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Accrual components and stock trading costs[☆]

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ABSTRACT

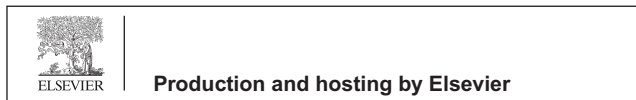
This paper examines the relationship between accrual components and stock trading costs in China and finds that both abnormal and normal accruals are associated with these costs. Moreover, negative accruals, both abnormal and normal, have a greater influence on stock trading costs than positive accruals because of short-selling constraints in the Chinese stock market. Further analysis reveals that investors who are fixated on accruals are unable to separate positive or negative abnormal accruals from earnings in general. Additionally, investors overestimate the persistence of both positive and negative normal accruals. These findings constitute further evidence of the low degree of market efficiency in China. Chinese investors seem to overestimate firm value when abnormal and normal accruals are positive and underestimate it when they are negative, thus leading to an asymmetric effect on trading costs between positive and negative accruals in the face of short-selling constraints in the Chinese stock market.

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1. Introduction

Trading cost savings are conducive to the efficient allocation of capital in economic systems. [Biais et al. \(2005\)](#) argue that the volume of transactions renders the overall economic system non-trivial, although the trading cost involved in each transaction is small. The issue of trading cost savings is particularly significant in China because of its speculative stock market and high stock turnover rate. Such savings are also conducive to investment returns. [Korajczyk and Sadka \(2004\)](#) evaluate the performance of momentum trading

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strategies with proportional transaction costs and find that the return net of effective spread (quoted spread) is 0.0061 (0.0054) in an equal-weighted momentum strategy, about 76.25% (67.50%) of the raw return (0.0080).

The issue of whether the mispricing of accruals is costly to investors is of significant importance to academics, practitioners, and regulators. Accruals provide investors with information on firm value, and their use can alter the timing of cash flow recognition in earnings, thereby mitigating the problem of noisy cash flow measurement and improving the accuracy of firm performance measurement, particularly when the interval of the latter measurement is short, the volatility of the firm's working capital requirements and investment and financing activities is great, and its operating cycle is long (Dechow, 1994). Some evidence suggests that investors have difficulty understanding the real firm value information embedded in accruals (Sloan, 1996; Xie, 2001; Richardson et al., 2005), which can increase stock trading costs because of information asymmetry between informed and uninformed traders.

Several papers discuss the relationship between accrual quality and the bid-ask spread, but few consider that between accrual components and stock trading costs. In addition, there is little research on the effects of normal accruals on stock trading costs or those of short-selling constraints on the relationship between abnormal and normal accruals and these trading costs. Using A-share listed firms on Chinese stock exchanges between 2004 and 2011, this paper empirically examines the relationship between accrual components and stock trading costs in the face of short-selling constraints. The results show that (1) both abnormal and normal accruals are associated with stock trading costs and (2) that negative abnormal and normal accruals have stronger effects on these costs than positive abnormal and normal accruals. This paper contributes to the literature by showing how short-selling constraints affect the relationship between accruals and stock trading costs.

The results of this paper also have several implications for accounting theory. First, accounting is an information and measurement system that identifies, records, and communicates relevant, reliable, and comparable information about an organization's real business activities (Ge, 2003). Many papers investigate the quality of earnings in terms of their relevance, reliability, and comparability, but few document the real accounting goal of reflecting an organization's real business activities. The results reported in this paper indicate that trading costs in the securities market increase if investors cannot understand an organization's real business activities (such as normal accruals). Second, in accrual-based accounting, accruals include numerous subjective judgments and measurement errors. This paper provides empirical evidence showing that investors' estimation of firm value is biased by accrual measurement errors. Third, it also offers empirical evidence to show that the full disclosure suggested by the information perspective, regardless of the disclosure form, is limited under weak-form stock market efficiency. Both the information and measurement perspectives should be considered when examining accounting information.

This paper also has implications for securities regulation. For example, listed firms in China need to strengthen their disclosure quality (e.g., by providing information on measurement methods and fundamental earnings conditions) because of the country's low degree of market efficiency. Doing so will reduce the information asymmetry between informed and uninformed investors and lower stock market trading costs.

The remainder of the paper is organized as follows.: Section 2 reviews the relevant literature. Section 3 presents the relevant background and posits hypotheses on the effects of accrual components on stock trading costs. The research design is discussed in Section 4. Section 5 presents the empirical results. Section 6 reports the results of additional analyses and robustness tests, and Section 7 concludes the paper.

2. Literature review

2.1. Literature on accrual mispricing

A number of studies present evidence to show that investors are naïve and do not use the information available correctly in forecasting future firm performance (e.g., Bernard and Thomas, 1990; Maines and Hand, 1996). Recent studies provide further empirical evidence of investors' naïve fixation on reported earnings by identifying the role of the information in the accrual components of current earnings in future earnings forecasts. This evidence indicates that investors are unable to fully capture the information contained in var-

ious accrual metrics and components (Sloan, 1996; Xie, 2001; Richardson et al., 2005). Sloan (1996) reports an accrual anomaly in the stock market, presenting evidence showing that stock prices place too great a weight on accruals. Drawing on Mishkin (1983) and the hedge-portfolio test methods in Sloan (1996), Xie (2001) finds the market to overestimate the persistence, or one-year-ahead earnings implications, of abnormal accruals, consequently overpricing them. Richardson et al. (2005) extend Sloan (1996) work by linking accrual reliability to earnings persistence. They show that less reliable accruals lead to less earnings persistence and that investors do not fully anticipate this lower degree of persistence, which leads to significant security mispricing. Chan et al. (2006) also investigate the market mispricing of accruals, finding that the mispricing of inventory accruals is most serious of all accrual components. Examining the Chinese stock market, Zhang and Zhao (2008) find that Chinese investors also misprice less reliable accruals. Using the methods of Fama–MacBeth, Song and Li (2009) find that there is also an accrual anomaly in this stock market, although the mispricing of earnings and earnings components are inconsistent with those in the US stock market.

2.2. Literature on accruals and stock trading costs

Accruals contain many subjective judgments, thus leading to information asymmetry between investors and listed firms. Endogenous information acquisition theories hold that the incentives to acquire and exploit private information are inversely related to the informativeness of public information (Grossman and Stiglitz, 1980; Verrecchia, 1982; Diamond, 1985; Baiman and Verrecchia, 1996; Easley and O'Hara, 2004). The relationship between trading costs and accrual components depends on the extent to which accruals contain measurement error and the degree to which investors are unable to correctly interpret the fundamental earnings component.

Only a few papers examine the relationship between accruals and stock trading costs either directly or indirectly. Bhattacharya et al. (2008) demonstrate that poor earnings quality increases adverse selection risk, as manifested in trading costs, and reduces liquidity in financial markets. Both the innate and discretionary components of earnings quality contribute significantly to information asymmetry. Further, poor earnings quality exacerbates information asymmetry around earnings announcements, particularly for firms whose earnings represent the principal source of information available to market participants. Several papers investigate the economic consequences of earnings quality using the bid-ask spread and the price impact as dependent variables. Affleck-Graves et al. (2002), for example, explore the relationship among earnings predictability, information asymmetry, and the behavior of the adverse selection cost component of the bid-ask spread around the quarterly earnings announcements of NASDAQ firms. They find an increase in this component on the day of and day prior to these announcements for firms with less predictable earnings. However, they find no evidence of such a change among firms with more predictable earnings. Jayaraman (2008) reports that bid-ask spreads and the probability of informed trading are higher both when earnings are smoother than cash flows and when they are more volatile than cash flows. His additional tests suggest that managers' discretionary choices lead to smoother or more volatile earnings to a greater extent than cash flows garble information, although their non-discretionary choices do not. Lang et al. (2012) document lower transaction costs and greater liquidity for firms with greater transparency, and find that the transparency–liquidity relationship is more pronounced when overall investor uncertainty is greater.

3. Institutional background and hypothesis development

Dechow et al. (2010) show that reported accrual-based earnings are a function of unobservable fundamental earnings and the accounting measurement error term. Fundamental earnings, alternatively referred to as perpetual earnings, can be thought of as the expected cash flows generated during a period that can be annuitized to obtain the fundamental value of the firm. The error term represents the ability of the accounting system to measure the firm's fundamental earnings process. Similarly, the accrual component of earnings also contains two components: fundamental accruals and error accruals.

Abnormal accruals are an important type of accounting measurement error. Some researchers argue that managers communicate private information using abnormal accruals. Subramanyam (1996), for example, uses the modified Jones model to measure abnormal accruals and finds them to have incremental information con-

tent. He interprets this finding as evidence that abnormal accruals are not opportunistic, but rather communicate private information on equity value. However, most work in this arena reports that managers use abnormal accruals to manage earnings for their own private benefit, thereby increasing the firm's agency costs (Francis et al., 1999) and the degree of information asymmetry between investors. Abnormal accruals in China, in particular, appear to be opportunistic owing to the country's weak investor protection and special institutional arrangements (such as IPOs, SEOs, and ST). Wang and Lian (2010), for example, document significant abnormal accrual increases after China implemented a sponsor system, and Zhang (2010) finds evidence of earnings management before private offerings. He finds that the type of earnings management is related to the type of private offering. Zhang and Hu (2008) report that loss-making firms are more likely to take "a big bath" in fourth-quarter financial statements. Lei and Liu (2007) empirically test the relationship between controlling shareholders' tunneling behavior and negative earnings management when firms experience a loss in their first year. They find that negative earnings management is serious when controlling shareholders occupy funds. Overall, abnormal accruals are opportunistic in China, which garbles information. Investors cannot correctly price obscure abnormal accruals if they are naïve and fixated on earnings (Xie, 2001), thereby leading to severe information asymmetry between informed and uninformed investors.

However, the accrual anomaly identified by Sloan (1996) cannot be explained by the mispricing of abnormal accruals alone. Normal accruals (non-discretionary accruals) can also be mispriced (Thomas and Zhang, 2002; Bradshaw et al., 2001). Chan et al. (2006) highlights two possible interpretations of the mispricing of normal accruals. First, the psychology perspective suggests that individuals extrapolate past trends from short histories too far into the future (Shleifer, 2000). For example, analysts and investors tend to weigh past growth too heavily in their forecasts and valuations (e.g., De Bondt and Thaler, 1990; Chan et al., 2003). Normal accruals (non-discretionary accruals) capture the influence of business conditions (Chan et al., 2006) and reflect changes in firms' net assets (Fairfield et al., 2003; Zhang, 2007). A high (low) level of normal accruals may be a reflection of strong (weak) past sales growth and investors wrongly infer that such high (low) growth trends will last for a long time. Second, the behavioral finance perspective suggests that individuals may be too slow in updating their beliefs when new evidence arrives (Edwards, 1968). A high level of normal accruals makes a firm look good even when it is facing difficulties in its operating conditions. If investors cannot extrapolate a firm's operating conditions from the components of accruals, such as changes in inventories, receivables, and payables, then the mispricing of normal accruals is likely to occur.

If investors are naïve and fixated on earnings, they generally cannot understand the real value or relevance of the information embedded in accrual components (whether abnormal or normal). However, not all investors are naïve. Some are able to acquire information before others and grasp the implications of public news (Lakonishok et al., 1992; Hand, 1990). For example, institutional investors are more sophisticated than individual investors and have a stronger capacity to acquire and process information (Grinblatt and Titman, 1989; Nofsinger and Sias, 1999; Wermers, 2000). Therefore, these informed investors are likely to be able to correctly price abnormal and normal accruals, thus leading to information asymmetry with their less sophisticated counterparts. This informed trading by informed investors increases stock trading costs.

A high absolute value of abnormal accruals generally means high levels of earnings management and information asymmetry, which lead to high trading costs. Similarly, a high absolute value of normal accruals generally means that firms are experiencing a high or low rate of growth, which renders it easy for investors to misestimate the tendency of earnings performance to reverse.

Accordingly, the first set of hypotheses are as follows.

H1a. A higher absolute value of abnormal accruals is associated with a higher stock trading cost.

H1b. A higher absolute value of normal accruals is associated with a higher stock trading cost.

Contrary to the case in the US, short-selling is constrained in the Chinese stock market. Informed investors may thus engage in different forms of arbitrage depending on whether firm value is underestimated or overestimated. When it is underestimated, these investors can benefit from buying the firm's stocks. When it is overestimated, in contrast, they are unable to benefit from short-selling in the Chinese stock market because of short-selling constraints (Jin, 2010). Hence, more informed trading takes place when firm value is underestimated, which leads to higher stock trading costs.

The sign of abnormal accruals can be positive or negative because managers can manage earnings upward or downward. Informed investors in China are unable to benefit from positive abnormal accruals because of short-selling constraints, thus leading to less active informed trading. The stock trading costs incurred by adverse selection risk are low in this case. However, when abnormal accruals are negative, firm value is underestimated. Informed investors can benefit from buying these firms' stocks, which leads to losses for uninformed investors.

Similarly, there are positive and negative normal accruals. Firm may be enjoying sales growth when normal accruals are positive, meaning that investors may overestimate the persistence of that growth and, accordingly, overestimate firm value (Chan et al., 2006). When these accruals are negative, in contrast, firms may be experiencing weak sales growth, meaning that investors may overestimate the persistence of such weak growth and, accordingly, underestimate firm value. Hence, negative normal accruals attract more informed trading, leading to higher stock trading costs.

The second set of hypotheses are as follows.

H2a. In the short- selling-constrained Chinese stock market, negative abnormal accruals have a greater influence on stock trading costs than positive abnormal accruals.

H2b. In the short- selling-constrained Chinese stock market, negative normal accruals have a greater influence on stock trading costs than positive normal accruals.

4. Sample selection and research design

4.1. Sample selection

The initial sample comprises all A-share firms listed on the Shanghai and Shenzhen Stock Exchanges from 2004 to 2008 according to data from the China Stock Market and Accounting Research (CSMAR) database. The sample initially included 1746 firms and 7295 observations. After eliminating 87 financial industry observations, 370 IPO observations, and 358 observations with missing variables, the final sample contains 6480 firm-year observations. Following Jiang et al. (2010), all variables are winsorized at the 1% and 99% levels.

The stock return data in this paper are from the CSMAR database. Financial data are from the CSMAR and WIND databases, and high-frequency data from the China Center for Economic Research (CCER) database.

4.2. Measurement of trading costs

Trading costs constitute one measure of liquidity. If brokerage fees and transfer taxes are excluded, there are two kinds of trading costs (Korajczyk and Sadka, 2004): proportional (quoted and effective spreads) and non-proportional (price impact). Proportional trading costs are independent of the size of the portfolio traded, whereas non-proportional costs increase with the size of the portfolio.

Spreads are a more suitable measure of trading costs in the Chinese context because of the country's low degree of institutional ownership. Most trades are initiated by individual investors and are small in scale. Zhang and Liu (2006) argue that spreads can be a direct measure of trading costs when investors make small trades, although both the Shenzhen and Shanghai Stock Exchanges are electronic, order-driven exchanges. He and Niu (2009) also suggest that spreads are a typical metric of trading costs, which affect investors' investment returns. This paper therefore uses quoted and effective spreads to measure trading costs in the Chinese stock market. High-frequency data are used to construct these spreads, as follows.

$$QSP_i = \frac{1}{D_i} \sum_{d=1}^D \frac{1}{T} \sum_{t=1}^T \frac{Ask_{i,t} - Bid_{i,t}}{(Ask_{i,t} + Bid_{i,t})/2} \quad (1)$$

$$ESP_i = \frac{1}{D_i} \sum_{d=1}^D \frac{1}{T} \sum_{t=1}^T 2 \times \frac{|Price_{i,t} - (Ask_{i,t} + Bid_{i,t})/2|}{(Ask_{i,t} + Bid_{i,t})/2} \quad (2)$$

where D_i is the number of trading days in the year for stock i ; $Bid_{i,t}$ is the highest bid price for stock i at time t ; $Ask_{i,t}$ is the lowest ask price for stock i at time t ; T is the number of transactions in a day for stock i ; and $Price_{i,t}$ is the price of stock i at time t .

The daily spread is first calculated as the average intraday spread. QSP and ESP are the averages of the daily spreads (quoted and effective spreads) by year. To compute the quoted and effective spreads more effectively and accurately, high-frequency data are first selected according to several Chinese institutional features: (1) trades in the call auction period are excluded because of the different character of call and continuous auctions and (2) trades that hit up or down limits are excluded because the spreads of these trades are abnormal, and (3) trades that seem to be incorrectly recorded, such as those for which the highest bid price is larger than the lowest ask price or for which the lowest ask price is negative, are excluded.

Moreover, financial reporting for year t must be provided before April 30 of the next year in China. Therefore, trades made between May 1 of year t and April 30 of year $t + 1$ are used to calculate the spreads for year t .

4.3. Measurement of abnormal and normal accruals

Dechow et al. (1995) find the modified Jones model to exhibit the greatest power in detecting earnings management. This model is thus used to obtain abnormal and normal accruals in this paper. Model (3) is estimated for each year-industry in the sample, and the abnormal accruals in model (4) are then calculated for each firm-year in the sample using the coefficients estimated in model (3).

$$\frac{TA_{i,t}}{Asset_{i,t-1}} = a_1 \frac{1}{Asset_{i,t-1}} + a_2 \frac{\Delta REV_{i,t}}{Asset_{i,t-1}} + a_3 \frac{PPE_{i,t}}{Asset_{i,t-1}} + \varepsilon_{i,t} \quad (3)$$

$$Abacc_{i,t} = \frac{TA_{i,t}}{Asset_{i,t-1}} - \left(a_1 \frac{1}{Asset_{i,t-1}} + a_2 \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{Asset_{i,t-1}} + a_3 \frac{PPE_{i,t}}{Asset_{i,t-1}} + \varepsilon_{i,t} \right) \quad (4)$$

In models (3) and (4), TA is total accruals, which equal operating profits minus operating cash flow, $Asset$ is total assets, ΔREV is changes in sales, ΔREC is changes in receivables, and PPE is gross fixed assets.

4.4. Regression models

The following multivariate regressions are used to test the hypotheses.

$$Tradingcost = \beta_0 + \beta_1 Accrual + \beta_2 Size + \beta_3 Price + \beta_4 Volatility + \beta_5 Volume + \beta_6 State + Year + Industry + \varepsilon \quad (5)$$

$$Tradingcost = \beta_0 + \beta_1 |abacc| + \beta_2 Dum1 + \beta_3 |abacc| * Dum1 + \beta_4 Size + \beta_5 Price + \beta_6 Volatility + \beta_7 Volume + \beta_8 State + Year + Industry + \varepsilon \quad (6)$$

$$Tradingcost = \beta_0 + \beta_1 |noracc| + \beta_2 Dum2 + \beta_3 |noracc| * Dum2 + \beta_4 Size + \beta_5 Price + \beta_6 Volatility + \beta_7 Volume + \beta_8 State + Year + Industry + \varepsilon \quad (7)$$

In the regressions, $Tradingcost$ is the stock trading cost, which equals the natural logarithm of QSP and ESP ; $Accrual$ is the components of accruals, which is equal to the absolute value of abnormal accruals ($|abacc|$) or normal accruals ($|noracc|$). On the basis of the foregoing analysis, the sign of $Accrual$ is predicted to be positive in Eq. (5). Eqs. (6) and (7) examine the influence of short-selling constraints in the Chinese stock market on the relationship between accrual components and stock trading costs. $Dum1$ and $Dum2$ are dummy variables. When $abacc$ is negative, $Dum1$ is 1, and otherwise 0. Similarly, when $noracc$ is negative, $Dum2$ is 1, and otherwise 0. As previously noted, when normal and abnormal accruals are positive, there is little informed trading by investors because of short-selling constraints. When they are negative, in contrast, more informed trading takes place. Therefore, negative abnormal and normal accruals exert a greater influence on stock trading costs than positive abnormal accruals. Thus, the coefficients on $|abacc| * Dum1$ and $|noracc| * Dum2$ are expected to be positive.

Table 1
Variable definitions.

<i>Dependent variable</i>	
<i>Tradingcost</i>	Stock trading cost = natural logarithm of QSP and ESP, which are calculated according to Eqs. (1) and (2)
<i>Independent variables</i>	
<i>Abacc</i>	Abnormal accruals, calculated according to Eq. (4)
<i>abacc</i>	The absolute value of abnormal accruals.
<i>Noracc</i>	Normal accruals, calculated according to Eq. (3)
<i>noracc</i>	The absolute value of normal accruals
<i>Dum1</i>	Dummy variable; when <i>abacc</i> is negative, <i>Dum1</i> is 1, otherwise 0
<i>Dum2</i>	Dummy variable; when <i>noracc</i> is negative, <i>Dum2</i> is 1, otherwise 0
<i>Control variables</i>	
<i>Size</i>	Firm size = natural logarithm of total assets
<i>Price</i>	Stock price = average stock price in the year
<i>Volatility</i>	Return volatility = standard deviation of stock returns in the year
<i>Volume</i>	Stock trading volume = natural logarithm of average trading volume in the year
<i>State</i>	Dummy variable; when the firm is state-owned, <i>State</i> is 1, otherwise 0
<i>Year</i>	Year fixed effects
<i>Industry</i>	Industry fixed effects

Prior research (e.g., Lang and Lundholm, 1993) shows a positive relationship between firm size and disclosure. Large firms attract more analysts than their smaller counterparts. Larger firms also feature a higher degree of information transparency, less severe information asymmetry, and lower trading costs. The coefficient on *Size* is therefore expected to be negative. Venkatesh and Chiang (1986) document more severe information asymmetry in firms with a low stock price than in those with a high stock price. Hence, the coefficient of *Price* is expected to be negative. Moreover, firms with greater volatility face a higher market risk (Kanagaretnam et al., 2007), suggesting a positive coefficient for *Volatility*. Firms with a large trading volume have a higher level of liquidity, and thus, the predicted coefficient of *Volume* is negative. The dummy variable *State* is included to capture the difference in properties between state-owned enterprises (SOEs) and non-SOEs in China. Year and industry fixed effects are also included in the multivariate regressions.

Table 1 is the variable definitions.

5. Empirical results

Table 2 presents the summary statistics of the variables. QSP and ESP are about 0.3% in China, similar to the values calculated by Chung et al. (2010), who report an average quoted spread (effective spread) of 0.36% (0.26%) for their NYSE/AMEX sample and 2.17% (1.54%) for their NASDAQ sample. The spreads in China are much lower than those in the NASDAQ stock market, suggesting that they are lower in an order-driven

Table 2
Summary statistics.

Variables	<i>N</i>	Mean	Median	Std.	Min	Max	p25	p75
QSP	6480	0.0028	0.0026	0.0011	0.0010	0.0067	0.0019	0.0033
ESP	6480	0.0028	0.0027	0.0011	0.0011	0.0069	0.0020	0.0033
<i>Abacc</i>	6480	−0.0060	−0.0008	0.1080	−0.4081	0.3375	−0.0517	0.0460
<i>abacc</i>	6480	0.0742	0.0488	0.0788	0.0000	0.4081	0.0216	0.0964
<i>Noracc</i>	6480	−0.0151	−0.0220	0.0720	−0.1874	0.4363	−0.0459	0.0014
<i>noracc</i>	6480	0.0449	0.0311	0.0583	0.0000	0.4363	0.0141	0.0544
<i>Size</i>	6480	21.3690	21.2917	1.0757	18.8266	24.6572	20.6479	22.0085
<i>Price</i>	6480	9.0480	6.9313	7.0346	2.1112	42.7328	4.7560	10.6374
<i>Volatility</i>	6480	0.0340	0.0327	0.0096	0.0164	0.0575	0.0261	0.0417
<i>Volume</i>	6480	14.8160	14.8097	1.0788	12.3699	17.4565	14.0146	15.5902
<i>State</i>	6480	0.6662	1.0000	0.4716	0.0000	1.0000	0.0000	1.0000

market than in a quote-driven market. The mean (variance) of $|abacc|$ is 0.0742 (0.0788), and its maximum and minimum values are 0.4081 and 0.0000, respectively, suggesting that the sample firms have very different levels of earnings management. The sign of the mean of abnormal accruals, $abacc$, is negative, which suggests that downward earnings management is widespread among Chinese listed firms.

The summary results for the control variables are as follows: The mean of stock price is 9.0480, which is far less than that in the US. The mean of stock volatility is 0.0340, which is higher than that among NYSE/AMEX firms (0.0239) but lower than that among NASDAQ firms (0.0460) (Chung et al., 2010). The reason for the discrepancy may be the entrepreneurial nature of many firms listed on the NASDAQ, as such firms face higher risks. The mean of *State* is 0.6662, suggesting that more than half the sample firms are state-owned.

Table 3 presents the Pearson (bottom)/Spearman (top) correlations between variables. The Pearson correlation between spreads and the absolute value of abnormal accruals is significantly positive at the 1% level. The Spearman correlation between spreads and the absolute value of normal accruals is also significantly positive at the 1% level. The correlations between spreads and *Size*, *Price* and *Volume* are negative, which is consistent with expectations. Surprisingly, however, those between spreads and *Volatility* are negative, contrary to expectations.

Table 4 presents the results of a grouping test. Sample firms are considered high absolute value firms if their absolute value of normal (abnormal) accruals are higher than the median, and otherwise as low absolute value firms. The trading costs between the high and low absolute value subsamples are then compared. Consistent with expectations, QSP and ESP are significantly higher in the former, as shown in Table 4.

Table 5 presents the results of the regressions of abnormal and normal accruals on trading costs. The coefficients on $|abacc|$ and $|noracc|$ are significantly positive at the 1% level, which suggests that both abnormal and normal accruals increase spreads in the Chinese stock market. Among the control variables, the coefficients on *Size* are significantly negative, consistent with expectations, indicating that larger firms have less information asymmetry and lower spreads. Those on *Price* are also significantly negative, also consistent with expectations, which suggests that firms with a higher stock price have less information asymmetry and lower spreads. The coefficients on *Volume*, too, are significantly negative, suggesting that a higher trading volume can reduce spreads. Interestingly, and contrary to expectations, the coefficients on *Volatility* are negative, perhaps because investors are able to obtain more information from highly volatile firms.

Table 3
Pearson (bottom)/spearman (top) correlations between variables.

Variables	QSP	ESP	$ abacc $	$ noracc $	Size	Price	Volatility	Volume	State
<i>QSP</i>	1	0.9861 (<0.001)	0.0156 (0.209)	0.0559 (<0.001)	-0.4356 (<0.001)	-0.6202 (<0.001)	-0.4047 (<0.001)	-0.6416 (<0.001)	-0.0828 (<0.001)
<i>ESP</i>	0.9720 (<0.001)	1	0.0225 (0.070)	0.0560 (<0.001)	-0.4339 (<0.001)	-0.6089 (<0.001)	-0.3534 (<0.001)	-0.5959 (<0.001)	-0.0843 (<0.001)
$ abacc $	0.0491 (<0.001)	0.0568 (<0.001)	1	0.148 (<0.001)	-0.0666 (<0.001)	0.0412 (<0.001)	0.119 (<0.001)	0.0266 (0.032)	-0.0816 (<0.001)
$ noracc $	0.0134 (0.281)	0.0203 (0.103)	0.4314 (<0.001)	1	0.0713 (<0.001)	-0.1297 (<0.001)	0.0193 (0.121)	0.0551 (<0.001)	0.029 (0.019)
<i>Size</i>	-0.4485 (<0.001)	-0.4387 (<0.001)	-0.0672 (<0.001)	0.0519 (<0.001)	1	0.1895 (<0.001)	-0.0124 (0.319)	0.466 (<0.001)	0.2677 (<0.001)
<i>Price</i>	-0.4183 (<0.001)	-0.4021 (<0.001)	0.0677 (<0.001)	-0.0284 (0.022)	0.2256 (<0.001)	1	0.4182 (<0.001)	0.1599 (<0.001)	-0.0209 (0.093)
<i>Volatility</i>	-0.3732 (<0.001)	-0.3209 (<0.001)	0.1446 (<0.001)	0.1349 (<0.001)	-0.0081 (0.513)	0.3257 (<0.001)	1	0.5431 (<0.001)	-0.0797 (<0.001)
<i>Volume</i>	-0.6174 (<0.001)	-0.5606 (<0.001)	0.0287 (0.021)	0.0784 (<0.001)	0.5007 (<0.001)	0.0901 (<0.001)	0.5179 (<0.001)	1	0.0857 (<0.001)
<i>State</i>	-0.0867 (<0.001)	-0.086 (<0.001)	-0.0947 (<0.001)	-0.0302 (0.015)	0.2747 (<0.001)	-0.0194 (0.118)	-0.0779 (<0.001)	0.0929 (<0.001)	1

Table 4
Grouping test results.

	High	Low	Difference (<i>t</i> -test)
<i>Panel A: grouping according to abacc </i>			
<i>QSP</i>	0.0027823	0.0027326	0.0000497*
<i>ESP</i>	0.0028372	0.0027821	0.000055**
<i>N</i>	3240	3240	
<i>Panel B: grouping according to noracc </i>			
<i>QSP</i>	0.0028017	0.0027132	0.0000885***
<i>ESP</i>	0.0028473	0.0027719	0.0000754***
<i>N</i>	3240	3240	

*** Indicate significance at the 1% level.

** Indicate significance at the 5% level.

* Indicate significance at the 10% level.

Table 5
Regressions of abnormal and normal accruals on stock trading costs.

Variables	lnQSP	lnQSP	lnQSP	lnESP	lnESP	lnESP
<i> abacc </i>	0.3240*** (7.85)		0.2660*** (5.98)	0.3210*** (7.79)		0.2670*** (5.95)
<i> noracc </i>		0.3590*** (6.84)	0.2200*** (3.89)		0.3460*** (6.80)	0.2070*** (3.73)
<i>Size</i>	-0.0476*** (-10.48)	-0.0508*** (-11.13)	-0.0486*** (-10.66)	-0.0441*** (-9.68)	-0.0473*** (-10.31)	-0.0451*** (-9.85)
<i>Price</i>	-0.0217*** (-27.02)	-0.0212*** (-26.48)	-0.0215*** (-26.76)	-0.0208*** (-26.87)	-0.0204*** (-26.30)	-0.0207*** (-26.59)
<i>Volatility</i>	-2.2740*** (-3.43)	-2.0450*** (-3.08)	-2.3050*** (-3.48)	-1.2690* (-1.93)	-1.038 (-1.57)	-1.2990** (-1.99)
<i>Volume</i>	-0.1730*** (-28.62)	-0.1710*** (-28.31)	-0.1720*** (-28.53)	-0.1580*** (-26.59)	-0.1560*** (-26.29)	-0.1570*** (-26.51)
<i>State</i>	-0.0044 (-0.65)	-0.0059 (-0.90)	-0.0043 (-0.65)	-0.0011 (-0.60)	-0.0027 (-0.40)	-0.0010 (-0.15)
<i>Year</i>	Control	Control	Control	Control	Control	Control
<i>Industry</i>	Control	Control	Control	Control	Control	Control
<i>Constant</i>	-2.1360*** (-26.93)	-2.0800*** (-26.14)	-2.1210*** (-26.63)	-2.4640*** (-31.10)	-2.4090*** (-30.27)	-2.4500*** (-30.78)
<i>N</i>	6480	6480	6480	6480	6480	6480
<i>Adj_R2</i>	0.642	0.641	0.643	0.575	0.573	0.575
<i>F</i>	518.4	513.1	496.9	350.5	345.8	335.4

The *t*-values in parentheses are based on White's (1980) adjustment for heteroskedasticity.

*** Denote statistical significance at the 1% level.

** Denote statistical significance at the 5% level.

* Denote statistical significance at the 10% level.

As previously discussed, investors overestimate firm value when abnormal and normal accruals are positive. Stock trading costs are less influenced by positive accruals because informed investors cannot benefit from short-selling in China. When abnormal and normal accruals are negative, in contrast, investors underestimate firm value, meaning that informed investors are likely to buy stock. In this case, uninformed investors face an adverse selection risk. Spreads are increased to protect them, thus leading to higher trading costs. Table 6 presents empirical evidence to support this argument. For the sake of brevity, QSP (in log) is used as the dependent variable in these regression models, although the conclusions are the same when the dependent variable is ESP (in log). Models (1) and (4) in Table 6 are regressions of negative abnormal and normal accruals on stock trading costs. The coefficients on both *|abacc|* and *|noracc|* are positive. Models (2) and (5) are regressions of positive abnormal and normal accruals on stock trading costs. The coefficient on *|abacc|* is not significant, whereas that on *|noracc|* is significantly positive. Models (3) and (6) are regressions with the interaction vari-

Table 6
Regressions of short-selling constraints on the relationship between accruals and stock trading costs.

Variables	(1) lnQSP	(2) lnQSP	(3) lnQSP	(4) lnQSP	(5) lnQSP	(6) lnQSP
$ abacc $	0.5350 ^{***} (10.03)	−0.0905 (−1.44)	0.0051 (0.08)			
$Dum1$			0.0257 ^{***} (3.17)			
$ abacc * Dum1$			0.4930 ^{***} (6.18)			
$ noracc $				0.7180 ^{***} (6.56)	0.2450 ^{***} (3.71)	0.2070 ^{***} (3.79)
$Dum2$						−0.0213 ^{**} (−2.46)
$ noracc * Dum2$						0.6010 ^{***} (5.13)
$Size$	−0.0637 ^{***} (−10.26)	−0.0276 ^{***} (−4.28)	−0.0477 ^{***} (−10.67)	−0.0439 ^{***} (−8.13)	−0.0539 ^{***} (−6.64)	−0.0503 ^{***} (−11.01)
$Price$	−0.0218 ^{***} (−14.13)	−0.0202 ^{***} (−22.08)	−0.0204 ^{***} (−25.44)	−0.0268 ^{***} (−20.99)	−0.0153 ^{***} (−16.15)	−0.0211 ^{***} (−26.23)
$Volatility$	−3.9440 ^{***} (−4.35)	−1.3050 (−1.35)	−2.7000 ^{**} (−4.12)	−1.0500 (−1.30)	−2.2350 [*] (−1.82)	−1.9370 ^{***} (−2.92)
$Volume$	−0.1510 ^{***} (−18.34)	−0.1960 ^{***} (−22.79)	−0.1710 ^{***} (−28.71)	−0.1610 ^{***} (−22.46)	−0.2120 ^{***} (−20.80)	−0.1720 ^{***} (−28.32)
$State$	0.0028 (0.31)	−0.0101 (−1.08)	−0.0046 (−0.70)	−0.0102 (−1.30)	0.0054 (0.46)	−0.0064 (−0.97)
$Year$	Control	Control	Control	Control	Control	Control
$Industry$	Control	Control	Control	Control	Control	Control
$Constant$	−2.0690 ^{***} (−18.83)	−2.2520 ^{***} (−20.94)	−2.1640 ^{***} (−27.75)	−2.3560 ^{***} (−25.00)	−1.5100 ^{***} (−10.55)	−2.0790 ^{***} (−26.11)
N	3262	3218	6480	4794	1686	6480
Adj_R2	0.658	0.645	0.65	0.621	0.709	0.642
F	283.3	272.7	495.5	325.4	201.9	471.9

The t -values within parentheses are based on White's (1980) adjustment for heteroskedasticity.

*** Denote statistical significance at the 1% level.

** Denote statistical significance at the 5% level.

* Denote statistical significance at the 10% level.

ables included. The coefficients on $|abacc| * Dum1$ and $|noracc| * Dum2$ are significantly positive at the 1% level, suggesting that negative accruals have a greater effect on trading costs than positive accruals. Interestingly, the coefficient on $|abacc|$ is not significant in Model (2), whereas that on $|noracc|$ is significantly positive in Model (5). A possible explanation is that some investors understand the value relevance of positive normal accruals and thus sell these stocks, leading to an increase in both information asymmetry and spreads. However, few investors understand the value relevance of positive abnormal accruals, thus the degree of information asymmetry between investors is low, and there is no significant change in spreads when these accruals increase.

6. Additional tests and robustness tests

6.1. Additional tests of Chinese stock market efficiency

As previously discussed, a low degree of market efficiency can lead to the mispricing of positive and negative abnormal accruals. If investors are naïve and fixated on earnings, they are likely to overestimate earnings with positive abnormal accruals and underestimate earnings with negative abnormal accruals. In this section, the results of market efficiency tests that distinguish positive or negative abnormal accruals from earnings in the Chinese stock market are reported. The full sample is split into two groups according to whether firms' abnormal accruals are negative or not. Each group is sorted by accounting earnings and decomposed into

30 small groups of equal size. In each of these 30 small groups, the observations are sorted by abnormal accruals and then split into two groups of the same size to ensure that there are no significant differences in earnings between the two groups but a significant difference in abnormal accruals. If no significant difference in market returns is found between the two groups, the implication is that investors in China are naïve, fixated on earnings, and unable to distinguish abnormal accruals from earnings. Table 7 presents the empirical results. Most of the t -values are insignificant, suggesting a low degree of market efficiency in China. The country's investors cannot distinguish abnormal accruals from earnings.

Weak market efficiency may also be associated with the mispricing of positive and negative normal accruals. Firms may be undergoing a growth period when these accruals are positive and investors may optimistically believe that the high rate of growth will last for a long time (Chan et al., 2006), leading to overestimation of firm value. Similarly, firms may be in financial difficulty when normal accruals are negative and investors may pessimistically believe that the difficulty will persist, leading to underestimation of firm value. Following Sloan (1996), the rational expectations model is used to test whether stock prices reflect the information on future earnings contained in positive and negative normal accruals. More specifically, Eqs. (8) and (9) are used to test the market mispricing of the persistence of positive and negative normal accruals. $Earnings_{t+1}$ is operating earnings in $t + 1$. $Cash$ is operating cash flow in year t . $Noracc^+ = Noracc$ if $Noracc > 0$, otherwise 0. $Noracc^- = Noracc$ if $Noracc < 0$, otherwise 0. AR_{t+1} is the buy- and-hold return from May 1 in year $t + 1$ to April 30 in year $t + 2$. If

Table 7
Market efficiency test distinguishing negative or positive abnormal accruals from earnings.

	$Abacc < 0$			$Abacc \geq 0$		
	Bhar		t -value	Bhar		t -value
	Low	High		Low	High	
group1	-0.2379	-0.2379	-0.79	0.0156	-0.1341	1.08
group2	-0.0889	-0.0195	-0.64	0.0867	-0.0637	1.05
group3	0.1427	0.1870	-0.25	0.1831	-0.0578	1.88*
group4	-0.0791	-0.1613	0.83	0.0158	0.1073	-0.71
group5	-0.0206	-0.0646	0.40	0.0908	0.2773	-1.17
group6	0.2218	-0.1005	2.57**	0.1819	0.0796	0.70
group7	0.0491	0.0075	0.35	0.1099	0.0393	0.53
group8	-0.1098	0.2307	-2.35**	0.0959	-0.0195	0.84
group9	0.1540	0.1878	-0.24	0.0733	-0.0472	0.96
group10	0.1008	0.1410	-0.29	0.0915	0.0822	0.07
group11	0.0659	-0.0378	0.89	0.0094	0.0335	-0.18
group12	0.0878	0.0564	0.24	0.0367	0.0916	-0.40
group13	0.3424	0.0350	1.81*	0.1729	-0.0578	2.10**
group14	-0.0675	0.0578	-1.13	-0.1072	0.1802	-2.25**
group15	0.1065	0.0552	0.42	0.1740	-0.1069	2.73***
group16	0.1162	0.1157	0.00	0.0351	0.2751	-1.70*
group17	0.4071	0.0870	1.79*	-0.0935	0.0813	-1.67*
group18	-0.0035	0.0950	-0.81	0.0554	0.1269	-0.58
group19	0.1743	0.1918	-0.14	-0.0304	0.0631	-0.78
group20	0.1724	0.1096	0.42	0.0838	-0.0532	1.08
group21	0.1145	-0.0117	1.11	0.1499	-0.0127	1.32
group22	-0.0080	-0.0469	0.35	0.1906	0.0600	0.89
group23	-0.0556	0.0470	-1.02	-0.0689	0.1524	-1.84*
group24	0.0489	0.1770	-1.17	0.0052	0.0681	-0.61
group25	0.1462	0.1203	0.21	0.0807	-0.0802	1.51
group26	0.1762	0.0367	1.07	-0.0031	0.2241	-1.80*
group27	0.1479	0.0988	0.37	0.1130	0.1403	-0.19
group28	0.1893	0.2098	-0.17	0.2623	0.3429	-0.43
group29	0.3696	0.0870	2.16**	0.0658	0.0523	0.11
group30	0.3256	0.1640	1.08	0.3044	0.2781	0.17

*** Denote statistical significance at the 1% level.

** Denote statistical significance at the 5% level.

* Denote statistical significance at the 10% level.

market efficiency is weak, investors cannot correctly price positive normal accruals, in which case β_3^* differs significantly from β_3 , and β_4^* differs significantly from β_4 . Investors overestimate the persistence of a firm’s growth and sluggishness if β_3^* is significantly greater than β_3 and β_4^* is significantly greater than β_4 .

$$Earnings_{t+1} = \beta_0 + \beta_1 Cash + \beta_2 Abacc + \beta_3 Noracc^+ + \beta_4 Noracc^- + \varepsilon \tag{8}$$

$$AR_{t+1} = \beta(Earnings_{t+1} - \beta_0^* - \beta_1^* Cash - \beta_2^* Abacc - \beta_3^* Noracc^+ - \beta_4^* Noracc^-) + \mu \tag{9}$$

Table 8 presents the results of the estimation of the market pricing of positive and negative normal accruals with respect to their implications for one-year-ahead earnings. Coefficient β_3^* is 1.2385, significantly greater than β_3 , which is 0.5295, suggesting that investors overestimate the persistence of positive normal accruals. Similarly, coefficient β_4^* is 0.9346, significantly greater than β_4 , which is 0.4876, suggesting that investors overestimate the persistence of negative normal accruals. Overall, investors overestimate the persistence of a firm’s current operating conditions, thus leading to the mispricing of normal accruals.

6.2. Robustness tests

6.2.1. Results based on non-proportional trading costs (the price effect)

The empirical results reported thus far are based on proportional trading costs (quoted and effective spreads). As a robustness test, the relationship between accruals and non-proportional trading costs (the price effect) are also investigated. Following Amihud (2002) and Hasbrouck (2009), an illiquidity measure is used to estimate the price effect of trades:

$$Priceimpact = \frac{1}{D} \sum_{d=1}^D \sqrt{\frac{|R_d|}{RMBVOL_d}} \times 10^6 \tag{10}$$

D is the sum of days with nonzero volume from May 1 of year t to April 30 of year t + 1. R and RMBVOL are the return and trading amount, respectively, on days with nonzero volume. A higher Priceimpact implies higher non-proportional trading costs. The foregoing regressions are run again using Priceimpact as the dependent variable, but the conclusions remain unchanged.

6.2.2. Robust test following Bhattacharya et al. (2008)

Bhattacharya et al. (2008) investigate the relationship between earnings quality and trading costs using a sample of US firms. They measure earnings quality with the modified Dechow and Dichev (2002) model used in Francis et al. (2005), and find that poor earnings quality increases adverse selection risk, as manifested in trading costs, and reduces liquidity in financial markets. In a second robustness test, the methodology of Bhattacharya et al. (2008) is used and the same conclusions are reached for the Chinese firms in the sample. Moreover, following Dechow and Dichev (2002), Francis et al. (2004) and Lang et al. (2012), further firm intrinsic (innate) factors are controlled for in the regressions, including firm size, capital intensity, operating cycle, cash flow variability, sales variability and the incidence of losses. The coefficients on accrual quality decrease dras-

Table 8
Estimation of the market pricing of positive and negative normal accruals with respect to their implications for one-year-ahead earnings.

	Forecast equation		Return equation		Market efficiency test		
	Coef.	Z-stat	Coef.	Z-stat	Chi2	P > Chi2	
β			1.2476 ^{***}	11.30			
β_0	0.0105 ^{***}	6.91	β_0^*	-0.1258 ^{***}	-7.75		
β_1	0.6210 ^{***}	51.65	β_1^*	1.1647 ^{***}	11.85	$\beta_1 = \beta_1^*$	30.17 ^{***}
β_2	0.4838 ^{***}	43.43	β_2^*	1.0994 ^{***}	11.42	$\beta_2 = \beta_2^*$	40.33 ^{***}
β_3	0.5295^{***}	26.83	β_3^*	1.2385^{***}	8.04	$\beta_3 = \beta_3^*$	20.84^{***}
β_4	0.4876^{***}	15.98	β_4^*	0.9346^{***}	4.23	$\beta_4 = \beta_4^*$	4.01^{**}

*** Denote statistical significance at the 1% level.
 ** Denote statistical significance at the 5% level.
 * Denote statistical significance at the 10% level.

tically, but remain significant, suggesting that poor accrual quality, whether due to the fundamental earnings process or the accounting system used to measure that process, can lead to higher trading costs.

7. Conclusion

Accruals provide investors with useful information about firm value. In China, however, not all investors can understand accrual information because of the country's low degree of market efficiency. In this paper, I find that investors in China misunderstand both abnormal and normal accruals. A higher absolute value of abnormal (normal) accruals is associated with higher stock trading costs. Moreover, under the short-selling constraints that prevail in the Chinese stock market, negative abnormal (normal) accruals have a greater effect on stock trading costs than positive abnormal (normal) accruals.

This paper has implications for accounting theory, securities regulation, and investment. First, the empirical evidence presented herein shows that the basic function of accounting is not only to provide a reliable record (of abnormal accruals, for example), but also to reflect economic reality. Trading costs will increase in the securities market if investors cannot understand a firm's economic reality (such as normal accruals). Second, this paper also shows that full disclosure, as suggested by the information perspective, is limited regardless of the disclosure form. Both the information and measurement perspectives should be considered when providing accounting information in a weak efficiency market. Third, I find market efficiency is weak in China and investors are naïve and fixated on earnings. Thus, to help Chinese investors to correctly price earnings, the government should increase the number of security analysts and the ownership level of institutional investors. Finally, the results presented in this paper imply that investors should pay close attention to both abnormal and normal accruals to avoid investment losses. Future research should consider the effects of short-selling constraints on the other economic consequences of earnings quality in China.

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