of 14 months does raise two issues. First, I acknowledge that the cyclicality of corporate reporting might be an issue (Rau & Stouraitis 2011): there are two preevent months, which are November and December 2002. China's financial year ends on December 31. However, this should concentrate many announcements in December and should actually reduce the presence of informed trade in the preevent period. This makes it even more difficult to find that the SPC's judgment reduced informed trade. That is, it makes it harder to find that the judgment improved market quality. Second, the preevent period is shorter than the postevent period. I address this in robustness tests (in Appendix B) by using a similar method to that used in Bertrand et al. (2004). Further, in Appendix A, I analyze a daily measure of informed trade and use a longer time horizon.

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[15]For example, the TSE has shorter exchange operating hours (from 0900–1330); has a separate block trading period that is open from 0900 to 1500; has an official off-market trading period from 1400–1430 in which prices trade at the "official" close price; and limits price movements to within 7 percent of the previous day's close.

[16]For Shanghai and Shenzhen: 0930–1130 and 1300–1500; for Taiwan: 0900–1330; for Hong Kong: 1000–1600; for Korea: 0800–1500.

B. Informed Trade Measures

I use three measures of informed trade. I analyze informed trade because it provides insight into the information environment. Brown and Hillegeist (2007) argue that improved disclosure quality reduces the likelihood that investors discover and trade on private information. Subsequently, improved disclosure will reduce measures of informed trade whereas worsened disclosure will increase measures of informed trade. Similarly, I examine the impact of a legal change that is supposed to improve disclosure quality. No measure of informed trade is perfect (see Aktas et al. 2007). However, the use of multiple measures helps ensure that the results are robust. In the main models I use three microstructure-based measures of informed trade and in Appendix A, I examine daily bid-ask spreads.

1. PIN

PIN is the probability of informed trading (PIN). PIN has received prolific use (Easley et al. 1996a; see also Easley et al. 1996b, 1997, 2002, 2010). However, PIN has received some criticism. For example, Aktas et al. (2007) find that order imbalance is a better measure of informed trade around takeovers than is PIN. The intuition behind PIN is that it is a proxy for the amount of trade that is by traders who are "privately informed." The idea is that if the information environment is worse, there will be more traders who will want to become privately informed and thus PIN will be higher.

The calculation of PIN is as follows. Consistent with Ellul and Pagano (2006), I estimate PIN using the maximum likelihood estimate of five parameters: the probability of the arrival of any new information (α), or of negative information (δ), the arrival rates of informed traders (μ), of uninformed ("liquidity") buyers (ε_b), and of uninformed ("liquidity") sellers (ε_s), with the arrival rate of all uninformed ("liquidity") traders being ε. The PIN measure is:

$$PIN = \frac{\alpha\mu}{\alpha\mu + 2\varepsilon}$$

To arrive at this measure, I follow the approach in Easley et al. (1996b) and classify buy orders and sell orders using the Lee and Ready (1991) algorithm (as per Aslan et al. 2011).

2. Absolute Order Imbalance

For each day I calculate the order imbalance as (Buy Orders – Sell Orders)/(Buy Orders + Sell Orders). This follows prior findings that order imbalance is an indicator of informed trade (Aktas et al. 2007, 2008). The intuition is that significantly more buy orders than sell orders is evidence of increased informed trade and thus worse disclosure. I classify trades as buy orders or sell orders using the Lee and Ready (1991) algorithm.

3. LSB Adverse Selection Spread Component

I use the Lin et al. (1995) adverse selection component of the bid-ask spread. Lin et al. (1995) break the bid-ask spread into two major components: the adverse selection

component and the order processing component. Prior literature suggests that the adverse selection component of the spread represents asymmetric information and informed trade (Kumar et al. 1998; Clarke et al. 2004; Ellul & Pagano 2006). The intuition is that if Trader A believes that Trader B is privately informed and is trading on private information, then Trader A will increase the bid-ask spread in order to compensate for being taken advantage of. Therefore, an increase in the adverse selection component of the spread should represent an increase in privately informed trade and a worsening of the information environment.

C. Control Variables

The control variables are firm-level characteristics that might influence the level of information asymmetry (see generally Aslan et al. 2011). Note that these variables do not change over time and thus do not directly explain changes in information asymmetry. Instead, they capture the possibility of a systematic change in information asymmetry that corresponds to systematic differences in the control variables. The control variable are described below.

1. ln(Assets)

This is the natural log of the firm's total assets (Compustat variable name: at). Prior literature suggests that larger firms are less speculative and generally have better disclosure practices (Spindler 2010). This appears especially important in China, where disclosure practices are more lax (Bai et al. 2004; Chen et al. 2005, 2006; Liu 2006).

2. Debt/Assets

The use of debt could influence informed trade in emerging markets. A key issue is the possibility of informed trade by the creditors (or their associated parties). This might induce a positive relationship between DEBT/ASSETS and informed trade. The variable DEBT/ASSETS is the firm's long-term debt (Compustat: dltt) scaled by its total assets.

3. CAPEX/Assets

Firms that focus on capital expenditures (rather than R&D or intangibles) might be easier to value and thus might have less informed trade. This follows the findings in Aboody and Lev (2000) that insiders sometimes use their knowledge about planned R&D announcements to earn trading profits. This should increase informed trade. The variable CAPEX/ASSETS is the firm's capital expenditure (Compustat: capx) scaled by its assets.

4. FCF/Assets

High free cash flows can connote high profitability. Profitable firms might attract interest especially from lay/retail investors. A large portion of China's trade involves retail investors (Tao 1999; Bassolino 2002; Eun & Huang 2002). Such investors are likely to be uninformed and thus should reduce measures of information asymmetry. Thus, FCF/ASSETS should be

negatively related to the level of informed trade. The variable FCF/ASSETS is the firm's free cash flow (Computat: oibdp – xint – txt – capx) scaled by its assets.

5. High-Tech Firm

The high-tech firm indicator equals 1 if the company is in a high-tech industry as defined in Loughran and Ritter (2004).[17] The rationale is that unlike CAPEX-intensive firms, high-tech firms typically rely on intangibles and R&D and thus might have higher informed trade.

D. Empirical Approach

I use a difference-in-difference (DD) approach.[18] The DD approach contains a treatment sample and a control sample. The treatment sample is exposed to the treatment in the second period but not in the first. The control sample is never exposed to the treatment. The DD model uses the control sample to adjust for changes in informed trade that are not related to the SPC's interpretation. The two issues are (1) the form of the model and (2) controlling for (potential) violations of the parallel trend assumption. I address these in turn.

1. The Model

In this context, the treatment is the SPC's interpretation (on January 9, 2003). The treatment sample is all companies that list on the Shanghai Stock Exchange or the Shenzhen Stock Exchange. The control sample is a set of companies that are exposed to similar macroeconomic and market movements. I choose firms listed in Hong Kong as the "main" control sample. However, I also examine firms in Taiwan and Korea and use a propensity score radius-matching technique. I focus on Hong Kong, Korea, and Taiwan because they are in the same economic region and have similar economic exposures.[19] I exclude firms that are cross-listed on grounds that they could contaminate either sample. The regression model has the following form:

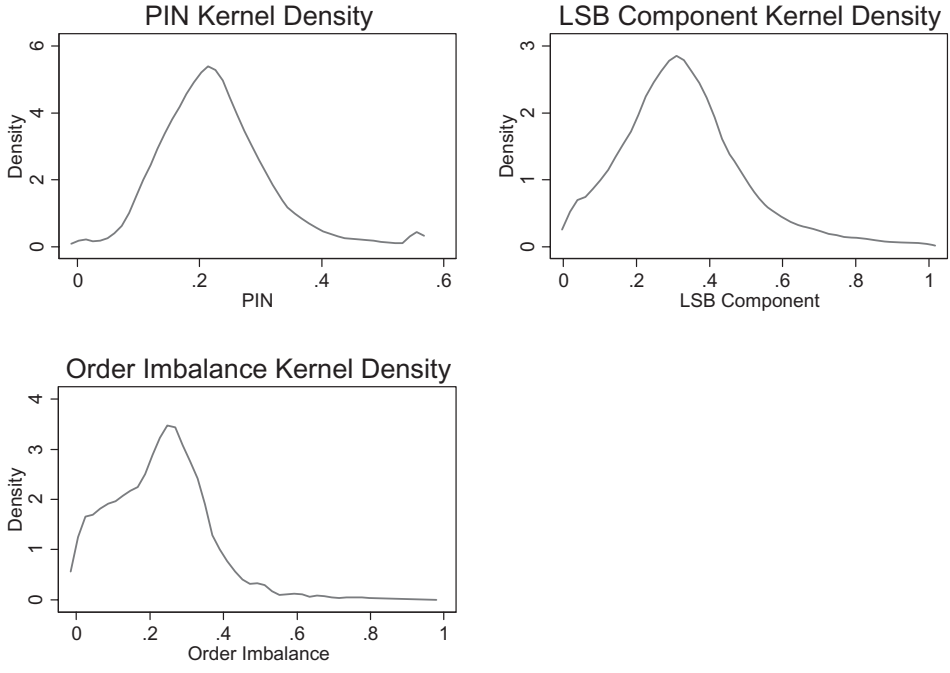
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[17]High-tech firms are firms in the following industries: computer hardware (SIC codes: 3571, 3572, 3575, 3577, 3578); communications equipment (3661, 3663, 3669); electronics (3671, 3672, 3674, 3675, 3677, 3678, 3679); navigation equipment (3812); measuring and controlling devices (3823, 3825, 3826, 3827, 3829); medical instruments (3841, 3845); telephone equipment (4812, 4813); communications services (4899); and software (7371, 7372, 7373, 7374, 7375, 7378, 7379).

[18]Prior studies have used this approach in a similar context (see Cumming et al. 2011). I also use a propensity score matching method to ensure that firms in all markets have similar characteristics and thus that they have similar risk exposures.

[19]I note that they are not exposed to precisely the same economic factors. However, all four countries are in the same MSCI "region."

Figure 1: Kernel density plots.



NOTE: This figure contains the kernel density plots for the dependent variables.

$$\text{Informed Trade}_{it} = \alpha + \text{I(China)}_{it}\,\beta_1 + \text{I(Treatment)}_{it}\,\beta_2 + \text{I(China)}_{it} \times \text{I(Treatment)}_{it}\,\beta_3 + \boldsymbol{X}_{it}\boldsymbol{\theta} + \varepsilon_{it}$$

Here, I(China) is a dummy that equals 1 if the firm lists on an exchange in mainland China, and I(Treatment) is a dummy that equals 1 if the observation postdates the treatment (i.e., the interpretation on January 9, 2003). The coefficient of interest is β_3; it indicates the impact of the interpretation on informed trade for Chinese companies. I use robust standard errors clustered by company and include month dummies to control for unobserved month effects. I estimate the model by using OLS.

2. The Estimation Methodology

I estimate the DD model by using OLS. The dependent variable is bounded between 0 and 1. This raises the concern that OLS will be inappropriate if there are significant violations of the assumption of normality. Nonetheless, the kernel density plots of the dependent variables (in Figure 1) suggest that at least PIN and the LSB component are close to normally distributed and the order imbalance figure is largely normally distributed. If there were significant departures from normality, the typical approach would be to take the log-transform of the dependent variables; however, in unreported figures, such log trans-

forms are not significantly more nonnormal than are the raw variables (in addition to having the disadvantage of eliminating observations for which the dependent variable equals 0). Subsequently, I estimate the models using OLS and without transforming the dependent variable.

3. The Choice of Control Countries

The control firms should ideally be "similar in nature" to the Chinese companies, but for (1) the strength of the securities regulator and (2) the change in securities law.[20] That is, the control countries should have (1) strong securities laws, (2) strong regulators, and (3) exposure to similar economic forces. I choose Hong Kong, Korea, and Taiwan because they may satisfy these requirements. This is for several reasons. First, the evidence of regional integration and regional trade suggests that the countries are exposed to similar economic forces (Yang et al. 2003; Huyghebaert & Wang 2010).[21] Second, they are in similar time zones and thus would have similarly contemporaneous exposure to global events (see generally Moulton & Wei 2009). Third, the countries are geographically proximate and thus thereby enable better information transmission between the markets (see Ragozzino & Reuer forthcoming; Aggarwal et al. 2012), which should further connect the markets. Fourth, there is evidence of increasing stock market integration between these countries (Forbes & Rigobon 2002; Frijns et al. 2012), implying some similarity in the financial markets.

Hong Kong has had a stable, and relatively principled, system of securities regulation (for a summary of rules and regulations, see Securities and Futures Commission 2002). Further, Hong Kong has historically had strong disclosure laws and regulation thereof (see Wallace & Naser 1995).

Korean regulations and securities laws are comparatively strong (see Nam et al. 1999). Laws/regulations were stable throughout the period of the empirical analysis; however, some changes occurred from January 1, 2005 (Financial Supervisory Service 2005). Prior to January 1, 2005, securities class actions were comparatively difficult to establish. I check that this does not contaminate the results by ensuring that the results are qualitatively the same if I exclude Korea from the set of control countries.

Taiwan appears to have had relatively strong private enforcement of public sanctions for securities misconduct during the period of this study, scoring highly in measures of securities law enforcement (see La Porta et al. 2006). Further, Taiwan has unofficially allowed civil actions to "piggy back" on criminal actions for misconduct, and the Securities and Futures Commission has established the Securities and Futures Market Development Institute for the purpose of facilitating civil suits (see Liu 2000).

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[20]It is impossible to find a "perfect" match. For example, China has some unique trading practices, such as a "T+1" trading rule (see Guo et al. 2012). However, using a difference-in-difference approach implicitly accounts for these factors by comparing China's situation preevent with its situation postevent.

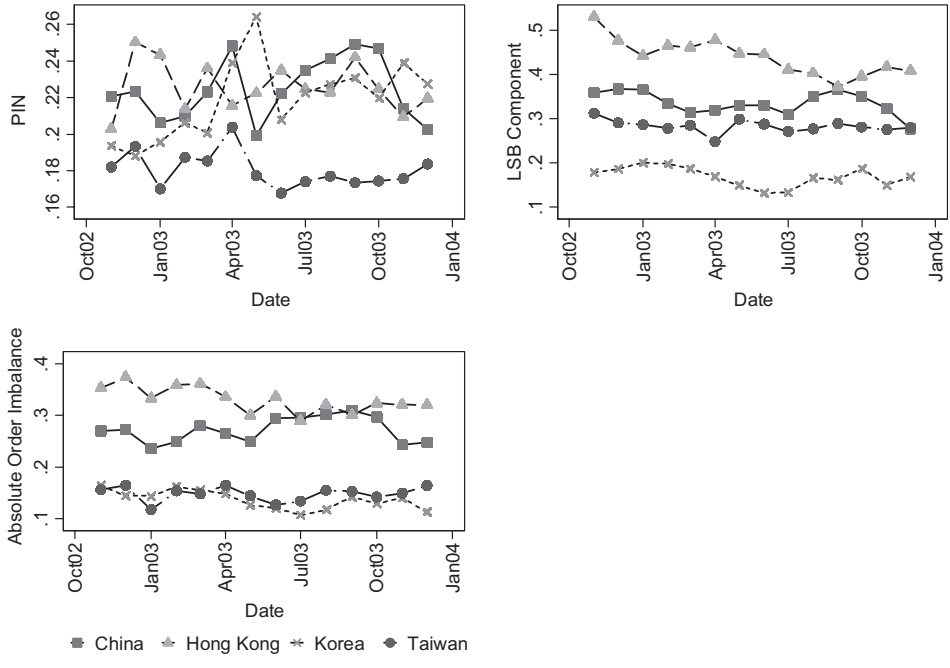
[21]This regional integration is not unique to the Asia-Pacific region; prior literature has also documented integration in the Latin American region (Chen et al. 2002).

Overall, this suggests that Hong Kong, Korea, and Taiwan could be appropriate countries from which to obtain control firms. Still, I ensure that the results are robust to violations of this assumption by (1) using propensity score matching and (2) ensuring the results are qualitatively the same when I omit particular countries from the control sample (see below).

4. The Parallel Trend Assumption and Ensuring Robustness to Violations Thereof

A key assumption is the "parallel trend" assumption. This assumption is that the control sample (China) has the same trend as the treatment sample (Hong Kong, Korea, or Taiwan). That is, but for the court's interpretation, informed trade in China and Hong Kong/Korea/Taiwan would follow the same trend.[22] I test for violations of the parallel trend assumption by graphically examining the pattern of monthly informed trade (see Figure 2).

Figure 2: Plots for the various measures of informed trade over time.



NOTE: The lot starts at November 2002 and ends at October 2003. The dot points represent the average informed trade component for that month.

[22]Note that they need only follow the same trend or pattern of informed trade; they need not have the same "level" of informed trade.

Figure 2 contains the informed trade measures by month, with each subfigure showing the pattern for one informed trade measure. The subfigures do not indicate a significant relative decrease in China's informed trade measures after December 2003. China's trend prior to the pre-SPC interpretation seems most similar to Taiwan's, with no noticeable relative decrease after the interpretation. Although the time trends for all comparison countries are not uniformly parallel by all measures, and the preinterpretation data are for a less than optimally long time period (only two months), none of the comparison trends supports a relative decrease in informed trading after the SPC interpretation. The fluctuations in China following January 2003 might suggest uncertainty about the precise functioning of the SPC's interpretation and appear consistent with the stock price patterns around U.S. government policy announcements reported in Pastor and Veronesi (2010).

Even though the parallel trend assumption appears to hold in the sample, I mitigate concerns about violations of it in two ways.

First, I separately examine control samples that comprise firms from (1) all of Hong Kong, Korea, and Taiwan, (2) only Hong Kong and Korea, on grounds that Taiwan has a significantly different microstructure from the other markets, and (3) just Hong Kong, on grounds that Hong Kong is legally part of China, some firms cross-list in both Hong Kong and China, and there is overlap in the location of operations for companies from either country.[23]

Second, I also use a propensity score radius-matching-type approach. The idea here is to remove from the sample any control sample observations that are "too different" from treatment sample observations. This functions by generating a score that reflects the likelihood of being a treatment sample firm, and then removing control sample firms whose scores are too different.

The analysis proceeds as follows. (1) I use a probit model to determine the probability that a firm is on a market in China (as opposed to Hong Kong, Taiwan, or Korea) as a function of firm-level characteristics.[24] The idea is to establish which variables correlate with a firm being Chinese. This creates a "Chinese-type" firm against which to compare companies that are not listed in China. For example, a positive coefficient on ln(Assets) would imply that Chinese companies are larger. (2) I compute two-tailed 80 percent and 90 percent confidence intervals for the propensity score. (3) I exclude any firms that have a propensity score in the top 5 percent or bottom 5 percent of the sample for a 90 percent confidence interval, or in the top 10 percent and bottom 10 percent of the sample for a 80 percent confidence interval.[25] I use this approach rather than a matched firm approach

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[23]My sample excludes cross-listed firms. However, the presence of cross-listed firms can generally lead to greater market integration due to greater information linkages between countries.

[24]These are ln(assets), debt/assets, CAPEX/assets, the high-tech firm dummy, FCF/assets, R&D/sales, and intangibles/assets.

[25]A similar approach has also featured in other literature (see Becker & Ichino 2002; Glick et al. 2006; Volpe Martincus & Carballo 2008; Hale & Santos 2009).

because there is no ex ante reason to believe that firm-level characteristics are a perfect match for informed-trade-based trends. Thus, a matched firm approach might reduce the amount of information in the sample.

IV. Analysis and Results

This section contains the analysis and results. Section IV.A contains the univariate analysis. Section IV.B contains the multivariate regression analysis. The conclusion is that informed trade appears to have increased following the interpretation date.

A. Univariate Analysis

I break the univariate analysis into the sample description, an analysis of straight informed trade figures, and a difference-in-difference univariate analysis.

1. Sample Description

Table 2 contains basic sample statistics. There are some differences in firm-level characteristics between firms from the four countries. An important point is that there are nearly five times more high-tech firms in Taiwan than in China. This suggests that Taiwan might be distinguishable from China. The level of informed trade appears lower in Korea and Taiwan than it is in China and Hong Kong. However, caution is necessary vis-à-vis the PIN, LSB component, and order imbalance statistics in Table 2 because they are means and medians over the whole period (both before and after the interpretation date).

Table 3 contains sample statistics for the sample of Chinese firms and the sample of non-Chinese firms. This table also contains sample statistics for the subsample of non-Chinese firms that have been selected by using propensity score matching techniques. The results indicate that there are significant differences between Chinese and non-Chinese firms. Further, there are significant differences between the full sample of non-Chinese firms and the propensity score matched sample of non-Chinese firms. These results imply that propensity score matching does help to achieve a better covariate balance.

2. Analysis of Informed Trade Per Se

Table 4 contains a univariate analysis of the informed trade measures. Column 1 contains the values for China. Columns 2–5 contain the values for Hong Kong, Korea, Taiwan, and the combination of all three, respectively. Column 6 contains the difference between China (Column 1) and the full control sample (Column 4). The results suggest that China has significantly higher PIN and order imbalance than the control sample. The results for the LSB component are mixed in sign and significance. However, it is important to not draw conclusions from these results because they are not difference-in-difference results.

Figure 3 contains the average PIN, LSB component, and order imbalance for periods before, during, and after the interpretation month (January 2003). The before period

Table 2: Sample Statistics for the Treatment and the Control Sample

	China	*Hong Kong*	*Korea*	*Taiwan*
Month-firm observations	8,408	5,696	1,008	6,313
Number of firms	608	475	87	458
Panel A: Sample Means				
PIN	0.224	0.226	0.218	0.180
LSB component	0.336	0.439	0.171	0.283
Order imbalance	0.272	0.330	0.137	0.148
ln(assets)	7.339	6.960	11.736	8.938
Leverage	0.055	0.082	0.090	0.098
CAPEX/assets	0.072	0.051	0.063	0.048
High-tech firm	0.055	0.134	0.067	0.213
FCF/assets	–0.034	–0.079	–0.024	0.022
Panel B: Sample Medians				
PIN	0.224	0.239	0.215	0.169
LSB component	0.333	0.401	0.165	0.274
Order imbalance	0.273	0.273	0.130	0.126
ln(assets)	7.264	6.897	11.589	8.784
Leverage	0.020	0.020	0.050	0.071
CAPEX/assets	0.053	0.029	0.050	0.025
FCF/assets	–0.013	0.008	–0.010	0.024

NOTE: Panel A contains sample means. Panel B contains sample medians. Note that the figures are for the whole time period. Importantly, the PIN, LSB component, and order imbalance figures reflect observations that occur both before and after the SPC's interpretation. These figures are for the full sample of Chinese and non-Chinese firms.

Table 3: Sample Statistics Comparing Chinese and Non-Chinese Companies

Variable	*Chinese* [1]	*Non-Chinese (Full Sample)* [2]	*Non-Chinese (P Score Matched)* [3]	*Chinese – Non-Chinese (Full)* [4] = [1] – [2]	*Chinese – Non-Chinese (P score)* [5] = [1] – [3]	*Difference in Difference* [6] = [4] – [5]
PIN	0.224	0.203	0.208	0.021***	0.016***	0.005***
LSB component	0.336	0.342	0.350	–0.006**	–0.014**	0.008
Order imbalance	0.272	0.227	0.240	0.045***	0.033***	0.013***
ln(assets)	7.339	8.293	8.320	–0.954***	–0.982***	0.027***
Leverage	0.055	0.090	0.090	–0.036***	–0.035***	0.000***
CAPEX/assets	0.072	0.050	0.051	0.022***	0.021***	0.001***
High-tech firm	0.055	0.168	0.110	–0.113***	–0.055***	–0.057***
FCF/assets	–0.034	–0.026	–0.016	–0.008***	–0.018***	0.010***

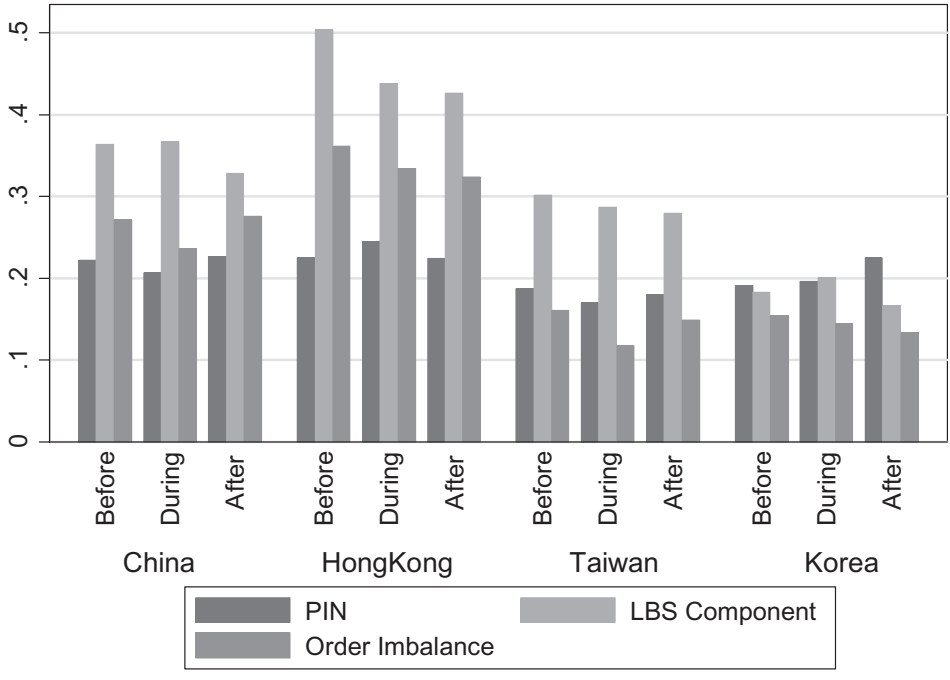
NOTE: This table contains summary statistics (sample means) that compare the sample of Chinese companies with the sample of non-Chinese companies. I report both the full sample of non-Chinese companies and the subsample of non-Chinese companies that have been matched based using a propensity score technique with an 80 percent interval. The figures are sample means and superscripts ***, **, and * denote significance at 1 percent, 5 percent, and 10 percent, respectively.

Table 4: Univariate Statistics for the PIN, LSB Component, and Order Imbalance Sorted by the Country of Listing and Month of Observation

	China (1)	*Hong Kong* (2)	*Korea* (3)	*Taiwan* (4)	*All Control* (5)	*China – Control* (6) = (1) – (5)
PIN						
Nov 02	0.221	0.203	0.194	0.182	0.193	0.028***
Dec 02	0.223	0.250	0.188	0.193	0.218	0.006
Jan 03	0.206	0.244	0.196	0.170	0.203	0.003
Feb 03	0.210	0.213	0.206	0.187	0.200	0.010**
Mar 03	0.223	0.235	0.201	0.185	0.208	0.015***
Apr 03	0.248	0.216	0.239	0.204	0.212	0.037***
May 03	0.199	0.223	0.264	0.177	0.203	–0.004
Jun 03	0.222	0.234	0.208	0.168	0.201	0.021***
Jul 03	0.235	0.225	0.223	0.174	0.200	0.035***
Aug 03	0.241	0.222	0.227	0.177	0.201	0.040***
Sep 03	0.249	0.242	0.231	0.173	0.209	0.041***
Oct 03	0.247	0.224	0.215	0.174	0.200	0.047***
Nov 03	0.214	0.209	0.239	0.176	0.195	0.020***
Dec 03	0.202	0.219	0.227	0.184	0.203	0.000***
Overall	0.224	0.225	0.218	0.180	0.203	0.021***
LSB Component						
Nov 02	0.360	0.530	0.179	0.312	0.406	–0.046***
Dec 02	0.367	0.477	0.186	0.290	0.363	0.005
Jan 03	0.367	0.439	0.201	0.287	0.342	0.024***
Feb 03	0.334	0.467	0.199	0.278	0.350	–0.016
Mar 03	0.314	0.462	0.188	0.285	0.352	–0.038***
Apr 03	0.319	0.477	0.169	0.248	0.334	–0.015
May 03	0.330	0.449	0.150	0.299	0.351	–0.021*
Jun 03	0.330	0.445	0.132	0.289	0.348	–0.018
Jul 03	0.309	0.410	0.134	0.271	0.319	–0.009
Aug 03	0.351	0.404	0.166	0.278	0.324	0.027***
Sep 03	0.365	0.372	0.162	0.289	0.316	0.049***
Oct 03	0.351	0.396	0.192	0.282	0.324	0.026***
Nov 03	0.324	0.419	0.148	0.275	0.330	–0.006
Dec 03	0.277	0.409	0.169	0.280	0.328	–0.050***
Overall	0.336	0.440	0.171	0.283	0.342	–0.007
Order Imbalance						
Nov 02	0.270	0.352	0.165	0.157	0.250	0.020*
Dec 02	0.273	0.374	0.144	0.165	0.254	0.018*
Jan 03	0.236	0.334	0.144	0.118	0.211	0.026***
Feb 03	0.249	0.358	0.162	0.154	0.241	0.008
Mar 03	0.280	0.363	0.155	0.148	0.241	0.039***
Apr 03	0.266	0.336	0.148	0.165	0.234	0.032***
May 03	0.249	0.300	0.126	0.144	0.209	0.040***
Jun 03	0.294	0.338	0.121	0.127	0.222	0.073***
Jul 03	0.296	0.289	0.107	0.135	0.199	0.097***
Aug 03	0.302	0.320	0.118	0.155	0.225	0.077***
Sep 03	0.309	0.301	0.143	0.154	0.219	0.091***
Oct 03	0.297	0.324	0.123	0.142	0.221	0.077***
Nov 03	0.244	0.323	0.142	0.150	0.226	0.017**
Dec 03	0.248	0.320	0.113	0.164	0.229	0.019**
Overall	0.272	0.331	0.137	0.148	0.227	0.045***

NOTE: The statistics are sample means. Superscripts ***, **, and * in Column 6 denote significant difference in means (between China and the three control markets) at 1 percent, 5 percent, and 10 percent, respectively.

Figure 3: Sample average PIN, LSB component, and order imbalance for before, during, and after the SPC's interpretation.



NOTE: The before period includes November and December 2002. The during period is January 2003. The after period is from February 2003 to December 2003.

spans November and December 2002. The during period is January 2003. The after period is February 2003 to December 2003. For China, the figure suggests a modest increase in PIN and order imbalance but a slight decrease in the LSB component. For Hong Kong and Taiwan, the PIN and order imbalance appear unchanged and the LSB component appears to decrease. For Korea, the PIN appears to increase. The important implication is that in control samples that include Korea, it will be *more* difficult to conclude that China's PIN increased.

3. Univariate Difference in Difference

The univariate difference-in-difference results are in Table 5. Columns 1–5 examine the difference between informed trade after the interpretation date and before the interpretation date for China, Hong Kong, Korea, and Taiwan. That is, it contains $\Delta\text{Informed Trade}^{\text{After}}_{\text{Before}} = \text{Informed Trade}_{\text{After}} - \text{Informed Trade}_{\text{Before}}$. Columns 6–9 examine the difference in $\Delta\text{Informed Trade}^{\text{After}}_{\text{Before}}$ between (1) China and (2) each of Hong Kong, Taiwan, Korea, and the full set of all three countries. That is, Columns 6–9

Table 5: PIN, LSB Component, and Order Imbalance for China, Hong Kong, Korea, Taiwan, and the Full Control Sample

Variable	*Informed Trade$_{After}$ – Informed Trade$_{Nov02}$*					*Difference in: Informed Trade$_{After}$ – Informed Trade$_{Nov02}$*			
After Date	*China* (1)	*Hong Kong* (2)	*Korea* (3)	*Taiwan* (4)	*All Control* (5)	*China – Hong Kong* (6)	*China – Korea* (7)	*China – Taiwan* (8)	*China – All Control* (9)
PIN									
Feb 03	–0.011	0.003	0.005	0.006	0.005	–0.014	–0.016*	–0.017***	–0.015**
Mar 03	0.003	0.015	0.000	0.004	0.008	–0.012	0.003	–0.002	–0.006
Apr 03	0.027	–0.007	0.039	0.022	0.011	0.034***	–0.012	0.005	0.016**
May 03	–0.021	0.000	0.060	–0.002	0.003	–0.021**	–0.081***	–0.019***	–0.024***
Jun 03	0.001	0.022	0.004	–0.012	0.004	–0.02**	–0.003	0.013**	–0.003
Jul 03	0.014	0.012	0.022	–0.007	0.003	0.002	–0.008	0.022***	0.011
Aug 03	0.021	0.012	0.029	–0.005	0.005	0.008	–0.008	0.025***	0.015**
Sep 03	0.029	0.030	0.030	–0.009	0.012	–0.002	–0.002	0.037***	0.017**
Oct 03	0.026	0.011	0.016	–0.007	0.003	0.015*	0.01	0.033***	0.023***
Nov 03	–0.007	–0.006	0.041	–0.005	–0.002	–0.001	–0.047***	–0.002	–0.004
Dec 03	–0.018	0.011	0.028	0.002	0.008	–0.029***	–0.046***	–0.021***	–0.026***
LSB Component									
Feb 03	–0.026	–0.022	0.030	–0.029	–0.021	–0.004	–0.056***	0.003	–0.005
Mar 03	–0.047	–0.017	0.019	–0.022	–0.016	–0.03**	–0.065***	–0.024**	–0.03***
Apr 03	–0.041	0.014	–0.002	–0.061	–0.026	–0.056***	–0.039**	0.02*	–0.016
May 03	–0.032	–0.033	–0.015	–0.008	–0.019	0.002	–0.016	–0.023**	–0.012
Jun 03	–0.031	–0.051	–0.028	–0.022	–0.035	0.02	–0.003	–0.01	0.004
Jul 03	–0.052	–0.075	–0.035	–0.041	–0.055	0.023	–0.017	–0.011	0.003
Aug 03	–0.010	–0.088	–0.005	–0.034	–0.055	0.078***	–0.004	0.024**	0.046***
Sep 03	0.004	–0.127	–0.012	–0.021	–0.067	0.132***	0.016	0.025**	0.072***
Oct 03	–0.010	–0.098	0.020	–0.029	–0.055	0.088***	–0.03	0.019*	0.045***
Nov 03	–0.037	–0.075	–0.019	–0.035	–0.052	0.038***	–0.018	–0.001	0.015
Dec 03	–0.083	–0.090	–0.009	–0.032	–0.056	0.007	–0.074***	–0.052***	–0.028***
Order Imbalance									
Feb 03	–0.020	0.017	0.009	–0.001	0.008	–0.037**	–0.029***	–0.019**	–0.028***
Mar 03	0.011	0.033	0.002	–0.006	0.011	–0.022*	0.009	0.017**	0
Apr 03	–0.004	0.022	–0.003	0.010	0.014	–0.025*	–0.001	–0.014*	–0.017*
May 03	–0.020	–0.018	–0.027	–0.007	–0.013	–0.003	0.007	–0.013*	–0.007
Jun 03	0.025	–0.002	–0.045	–0.026	–0.016	0.027*	0.07***	0.051***	0.041***
Jul 03	0.026	–0.047	–0.045	–0.022	–0.034	0.073***	0.071***	0.048***	0.061***
Aug 03	0.032	–0.021	–0.033	–0.002	–0.013	0.054***	0.066***	0.034***	0.045***
Sep 03	0.040	–0.042	–0.009	–0.002	–0.020	0.082***	0.049***	0.041***	0.06***
Oct 03	0.028	–0.018	–0.026	–0.013	–0.016	0.045***	0.054***	0.04***	0.044***
Nov 03	–0.026	–0.018	–0.008	–0.005	–0.011	–0.008	–0.018	–0.021*	–0.015
Dec 03	–0.022	–0.024	–0.034	0.008	–0.009	0.002	0.012	–0.029***	–0.012

NOTE: The variable in Columns 1–5 is the informed trade measure at the "after date" (stated in Column 1) less the informed trade value in November 2002. That is, it is the value of Informed Trade$_{After}$ – Informed Trade$_{Nov02}$. The values are sample means. The value in Columns 6–9 is the difference in the value of Informed Trade$_{After}$ – Informed Trade$_{Nov02}$ in China and in the control sample (variously, Hong Kong, Korea, Taiwan, or all three control countries). That is, Columns 6–9 contain univariate difference-in-difference statistics. Superscripts ***, **, and * denote significance difference in means at 1 percent, 5 percent, and 10 percent, respectively.

contain the univariate difference-in-difference value: $DD = (\Delta\text{Informed Trade China}^{\text{After}}_{\text{Before}} - \Delta\text{Informed Trade Hong Kong}^{\text{After}}_{\text{Before}})$.

The main results in Columns 1–5 of Table 5 indicate: (1) in China, PIN and order imbalance increased but the LSB component decreased and (2) for the control samples, PIN increased and LSB decreased in all three other control sets (as with China) but order imbalance decreased. The difference-in-difference results in Columns 6–9 indicate that the LSB component and order imbalance increased significantly more in China than in the control samples. The PIN increased significantly more in China than in Taiwan and insignificantly more in China than in the other control countries.

The overall implication is that there may have been a modest increase in informed trade in China after the interpretation. There is no evidence that the interpretation decreased informed trade.

B. Multivariate Regression Analysis

The multivariate regression analysis suggests that informed trade increased after the interpretation date. I examine the following control samples: (1) a full set of firms from Hong Kong, Korea, and Taiwan, (2) firms from Hong Kong and Korea, (3) only firms from Hong Kong, (4) firms whose propensity score falls within the 90 percent confidence interval, and (5) firms whose propensity score is within the 80 percent confidence interval. The purpose behind samples (2) and (3) is to progressively remove firms from the control sample who are less likely to be like firms from China. The purpose behind samples (4) and (5) is to restrict the sample to firms that are like Chinese firms.

The propensity score model functions as follows. First, I obtain the set of firms that list on a stock exchange in China or in Hong Kong. The indicator I(China) equals 1 if the firm lists in China. Second, I estimate a probit regression where the dependent variable is the indicator I(China) and the independent variables are firm-level characteristics that might concentrate in Chinese firms. The goal is to identify which characteristics are common for Chinese firms. Third, I obtain the propensity score from the probit regression. Fourth, I construct a 90 percent confidence interval for the propensity scores. Fifth, I exclude observations that lie outside the 90 percent confidence interval. The propensity score regression is in Table 6.

The difference-in-difference (DD) results show that the interpretation did not reduce informed trade. Table 7 examines PIN. Table 8 examines the LSB component. Table 9 examines the absolute order imbalance. The coefficient of interest is the coefficient on I(China) × I(After January). For PIN (Table 7) and order imbalance (Table 9), the coefficient is significant and positive at 1 percent in all control samples. This implies that both PIN and absolute order imbalance increased after the SPC's interpretation. For the LSB component, the sign varies and is only weakly significant (at 10 percent significance) in two control samples. This implies no significant change in the LSB component following the SPC's interpretation.

These results are economically meaningful. While PIN fell (after January 2003) for both Chinese and non-Chinese companies, the reduction was 0.011 smaller for China (i.e.,

Table 6: Results from Probit Model Where Dependent Variable is an Indicator that Equals 1 if the Firm Lists on a Chinese Stock Exchange and Equals 0 Otherwise

Dependent Variable	*I(China)*
ln(assets)	–0.054
	[0.123]
Debt/assets	–2.461***
	[0.000]
CAPEX/assets	3.461***
	[0.000]
High-tech firm	–0.473**
	[0.040]
FCF/assets	0.353*
	[0.080]
R&D/sales	–190.071***
	[0.000]
Intangibles/assets	0.441
	[0.407]
Constant	0.483*
	[0.088]
Observations	1,408
Pseudo R^2	23.40%
Wald chi-2	79.871

NOTE: The sample is only over one time period (so year dummies are unnecessary). The model uses robust standard errors clustered by four-digit SIC industry. Brackets contain *p* values. Superscripts ***, **, and * denote significance at 1 percent, 5 percent, and 10 percent, respectively.

PIN fell by less in China).[26] This is economically meaningful given that the mean PIN is 0.224 (and thus the difference in difference is 4.9 percent of the mean PIN). Further, order imbalance increased in China by 0.029 more than it did in other countries (this difference is 10.6 percent of the mean order imbalance of 0.272).[27]

Some of the control variables have interesting signs and significance levels. The most consistent result is that large firms have lower levels information asymmetry (i.e., size is negatively related to the LSB component and order imbalance, although its relationship to PIN varies). This is consistent with prior evidence and reflects the fact that there is more publicly available information about large companies (Lau et al. 2010; Aslan et al. 2011).

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[26]To calculate this, examine the coefficients in Table 7, Column 1. To compare non-Chinese companies before with non-Chinese companies after, examine $\beta(After)$: these companies have a reduction in PIN of 0.039. To compare Chinese companies before with Chinese companies after, calculate: $[\beta(China) + \beta(After) + \beta(China) \times \beta(After)] - \beta(China) = -0.028$. Thus, Chinese companies have a reduction in PIN of 0.028. Therefore, for Chinese companies, PIN reduced by 0.011 less than it did for non-Chinese companies.

[27]The calculation is similar to the calculation for PIN. Here, the increase in order imbalance for Chinese companies is: $[\beta(China) + \beta(After) + \beta(China) \times \beta(After)] - \beta(China) = 0.374$. The increase in order imbalance for non-Chinese companies is $\beta(After) = 0.374$. Thus, Chinese companies experienced an increase of 0.029 compared with non-Chinese companies.

Table 7: Difference in Difference: PIN

Dependent Variable	*PIN*				
Control Sample	*Hong Kong, Korea, Taiwan* (1)	*Hong Kong, Korea* (2)	*Hong Kong* (3)	*Propensity Score: 90% Interval* (4)	*Propensity Score: 80% Interval* (5)
I(China)	0.011***	–0.006	–0.015**	0.004	0.004
	[0.007]	[0.270]	[0.013]	[0.343]	[0.345]
I(after January)	–0.039	–0.08	–0.083	–0.043	–0.046
	[0.501]	[0.238]	[0.225]	[0.465]	[0.442]
I(China) × I(after January)	0.011***	0.010**	0.016***	0.012***	0.013***
	[0.002]	[0.030]	[0.003]	[0.002]	[0.001]
ln(assets)	–0.002	0.003**	0.007***	–0.002*	–0.002*
	[0.113]	[0.031]	[0.000]	[0.065]	[0.072]
Leverage	–0.013	–0.01	–0.021	0.003	0.004
	[0.354]	[0.537]	[0.188]	[0.855]	[0.831]
CAPEX/assets	0.002	0.048**	0.047**	0.062**	0.063*
	[0.652]	[0.029]	[0.038]	[0.038]	[0.058]
High-tech firm	–0.018***	–0.005	–0.002	–0.015***	–0.015***
	[0.000]	[0.438]	[0.745]	[0.003]	[0.004]
FCF/assets	–0.002	–0.002	–0.005	0.007	0.002
	[0.513]	[0.738]	[0.199]	[0.384]	[0.768]
Constant	0.230***	0.290***	0.265***	0.254***	0.232***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Observations	21,416	15,103	14,096	17,698	16,623
R^2	0.023	0.014	0.02	0.018	0.018
F statistic	15.516	11.128	13.296	12.1	10.967

NOTE: This table contains difference-in-difference regression results where the dependent variable is the monthly PIN. The column title contains the control sample. The main independent variable of interest is China × After January, the interaction of indicators that equal 1 if (1) the firm lists in mainland China and (2) the observation postdates January 9, 2003. The control samples in Columns 1, 2, and 3 are all companies in Hong Kong, Korea, and Taiwan; Hong Kong and Korea; and just Hong Kong, respectively. The control samples in Columns 4 and 5 are based on the 90 percent and 80 percent propensity score intervals, respectively. The models are OLS regressions and include month dummies and use robust standard errors clustered by firm. Brackets contain *p* values. Superscripts ***, **, and * denote significance at 1 percent, 5 percent, and 10 percent, respectively.

One surprising result is that the high-tech dummy is often negatively (and sometimes significantly) associated with PIN, order imbalance, and the LSB component.

The overall implication of these results is that informed trade did not decrease following the SPC's interpretation on January 9, 2003. The results suggest that informed trade actually increased (or at best did not change). This implies that the interpretation did not succeed in its purpose of reducing informed trade and market misconduct.

V. Conclusion

This article analyzes the question: Is strong law effective in the presence of poor regulation? I analyze whether law reform is sufficient to improve the economic environment even if the country does not improve the regulatory environment. I do this by using the SPC's guideline judgment on the "false statement" doctrine as a natural experiment. Here, the SPC

Table 8: Difference-in-Difference LSB Component Models

Dependent Variable	*LSB Component*				
Control Sample	*Hong Kong, Korea, Taiwan* (1)	*Hong Kong, Korea* (2)	*Hong Kong* (3)	*Propensity Score: 90% Interval* (4)	*Propensity Score: 80% Interval* (5)
I(China)	–0.057***	–0.082***	–0.082***	–0.061***	–0.058***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
I(after January)	0.051	0.034	0.029	0.041	0.042
	[0.618]	[0.793]	[0.823]	[0.693]	[0.681]
I(China) × I(after January)	–0.004	0.009	0.012*	–0.007	–0.009*
	[0.463]	[0.158]	[0.095]	[0.202]	[0.097]
ln(assets)	–0.058***	–0.056***	–0.059***	–0.058***	–0.058***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Leverage	–0.026	–0.018	–0.02	–0.028	–0.027
	[0.192]	[0.474]	[0.446]	[0.334]	[0.368]
CAPEX/assets	0.006	–0.051	–0.05	–0.04	–0.052
	[0.465]	[0.193]	[0.222]	[0.481]	[0.401]
High-tech firm	–0.012*	0.006	0.008	–0.007	–0.007
	[0.074]	[0.564]	[0.463]	[0.350]	[0.378]
FCF/assets	0.011*	0.017***	0.020***	–0.005	–0.001
	[0.084]	[0.000]	[0.000]	[0.780]	[0.945]
Constant	0.761***	0.795***	0.880***	0.849***	0.850***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Observations	21,300	14,993	13,986	17,593	16,524
R^2	0.294	0.291	0.251	0.295	0.295
F statistic	86.771	64.133	52.592	75.471	72.803

NOTE: This table contains difference-in-difference regression results where the dependent variable is the monthly LSB component. The column title contains the control sample. The main independent variable of interest is China × After January, the interaction of indicators that equal 1 if (1) the firm lists in mainland China and (2) the observation postdates January 9, 2003. The control samples in Columns 1, 2, and 3 are all companies in Hong Kong, Korea and Taiwan; Hong Kong and Korea; and just Hong Kong, respectively. The control samples in Columns 4 and 5 are based on the 90 percent and 80 percent propensity score intervals, respectively. The models are OLS regressions and include month dummies and use robust standard errors clustered by firm. Brackets contain *p* values. Superscripts ***, **, and * denote significance at 1 percent, 5 percent, and 10 percent, respectively.

promulgated principled law reforms; however, the regulator (the CSRC) remained unchanged. That is, there was principled law reform absent regulatory reform.

I analyze the impact of law reform absent regulatory form by using a difference-in-difference (DD) approach. The treatment is the SPC's January 9 interpretation. The treatment sample comprises all firms that list on the Shanghai or Shenzhen Stock Exchange. The control sample comprises firms that list on the Hong Kong Stock Exchange, Taiwan Stock Exchange, or KOSDAQ. I test whether the SPC's guideline judgment reduced (possible) financial market misconduct by testing for differences in measures of informed trade. I find that three measures of informed trade actually increase following the SPC's interpretation.[28] This implies that the principled law reform absent regulatory reform does not reduce informed trade and improve the market's information environment.

[28]PIN and order imbalance significantly increase in all reported tests. The adverse selection component increases in the main model specifications, but not in all robustness tests.

Table 9: Difference-in-Difference Order Imbalance Models

Dependent Variable	*Order Imbalance*				
Control Sample	*Hong Kong, Korea, Taiwan* (1)	*Hong Kong, Korea* (2)	*Hong Kong* (3)	*Propensity Score: 90% Interval* (4)	*Propensity Score: 80% Interval* (5)
I(China)	–0.011	–0.071***	–0.081***	–0.021***	–0.022***
	[0.102]	[0.000]	[0.000]	[0.007]	[0.006]
I(after January)	0.345***	0.185	0.187	0.328**	0.327**
	[0.007]	[0.151]	[0.142]	[0.012]	[0.012]
I(China) × I(after January)	0.029***	0.042***	0.043***	0.024***	0.026***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
ln(assets)	–0.035***	–0.031***	–0.024***	–0.036***	–0.036***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Leverage	0.02	0.022	–0.001	0.062**	0.066***
	[0.424]	[0.466]	[0.959]	[0.011]	[0.009]
CAPEX/assets	0.003	–0.032	–0.034	–0.003	–0.018
	[0.728]	[0.350]	[0.345]	[0.953]	[0.755]
High-tech firm	–0.013	0.016	0.013	–0.012	–0.011
	[0.116]	[0.119]	[0.242]	[0.176]	[0.206]
FCF/assets	0.005	0.016***	0.011*	–0.017	–0.015
	[0.550]	[0.000]	[0.064]	[0.286]	[0.321]
Constant	0.540***	0.347***	0.303**	0.185	0.554***
	[0.000]	[0.009]	[0.022]	[0.162]	[0.000]
Observations	21,416	15,103	14,096	17,698	16,623
R^2	0.139	0.111	0.072	0.141	0.142
F statistic	46.766	26.295	18.895	39.978	38.127

NOTE: This table contains difference-in-difference regression results where the dependent variable is the monthly absolute order imbalance. The column title contains the control sample. The main independent variable of interest is China × After January, the interaction of indicators that equal 1 if (1) the firm lists in mainland China and (2) the observation postdates January 9, 2003. The control samples in Columns 1, 2, and 3 are all companies in Hong Kong, Korea, and Taiwan; Hong Kong and Korea; and just Hong Kong, respectively. The control samples in Columns 4 and 5 are based on the 90 percent and 80 percent propensity score intervals, respectively. The models are OLS regressions and include month dummies and use robust standard errors clustered by firm. Brackets contain *p* values. Superscripts ***, **, and * denote significance at 1 percent, 5 percent, and 10 percent, respectively.

The increase in the measures of informed trade support prior predictions in Bhattacharya and Daouk (2009). They compare a situation where there is no law with a situation where there is a good law that is not enforced. The intuition of their model, as applied to the analysis of false statements, is that if there is no law, then everyone will "deviate" (i.e., many firms will make false statements), in which case corporate disclosures will lack credibility in general. However, if there is a good law that is not enforced, then law-abiding managers will comply but some non-law-abiding managers will take advantage of this compliance and deviate with even greater intensity, knowing that there is no repercussion for doing so and knowing that the increased level of compliance in the market will lend greater credibility to their false disclosures. This separating equilibrium provides greater opportunities and incentives for some traders to become privately informed, thereby increasing the overall level of informed trade. Indeed, the results in this article are consistent with the idea that a strong law that is not enforced is ineffective and can be detrimental.

These results have significant regulatory implications. The key implication is that governments must improve both law and regulation in order to improve the economic environment. This supports calls for significant changes in the regulation of financial markets (see, e.g., Langevoort 2010). In China's particular case, China may benefit from increasing the efficacy of the regulator (the CSRC). Future research could further examine the precise implications of these legal changes for corporate (cf. market) behavior and how to best improve the regulator's powers in order to allow it to implement the law.

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Appendix A: Tests Using Daily Measures of Informed Trade

I also ensure that the results are robust to using a daily measure of informed trade that does not rely on (potentially noisy) microstructure data. The daily informed trade measure is the end of day bid-ask spread (as derived from data in the Thomson Reuters Tick History database). I calculate this as (Bid Price – Ask Price)/((Bid Price + Ask Price)/2), where the

bid and ask prices are as at the close of trade. Because bid-ask spreads do not rely on microstructure data, I have access to a longer sample period (spanning January 2001 to December 2003). I include the same control variables as in the main regressions. The regression model is of the following form:

$$\text{Spread}_{it} = \alpha + \beta I(\text{China})_{it} + \text{I(Treatment)}_{it}\beta_2 + \text{I(China)} \times \text{I(Treatment)}_{it}\beta_3 + \boldsymbol{X}_{it}\boldsymbol{\theta} + \lambda_t + \varepsilon_{it}$$

where the dependent variable is firm i's average relative spread in month t, $I(\text{China})_{it}$ is an indicator that equals 1 if the firm is listed in China, $\text{I(Treatment)}_{it}\beta_2$ is an indicator that equals 1 if the observation postdates the court's decision, $\boldsymbol{X}_{it}$ is a vector of firm-specific controls, and λ_t represents a set of month dummies. The control variables are from Compustat Global and are time varying, being updated each year. The models are OLS models that include month dummies and cluster standard errors by firm. I run the model for the sample sets of control sample as in the main models.

The results are in Table A1. The main finding is that the coefficient on the interaction term is positive and significant in all models. Interestingly, large firms have larger spreads in this sample, potentially suggesting that large firms attract more trading activity, so are more likely to see their spread respond to the presence of informed trade. These results overall are consistent with the main models and support the hypothesis that informed trade increased following the court's interpretation.

Table A1: Relative Spread Regressions

Control Sample	*Hong Kong, Korea, Taiwan* [1]	*Hong Kong, Korea* [2]	*Hong Kong* [3]	*Propensity Score: 90% Interval* [4]	*Propensity Score: 80% Interval* [5]
China	0.024***	0.024***	0.025***	0.022***	0.019***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
After January	0.000	–0.005	–0.005	0.004	0.003
	[0.987]	[0.701]	[0.736]	[0.705]	[0.795]
China × After January	0.002***	0.006***	0.004***	0.003***	0.004***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
ln(assets)	0.007***	0.007***	0.010***	0.007***	0.006***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Leverage	–0.021***	–0.036***	–0.042***	–0.019***	–0.013***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
CAPEX/assets	0.004	0.011***	0.015***	0.004	0.001
	[0.260]	[0.002]	[0.000]	[0.258]	[0.721]
High-tech firm	–0.001	–0.002	–0.001	–0.002	–0.002
	[0.530]	[0.302]	[0.647]	[0.280]	[0.395]
FCF/assets	0.040***	0.043***	0.041***	0.040***	0.031***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
R&D/sales	0.042	–0.164	–0.122	0.587*	1.117
	[0.400]	[0.104]	[0.193]	[0.056]	[0.161]
Intangibles/assets	–0.007	0.009	0.027**	–0.007	–0.024
	[0.442]	[0.351]	[0.015]	[0.580]	[0.127]
Constant	–0.090***	–0.091***	–0.103***	–0.079***	–0.080***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]

Table A1 *Continued*

Control Sample	*Hong Kong, Korea, Taiwan* [1]	*Hong Kong, Korea* [2]	*Hong Kong* [3]	*Propensity Score: 90% Interval* [4]	*Propensity Score: 80% Interval* [5]
Observations	91,862	79,199	75,689	79,493	70,537
R^2	20.00%	22.40%	23.70%	16.30%	11.70%
F statistic	38.506	39.519	38.038	36.096	35.428

NOTE: This table contains difference-in-difference regression results where the dependent variable is the firm's average relative bid-ask spread in a given month. The sample is an unbalanced firm-month panel. The column title contains the control sample. The main independent variable of interest is China × After January', the interaction of indicators that equal 1 if (1) the firm lists in mainland China and (2) the observation postdates January 9, 2003. The control samples in Columns 1, 2, and 3 are all companies in Hong Kong, Korea, and Taiwan; Hong Kong and Korea; and just Hong Kong, respectively. The control samples in Columns 4 and 5 are based on the 90 percent and 80 percent propensity score intervals, respectively. The models are OLS regressions and include month dummies and use robust standard errors clustered by firm. Brackets contain *p* values. Superscripts ***, **, and * denote significance at 1 percent, 5 percent, and 10 percent, respectively.

Appendix B: Additional Robustness Tests

First, I undertake additional tests to match Chinese companies to non-Chinese companies. These tests match based on firm size and leverage. First, I create an asset distribution and leverage distribution for all Chinese companies. Second, I exclude from the analysis any company whose assets is in the top 10 percent or bottom 10 percent of the distribution (and similarly for leverage). The results from these models are in Table B1. The main finding is that the results for PIN and order imbalance are consistent with those in the main models. That is, PIN and order imbalance increase for Chinese companies after the PRC's ruling (and the LSB component insignificantly decreases after the ruling).

Second, the results are largely robust to Bertrand et al. (2004) type modeling. Bertrand et al. (2004) suggest that difference-in-difference measures might be biased in the presence of autocorrelation. They suggest that one way to address this is to divide the sample into preevent and postevent periods (here, the event is the date of the SPC's interpretation), and for each firm, calculate the average of each variable in the preevent and postevent periods. This means that there are only two observations for each firm. Table B3 contains these models. The PIN and order imbalance results are largely consistent with those reported in the main models. The adverse selection component results are weaker and do not hold in all models. Overall, this lends some support to the main results.

Fourth, the results are robust to including time-varying stock characteristics and additional controls. The main models do not include firm-specific stock characteristics because these might be endogenous with the main control variables. Nonetheless, in Table B3 I report OLS regressions that include the following additional controls: the cumulative monthly stock return; the monthly stock return standard deviation; R&D/sales; and intangibles/assets. The main finding is the relevant interaction term, China × After January, is positive and significant in models that examine the most pertinent dependent variables: PIN and order imbalance (although the interaction term is not significant when examining the LSB component). While these results are largely consistent with the main

results, some caution is necessary interpreting them given the potential for endogeneity between the dependent variable and stock-return-specific controls.

Fifth, in untabulated results, I examine Healey et al. (1992) type regressions. The model is of the following form: Informed $\text{Trade}_{\text{After}} = \alpha + \text{Informed Trade}_{\text{Before}}\beta + \text{Controls}\theta + \varepsilon$. The basic idea is that the intercept term represents the change in informed trade over time; a positive intercept indicates an increase in informed trade. I find a positive intercept when I run such models for all three of the informed trade measures. This result supports those reported in the main models.

Sixth, the results are robust to various measures of clustering. The reported results include month dummies and cluster standard errors by firm. The results also hold if I omit the dummies and/or cluster by SIC two-digit, three-digit, or four-digit industry instead.

Table B1: Matching Based on Assets and Leverage

Matching Focus	*Assets*			*Leverage*		
Dependent Variable	*PIN*	*LSB Component*	*Order Imbalance*	*PIN*	*LSB Component*	*Order Imbalance*
Column	*[1]*	*[2]*	*[3]*	*[4]*	*[5]*	*[6]*
China	–0.012**	–0.057***	–0.034***	0.009**	–0.063***	–0.016**
	[0.042]	[0.000]	[0.001]	[0.034]	[0.000]	[0.036]
After January	–0.229***	0.376**	0.405	–0.02	0.033	0.396***
	[0.000]	[0.011]	[0.112]	[0.744]	[0.775]	[0.002]
China × After January	0.019***	–0.009	0.064***	0.012***	–0.002	0.031***
ln(assets)	[0.000]	[0.225]	[0.000]	[0.001]	[0.676]	[0.000]
	–0.014***	–0.046***	–0.041***	–0.002	–0.060***	–0.038***
Leverage	[0.000]	[0.000]	[0.000]	[0.118]	[0.000]	[0.000]
	–0.031	–0.031	–0.005	–0.037	0.001	–0.049
CAPEX/assets	[0.142]	[0.463]	[0.905]	[0.210]	[0.985]	[0.376]
	0.041**	–0.171***	–0.111**	0.004	0.006	0.007
High-tech firm	[0.024]	[0.008]	[0.013]	[0.493]	[0.418]	[0.412]
	–0.012**	–0.014	–0.031***	–0.015***	–0.011	–0.009
FCF/assets	[0.031]	[0.131]	[0.006]	[0.002]	[0.138]	[0.332]
	0.038**	–0.169***	–0.109**	–0.001	0.013**	0.008
Constant	[0.033]	[0.010]	[0.014]	[0.779]	[0.045]	[0.315]
	0.339***	0.765***	0.617***	0.235***	0.861***	0.570***
Observations	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
	11,900	11,866	11,900	17,821	17,722	17,821
R^2	2.50%	7.40%	6.40%	2.30%	28.50%	14.50%
F statistic	1433.626	18.763	22.103	13.722	67.142	40.577

NOTE: This table contains the results of models that match Chinese companies with non-Chinese companies based on size (in Columns 1–3) and leverage (in Columns 4–6). I do this as follows: (1) I create a sample distribution for the assets and leverage of Chinese companies; (2) I exclude all firms whose assets (or leverage) are in the top 10 percent or bottom 10 percent of the distribution. The models are OLS regressions and include month dummies and cluster standard errors by firm. Brackets contain *p* values and superscripts ***, **, and * denote significance at 1 percent, 5 percent, and 10 percent, respectively.

Table B2: Bertrand et al. (2004) Type Regressions

Sample	*All*	*CHN, HKG, KOR*	*CHN, HKG*	*Propensity Score*
Column	*[1]*	*[2]*	*[3]*	*[4]*
Dependent Variable		*PIN*		
China	0.017***	0.005	–0.006	0.010*
	[0.000]	[0.410]	[0.308]	[0.052]
After January	0.000	0.001	–0.005	–0.001
	[0.995]	[0.795]	[0.351]	[0.802]
China × After January	0.010***	0.008	0.014**	0.012***
	[0.008]	[0.132]	[0.019]	[0.006]
ln(assets)	0.001	0.005***	0.012***	0
	[0.661]	[0.000]	[0.000]	[0.967]
Leverage	–0.027**	–0.022	–0.032**	–0.012
	[0.045]	[0.160]	[0.015]	[0.571]
CAPEX/assets	0	0.065**	0.069**	0.081**
	[0.934]	[0.022]	[0.017]	[0.040]
High-tech firm	–0.020***	–0.006	–0.005	–0.015**
	[0.000]	[0.468]	[0.593]	[0.024]
FCF/assets	–0.004	–0.005	–0.011***	0.007
	[0.401]	[0.348]	[0.005]	[0.509]
Constant	0.199***	0.170***	0.134***	0.202***
	[0.000]	[0.000]	[0.000]	[0.000]
Observations	3,226	2,314	2,147	2,592
R^2	3.30%	2.30%	4.50%	2.10%
F statistic	19.863	6.811	11.594	11.858
Dependent Variable	*LSB Component*			
Sample	*All*	*CHN, HKG, KOR*	*CHN, HKG*	*Pscore1*
China	–0.075***	–0.102***	–0.102***	–0.078***
	[0.000]	[0.000]	[0.000]	[0.000]
After January	–0.032***	–0.046***	–0.050***	–0.032***
	[0.000]	[0.000]	[0.000]	[0.000]
China × After January	0.000	0.014*	0.018**	–0.002
	[0.987]	[0.064]	[0.039]	[0.732]
ln(assets)	–0.063***	–0.061***	–0.063***	–0.063***
	[0.000]	[0.000]	[0.000]	[0.000]
Leverage	–0.026	–0.021	–0.026	–0.008
	[0.202]	[0.406]	[0.318]	[0.807]
CAPEX/assets	0.017**	–0.067	–0.072	–0.042
	[0.022]	[0.147]	[0.137]	[0.522]
High-tech firm	–0.006	0.016	0.017	0
	[0.494]	[0.235]	[0.240]	[0.994]
FCF/assets	0.022***	0.031***	0.033***	0.02
	[0.001]	[0.000]	[0.000]	[0.244]
Constant	0.897***	0.913***	0.932***	0.909***
	[0.000]	[0.000]	[0.000]	[0.000]
Observations	3,225	2,313	2,146	2,591
R^2	44.70%	44.70%	39.90%	44.50%
F statistic	169.939	130.586	102.995	139.55

Table B2 *Continued*

Dependent Variable	*Order Imbalance*			
Sample	*All*	*CHN, HKG, KOR*	*CHN, HKG*	*Pscore1*
China	–0.025***	–0.081***	–0.095***	–0.037***
	[0.001]	[0.000]	[0.000]	[0.000]
After January	–0.008	–0.020**	–0.021**	–0.007
	[0.132]	[0.027]	[0.039]	[0.307]
China × After January	0.028***	0.039***	0.040***	0.026***
	[0.000]	[0.000]	[0.000]	[0.000]
ln(assets)	–0.040***	–0.032***	–0.024***	–0.041***
	[0.000]	[0.000]	[0.000]	[0.000]
Leverage	–0.012	–0.008	–0.029	0.051
	[0.732]	[0.839]	[0.345]	[0.151]
CAPEX/assets	0.006	–0.006	–0.004	0.064
	[0.532]	[0.907]	[0.945]	[0.358]
High-tech firm	–0.009	0.022	0.018	–0.008
	[0.383]	[0.126]	[0.239]	[0.494]
FCF/assets	0.01	0.021***	0.013*	–0.003
	[0.207]	[0.002]	[0.080]	[0.870]
Constant	0.573***	0.577***	0.529***	0.587***
	[0.000]	[0.000]	[0.000]	[0.000]
Observations	3,226	2,314	2,147	2,592
R^2	20.90%	19.60%	14.50%	21.70%
F statistic	78.811	34.44	24.982	61.666

NOTE: This table contains models that use a Bertrand et al. (2004) methodology. Here, for each firm, I calculate the average of each variable in (1) the preevent period and (2) the postevent period. Thus, each firm has only two observations in the sample. Column 1 contains all firms in the sample. Column 2 restricts the sample to firms in China, Hong Kong, and Korea. Column 3 examines only China and Hong Kong. Column 4 restricts the sample based on propensity score matching. The models are OLS regressions and use robust standard errors clustered by firm. Brackets contain *p* values and superscripts ***, **, and * denote significance at 1 percent, 5 percent, and 10 percent, respectively.

Table B3: Models with Additional Controls

Dependent Variable	*PIN*				
Control Sample	*Hong Kong, Korea, Taiwan*	*Hong Kong, Korea*	*Hong Kong*	*Propensity Score: 90% Interval*	*Propensity Score: 80% Interval*
Column	*[1]*	*[2]*	*[3]*	*[4]*	*[5]*
I(China)	0.011**	–0.008	–0.017***	–0.001	–0.002
	[0.011]	[0.156]	[0.005]	[0.776]	[0.752]
I(after January)	–0.041	–0.083	–0.085	–0.047	–0.049
	[0.480]	[0.223]	[0.208]	[0.431]	[0.404]
I(China) × I(after January)	0.010***	0.012**	0.018***	0.012***	0.013***
	[0.004]	[0.018]	[0.001]	[0.003]	[0.002]
ln(assets)	–0.001	0.003**	0.007***	–0.002	–0.002
	[0.207]	[0.026]	[0.000]	[0.123]	[0.112]
Monthly return	0.026*	–0.044**	–0.065***	0	0.003
	[0.088]	[0.017]	[0.001]	[0.988]	[0.885]

Table B3 *Continued*

Dependent Variable	*PIN*				
Control Sample	*Hong Kong, Korea, Taiwan*	*Hong Kong, Korea*	*Hong Kong*	*Propensity Score: 90% Interval*	*Propensity Score: 80% Interval*
Column	*[1]*	*[2]*	*[3]*	*[4]*	*[5]*
Return *SD*	0.005	–0.034	0.036	–0.042	–0.027
	[0.971]	[0.802]	[0.804]	[0.756]	[0.850]
Debt/assets	–0.014	–0.01	–0.021	–0.006	–0.007
	[0.312]	[0.537]	[0.194]	[0.722]	[0.689]
CAPEX/assets	0.003	0.050**	0.050**	0.089***	0.095***
	[0.620]	[0.022]	[0.027]	[0.003]	[0.004]
High-tech firm	–0.017***	–0.005	–0.002	–0.012**	–0.012**
	[0.000]	[0.479]	[0.773]	[0.020]	[0.019]
FCF/assets	–0.003	–0.002	–0.005	0.01	0.005
	[0.492]	[0.715]	[0.193]	[0.247]	[0.499]
R&D/sales	–0.013	–0.003	–0.004	–2.018***	–1.998***
	[0.473]	[0.778]	[0.698]	[0.000]	[0.000]
Intangibles/assets	0.074**	0.045	0.05	0.064*	0.068**
	[0.017]	[0.151]	[0.114]	[0.060]	[0.033]
Constant	0.270***	0.211***	0.191***	0.257***	0.234***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Observations	21,410	15,097	14,089	17,692	16,617
R^2	2.50%	1.60%	2.20%	2.40%	2.40%
F statistic	13.814	9.541	11.664	11.97	11.002
Dependent Variable			*LSB Component*		
I(China)	–0.059***	–0.083***	–0.081***	–0.067***	–0.065***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
I(after January)	0.052	0.037	0.032	0.041	0.044
	[0.607]	[0.773]	[0.805]	[0.692]	[0.671]
I(China) × I(after January)	–0.003	0.009	0.012	–0.006	–0.008
	[0.609]	[0.161]	[0.125]	[0.284]	[0.150]
ln(assets)	–0.057***	–0.056***	–0.060***	–0.057***	–0.058***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Monthly return	0.146***	0.109***	0.113***	0.144***	0.152***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Return *SD*	–0.508***	–0.579***	–0.567***	–0.582***	–0.630***
	[0.003]	[0.002]	[0.006]	[0.001]	[0.001]
Debt/assets	–0.026	–0.018	–0.021	–0.036	–0.034
	[0.177]	[0.460]	[0.424]	[0.219]	[0.254]
CAPEX/assets	0.006	–0.062	–0.06	–0.03	–0.041
	[0.486]	[0.121]	[0.143]	[0.600]	[0.514]
High-tech firm	–0.01	0.007	0.009	–0.003	–0.003
	[0.131]	[0.525]	[0.438]	[0.705]	[0.727]
FCF/assets	0.01	0.016***	0.019***	–0.004	0
	[0.135]	[0.000]	[0.000]	[0.832]	[0.990]
R&D/sales	–0.034*	–0.019	–0.02	–2.054***	–2.018***
	[0.090]	[0.327]	[0.259]	[0.001]	[0.002]

Table B3 *Continued*

Dependent Variable	*PIN*				
Control Sample	*Hong Kong, Korea, Taiwan*	*Hong Kong, Korea*	*Hong Kong*	*Propensity Score: 90% Interval*	*Propensity Score: 80% Interval*
Column	*[1]*	*[2]*	*[3]*	*[4]*	*[5]*
Intangibles/assets	–0.065	–0.110**	–0.113**	–0.083*	–0.120***
	[0.110]	[0.012]	[0.013]	[0.060]	[0.006]
Constant	0.760***	0.796***	0.893***	0.862***	0.791***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Observations	21,294	14,987	13,979	17,587	16,518
R^2	29.80%	29.50%	25.40%	30.10%	30.20%
F statistic	75.944	54.961	44.948	68.144	66.485
Dependent Variable			*Order Imbalance*		
I(China)	–0.015**	–0.079***	–0.091***	–0.037***	–0.039***
	[0.038]	[0.000]	[0.000]	[0.000]	[0.000]
I(after January)	0.339***	0.18	0.181	0.319**	0.317**
	[0.008]	[0.163]	[0.156]	[0.014]	[0.015]
I(China) × I(after January)	0.030***	0.049***	0.052***	0.026***	0.029***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
ln(assets)	–0.034***	–0.031***	–0.024***	–0.035***	–0.036***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Monthly return	–0.008	–0.182***	–0.228***	–0.041	–0.03
	[0.764]	[0.000]	[0.000]	[0.142]	[0.295]
Return *SD*	–0.300*	–0.165	0.075	–0.417**	–0.436**
	[0.099]	[0.399]	[0.725]	[0.016]	[0.018]
Debt/assets	0.018	0.023	0	0.039*	0.039
	[0.453]	[0.452]	[0.988]	[0.096]	[0.102]
CAPEX/assets	0.003	–0.033	–0.034	0.054	0.053
	[0.754]	[0.347]	[0.344]	[0.277]	[0.346]
High-tech firm	–0.012	0.016	0.013	–0.004	–0.004
	[0.138]	[0.115]	[0.236]	[0.651]	[0.653]
FCF/assets	0.004	0.016***	0.011*	–0.012	–0.01
	[0.632]	[0.000]	[0.059]	[0.427]	[0.507]
R&D/sales	–0.009	0.016	0.015	–4.776***	–4.762***
	[0.741]	[0.242]	[0.277]	[0.000]	[0.000]
Intangibles/assets	0.160***	0.043	0.041	0.130**	0.141**
	[0.003]	[0.466]	[0.502]	[0.022]	[0.027]
Constant	0.17	0.577***	0.538***	0.195	0.565***
	[0.193]	[0.000]	[0.000]	[0.142]	[0.000]
Observations	21,410	15,097	14,089	17,692	16,617
R^2	14.20%	11.70%	8.00%	15.30%	15.50%
F statistic	40.071	23.221	17.282	38.815	37.118

NOTE: This table contains OLS regressions that add additional controls to the main models. The models include month dummies and cluster standard errors by firm. Brackets contain *p* values and superscripts ***, **, * denote significance at 1 percent, 5 percent, and 10 percent, respectively.