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Corporate Transparency and the Impact of Investor Sentiment on Stock Prices

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Using China's stock market as the testing venue, this study examines how corporate transparency helps explain the sensitivity of stock prices to general investor sentiment. We find that firms with low corporate transparency, measured by a battery of proxies including state ownership, the prevalence of related party transactions, accrual-based earnings management, audit opinions, and the quality of audit firms, are more affected by investor sentiment than are firms with high corporate transparency. Overall, our findings highlight the importance of corporate transparency in mitigating the effects of investor sentiment on stock prices.

Data, as supplemental material, are available at http://dx.doi.org/10.1287/mnsc.2014.1911.

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1. Introduction

Recent research has documented that investor sentiment plays an important role in explaining asset prices (e.g., Lemmon and Portniaguina 2006, Das and Chen 2007, Seybert and Yang 2012, Stambaugh et al. 2012, Cen et al. 2013). The sentiment effect varies across firms and may depend on "noise trader risk" (Lee et al. 1991, Kumar and Lee 2006) and on the operating and financial characteristics of the firms. Baker and Wurgler (2006, 2007) argue that some firms are more difficult to value using fundamental factors and are therefore more sensitive to sentiment effects. At the empirical level, they show that firms whose valuations are highly subjective, for example, those that are small, young, unprofitable, risky, high growth, and distressed, are more susceptible to sentiment effects. We note here, however, that Baker and Wurgler's (2006) study was based on U.S. firms, which have relatively uniform and high-quality reporting and disclosure standards when compared to firms in emerging markets.

In this study, we extend the literature by investigating how corporate transparency, broadly defined as the extent to which firm-specific information is credibly disclosed to market participants (Bushman et al. 2004), is related to investor sentiment effects in financial markets. Low corporate transparency reduces the supply of accurate firm-specific information and heightens information asymmetry between firms and external investors. Such an information environment restricts the ability of outside investors to make accurate assessments of the valuation parameters that underlie stock price formation. Having less reliable information to count on in their decision making makes investors and other market participants rely more on subjective judgments and results in a greater reliance on general investment sentiment. To date, however, the impact of corporate transparency on investor sentiment has not been examined empirically.

Another way in which we extend the prior literature is that we use data from the world's largest emerging and transitional economy, namely, China. Research on investor sentiment has hitherto focused on developed and highly regulated markets such as the United States and the United Kingdom (e.g., Baker and Wurgler 2006, Seybert and Yang 2012, Gemmill and Thomas 2002). In contrast, there is little evidence available for emerging markets, which are vastly different from developed markets in terms of return volatility, ownership structure, investor protection, and corporate governance (Bekaert and Harvey 1997, Lemmon and Lins 2003, Leuz et al. 2003). These differences will affect firm equity valuation and are very likely to result in different sources and different patterns of sentiment-driven price movements from those documented in developed markets. For example, with

respect to market participants, the Chinese stock market is dominated by individual investors (Ng and Wu 2006), and short selling and margin trading are prohibited, which restricts the abilities of arbitrageurs to take advantage of mispricing[1] (Sharif et al. 2014). All of these characteristics contrast sharply with developed markets where large and active institutional investors dominate stock trading and where short sales and margin trading enable quicker price discovery (Pekarek and Meseha 2011). Furthermore, having a limited stock market history and having few or no experiences of market downturns may make investors more prone to optimism, which in turn fuels valuation bubbles (e.g., Barber and Odean 2008, Barber et al. 2009; Greenwood and Nagel 2009). Thus, investigating investor sentiment effects in the context of emerging markets provides an important addition to the literature.

China's stock market offers a particularly useful testing ground for the investigation of the influences of corporate transparency on investor sentiment effects. Since its inception in 1991, the Chinese stock market has grown exponentially to become the second largest in the world (after the United States).[2] Although China has enacted property rights laws and introduced accounting, disclosure, and governance regulations that mirror those in the United States and other well-established markets, the enforcement of these laws, rules, and regulations is often very lax and capricious. As a consequence of this, there are substantial variations across firms in terms of transparency (Piotroski and Wong 2011). This variation in disclosure quality across firms allows us to test our arguments.

The combinations of highly variable corporate transparency with limited arbitrage opportunities (no short selling and no margin trading) and the dominance of individual investors are likely to greatly amplify sentiment influences in China's capital markets. Importantly for our research, China's stock market operates under capital controls where domestic (foreign) investors are allowed to invest in overseas (domestic) markets only after obtaining a quota from the State Administration of Foreign Exchanges through the highly restrictive channels of the Qualified Foreign Institutional Investors Scheme (Qualified Domestic Institutional Investors Scheme). As at the end of 2010, the total approved amount of quotas for foreign (domestic investors) was U.S. $19.72 billion (U.S. $68.36 billion), which accounted for only 0.4% (1.44%) of the total market capitalization of all stocks (*Reuters News* 2011). As a result of these restrictions, China's financial market is characterized by a low degree of openness, and the stock market is to a very large extent isolated from other stock markets. According to Chinn and Ito (2008), China is ranked 165 out of 181 countries in the financial openness index, where rank 1 is the most open. The closed nature of China's stock market offers a relatively clean setting to study the shifts in domestic market sentiments without yielding to concerns about sentiment contagion from other markets (Baker et al. 2012).

We measure corporate transparency in five different ways. We use three variables that have been used extensively in previous research to capture the quality of firm-specific financial information, namely, earnings management, auditor quality, and audit opinions (Hutton et al. 2009, Fan and Wong 2005, Choi and Jeter 1992). We also include two variables that are particularly germane to Chinese firms (and to firms in other transitional economies): related-party transactions (RPTs) and state ownership of firms. Importantly for our study, both of these factors have been shown to be associated with the degree of firm-level information opacity in previous studies (e.g., Jian and Wong 2010, Jiang et al. 2010).

To measure investor sentiment, we follow the general approach of Baker and Wurgler (2006) and construct an aggregate measure of investor sentiment from seven variables, namely, closed-end fund discounts, market turnover, the number of initial public offerings (IPOs), IPO first-day returns, the share of equity issues in new financing, the growth of investment accounts, and the growth of savings deposits. We show that our sentiment index is negatively related to subsequent market returns starting from five months after, and the relation becomes significant at 12 months onward and thus is consistent with the existence of sentiment effects in the market.

The cross-sectional contemporaneous patterns of sentiment-driven mispricing are difficult to identify directly, so our empirical tests concentrate on the long-run effects of sentiment on stock returns. Specifically, we focus on the time horizons of 9 months, 12 months, and 15 months. We find that sentiment effects are significantly greater for firms with more earnings management or that receive nonclean audit opinions (i.e., qualified, negative, or disclaimer opinions) and are less significant for firms that are audited by Big 4 certified public accounting (CPA) firms. Firms that have more complex RPT activity are more affected by shifts in sentiment than are firms with less complex

[1] China announced in January 2010 that a pilot scheme would be launched in March to lift the bans on short selling and margin trading for a designated list of stocks listed on China's two stock exchanges. Specifically, 90 constituent stocks on a designated list were eligible for margin trading and short selling. This list was revised twice in July 2010, with six stocks being deleted and six new stocks being added. In December 2011, the exchanges expanded the list to include 278 qualified constituent stocks as well as 7 exchange-traded funds. We end our sample period before this reform to mitigate the influences associated with changing constraints on short selling in the stock market.

[2] As of the end of 2010, the number of Shanghai and Shenzhen listed companies was 2,063, with a total market value of U.S. $4.76 trillion (Shenzhen Stock Exchange 2010, Shanghai Stock Exchange 2011).

RPTs. Furthermore, state-controlled listed firms are more affected by sentiment than are privately controlled firms. Our results consistently suggest that greater firm-level transparency is significantly associated with lower sentiment impacts on stock prices. To the extent that China is similar to other emerging and transitional economies, we believe our finding that low-transparency firms are more susceptible to investor sentiment will have resonance in these other countries.

Our overall findings that lower corporate transparency is associated with greater levels of sentiment effects on stock prices complement the findings in the extant sentiment literature. Whereas prior studies generally focus on the noise trader behavior or valuation subjectivity as reflected in a firm's fundamentals, we provide evidence that suggests that firm-specific transparency can also help explain the extent of a firm's exposure to the sentiment factor. A direct implication of our study is that corporate governance reforms that enhance firm-level transparency can contribute to stock market efficiency through mitigating the influence of subjective forces on the pricing of a firm's shares. Noise in stock prices engendered by sentiment can hinder the ability of corporations to use stock-based compensation schemes as a motivational and incentive-alignment tool. Sentiment can also adversely affect a corporation's ability to obtain financial resources from capital markets because stock price noise can render the estimation of costs of capital difficult. This can lead to distortions and inefficiencies in capital investments. Our findings on the relations between corporate transparency and investor sentiment effects suggest that corporate management can mitigate the fluctuations in their firms' stock prices by improving disclosure policies and corporate communications with investors.

2. Hypotheses Development

2.1. Sentiment Effects: Business Uncertainties or Corporate Transparency?

Baker and Wurgler (2006) argue that firms that are difficult to value are more susceptible to investor sentiment. There are two main reasons why a firm may be difficult to value. One reason relates to fundamental factors that encompass the uncertainties surrounding a firm's business activities and its operating environment. Fundamental factors are explored by Baker and Wurgler (2006) using data from U.S. firms. They find that small, young, risky, loss, high-growth, and distressed firms are more difficult to value. Consistent with the arguments about difficult-to-value firms, Hribar and McInnis (2012) show that analysts' forecasts of earnings are less accurate for these types of firms.

Another major reason why firms are difficult to value is because of a lack of corporate transparency. Bushman et al. (2004) argue that corporate transparency is an outcome of a multifactor system that includes the quality of reporting standards and the intensity of private information acquisition and dissemination. A large body of research has shown that corporate transparency in emerging markets such as China tend to be low due to the countries' weak legal framework, unsophisticated financial intermediary sector, and restricted public and media press freedom (Piotroski and Wong 2011, Bushman et al. 2004, Ball et al. 2000). Furthermore, Durnev and Kim (2005) show that the variations in corporate disclosure is greater in financial markets with lower investor protection, because some firms may deliberately obscure their disclosures for nefarious reasons such as hiding losses or expropriation activities (Firth et al. 2011), whereas other firms may voluntarily disclose more information to signal their good quality and to correct mispricing. We argue that the lack of corporate transparency presents a source of valuation difficulties for outside investors in emerging markets because they do not have sufficient and reliable information to evaluate the business fundamentals of publicly listed firms. We further argue that such valuation difficulties will amplify the investor sentiment effects in emerging financial markets.

Theoretically, the difficulties involved in valuing the assets of a company are a function of its business uncertainties as well as its corporate transparency. In developed financial markets such as the United States, where corporate transparency tends to be high and relatively uniform across firms, the valuation difficulties stem mainly from business uncertainties. However, corporate transparency may become the most significant source of valuation difficulties in emerging markets where investors do not have enough reliable firm-specific information. Under this situation, the firm characteristics studied by Baker and Wurgler (2006) may be subdued and may not have the same implications for sentiment effects as they do in mature markets. For example, when investors are not equipped with sufficient firm-specific information, valuing large firms should be more difficult than valuing small firms because large firms inherently engage in more intrafirm transactions, operate in a larger number of business and market segments, and have more organizational complexity (Williamson 1967, Ranger-Moore 1997, Dewenter et al. 2001). As a result, large firms rather than small firms may be associated with stronger sentiment effects. Similarly, profitable firms may be more difficult to value than loss-making firms in the emerging markets because profitable firms in these markets tend to face higher governmental expropriation risks (Watts and Zimmerman 1986) and consequently have a greater incentive to reduce their level of corporate transparency to "mitigate the risk of governmental expropriation" (Durnev et al. 2009, p. 1534).

To gain some insight into which reason for sentiment effects is the most important in China, we first replicate the work of Baker and Wurgler (2006) using data from Chinese listed firms. Our results are not significant or have signs that are opposite to those in Baker and Wurgler (2006), except for return volatility.[3] For example, we find that the stock returns of large firms are more affected by sentiment. This is opposite to the findings for U.S. firms, but is consistent with our corporate transparency perspective. Prior literature suggests that return volatility is associated with firm fundamental risk such as earnings growth (Xu and Malkiel 2003, Wei and Zhang 2006) as well as corporate transparency measures such as financial reporting quality (Rajgopal and Venkatachalam 2011). Valuation difficulties, regardless of source, will result in greater return volatility. Therefore, the results on return volatility are consistent with both the business uncertainty and transparency perspectives. Overall, business uncertainties as suggested by Baker and Wurgler (2006) do not explain the empirical results of sentiment effects in China. Therefore, we turn our attention to corporate transparency to explain cross-section sentiment effects.

2.2. Corporate Transparency and Investors' Reliance on Sentiment

2.2.1. Quality of Financial Information. Many listed Chinese firms provide only the minimum level of disclosures mandated by the regulator, the Chinese Securities Regulatory Commission (CSRC), and they seldom release voluntary, firm-specific information prior to the release of the annual report (Haw et al. 2005). Even though the quantity of financial information disclosures has improved following the recent adoptions of international accounting standards and disclosure rules, investors still have reservations about the quality of the reported numbers because earnings management practices are prevalent among Chinese listed firms (Aharony et al. 2000, Chen and Yuan 2004, Firth et al. 2011). Hutton et al. (2009) argue that aggressive earnings management can measure management's general proclivity to hide information from the capital market. Following these studies, we use accruals management as a measure of financial information quality (opacity). We expect that firms with more extensive accruals management are associated with a lower level of corporate transparency, which in turn makes the stocks more sensitive to shifts in investor sentiment. This leads to our first hypothesis.

Hypothesis 1. *Firms with greater accruals management* (*i.e.*, *are more opaque*) *are more affected by investor sentiment than are firms with lesser accruals management*.

The quality and reliability of accounting information can be improved if there is an independent and reliable auditor (Fan and Wong 2005). Since DeFond et al. (1999) suggest that Big 5 (now Big 4) auditors have a market advantage over local Chinese auditors among the clientele that demand high-quality audits, we therefore use the international Big 4 audit firms as another proxy for firms with high-quality accounting information and argue that employing Big 4 auditors can mitigate a firm's sensitivity to sentiment. Our second hypothesis follows.

Hypothesis 2. *Firms audited by an international Big* 4 *CPA firm are less affected by investor sentiment than are firms audited by local CPA firms*.

If auditors serve as external and independent monitors and take into account the audit risks associated with fraud, managerial entrenchment, political interference, and potential earnings manipulation, they will be more likely to give modified opinions to firms with problematic financial statements. Choi and Jeter (1992) find that a qualified audit opinion reduces the stock market's responsiveness to the subsequent earnings announcements of the firm. Their findings suggest that a qualified audit opinion signifies to the market that there is an increase in the level of uncertainty, or noise, in the firm's present and future earnings numbers, and this constrains the market's ability to make inferences about the firm's future cash flows from accounting information. We therefore use a nonclean audit opinion as a third proxy of financial information opacity. Our hypothesis is as follows.

Hypothesis 3. *Firms with nonclean audit opinions* (*i.e.*, *qualified*, *negative*, *or disclaimer*) *are more affected by investor sentiment than are a control group with unqualified audit opinions*.

2.2.2. Complexity of Related-Party Transactions (CRPT). RPTs, defined as any transaction between a company or any of its subsidiaries and a connected party, are widespread among listed firms in China. Peng et al. (2011) show that out of 719 listed firms in 1997, 609 firms (84.6%) were involved to different degrees in related-party transactions. In 2000, the percentage of firms with RPTs reached 93.2%. Initially, the primary reason for the prevalence of RPTs is that many listed firms in China are spin-offs or carve-outs from much larger state-owned enterprises (SOEs). After the IPO, most of the listed firms serve as the nexus of a large business group structured with multiple layers and with many firms in each layer, and they frequently engage in RPTs with other group members (Deng et al. 2012). However, in later years, many privately owned firms have listed on China's stock exchanges. These privately owned listed firms are often part of a wide web of firms controlled by the dominant private shareholders, and they engage in extensive RPT activities.

There are two main reasons why firms that engage in more complex RPT activity tend to be less transparent

[3] Detailed results are available from the authors upon request.

than those with less complex RPT activity. First, prices used in RPTs are not necessarily based on the fair value principle (Lo et al. 2010) and rely less on accounting-based contracts for enforcement purposes. Second, RPTs in China and other financial markets have been used as a vehicle to expropriate minority shareholders as well as a vehicle for transferring valuable resources into the publicly listed firms (Cheung et al. 2006, Deng et al. 2012, Jian and Wong 2010). Without sufficient disclosure, it is difficult and costly for outside investors to understand the impact of RPTs on firm value. Furthermore, investors with limited cognitive ability may rely more on heuristics to evaluate firms with highly complex RPTs, which leads to stock prices being more sensitive to investor sentiment. As a result of this, we expect that firms with more complex related-party transactions will be more affected by investor sentiment.[4] This leads to our fourth hypothesis.

Hypothesis 4. *Firms with more complex related-party transactions are more affected by investor sentiment than are those with less complex related-party transactions.*

2.2.3. State Ownership. There are two reasons why SOEs tend to have a less transparent information environment than those of private firms. First, SOEs tend to have lower managerial-based and market-based incentives to provide credible accounting information to the markets than do private firms (Ball et al. 2000, Bushman et al. 2004). Shleifer and Vishny (1994) argue that state owners rely on private information channels and their political networks, instead of accounting and stock price information, to measure and evaluate firm and manager performance. Furthermore, SOEs are usually favored by government when it comes to gaining access to finance and business opportunities, which further reduces the need for SOEs to provide credible financial reports (Firth et al. 2009).

Second, the operations of SOEs are influenced not only by a grabbing hand where governments tend to use corporate resources to serve political and social objectives, but also a helping hand where governments tend to grant favorable access to finance and preferential business opportunities to their favored SOEs (Shleifer and Vishny 1994). The argument here is similar to that for RPTs; the major owner has a bidirectional influence on corporate value, and this creates uncertainties for outsider investors.

The proposition that state-controlled listed firms are less transparent is backed by recent empirical evidence. In a cross-country study, Bushman et al. (2004) find that corporate transparency is lower in countries where state ownership of enterprises and banks is higher. Leuz and Oberholzer-Gee (2006) find that firms with strong political connections have lower corporate transparency. Piotroski et al. (2014) document that SOEs in China have a higher incentive to suppress negative financial information than do privately controlled firms. Based on the aforementioned arguments and studies, we hypothesize that state-controlled listed firms are more affected by investor sentiment because of their low corporate transparency. This leads to our fifth hypothesis.

Hypothesis 5. *SOEs are more affected by investor sentiment than are privately controlled firms.*

3. Constructing the Sentiment Index

Unlike financial market activities and corporate events, investor sentiment is a perception-based construct that is inherently difficult to measure. Baker and Wurgler (2006) designed a sentiment measure using principal component analysis based on six financial variables, namely, closed-end fund discounts, market turnover, the number of IPOs, IPO first-day return, the share of equity issues in total equity and debt issues, and dividend premium. In this paper, we follow the Baker and Wurgler (2006) approach and construct a monthly investor sentiment index in China during the period from January 1999 to December 2009.

3.1. Developing a Sentiment Index for the Chinese Stock Market

We develop a composite sentiment index based on the common variation in seven underlying proxies for sentiment: the closed-end fund discount (*CEFD*), market turnover (*TURN*), the number of IPOs and their average first-day stock returns (*NIPO* and *RIPO*), the proportion of equity issues in the total issue of equity and long-term debt (*Eshare*), the deposit savings growth rate (*DSG*), and the number of new investment accounts (*NACT*). The first five variables are constructed in the same way as reported in Baker and Wurgler (2006). *CEFD* is constructed as the value-weighted average of the difference between the market prices of closed-end fund shares and their net asset value per share, divided by the net asset value per share. *TURN* is defined as the natural log of the ratio of monthly market trading volume to the aggregate market value, detrended by the five-month moving average. *NIPO* and *RIPO* refer to the number of IPOs and the average market-adjusted first-day returns, respectively. We use

[4] We argue that RPTs increase corporate opacity because they have a bidirectional impact on firm value (tunneling or propping), as opposed to only serving as a device for tunneling (agency costs). Theoretically, well-defined agency costs tend to reduce firm value (Fama and Jensen 1983), rather than directly increase firm valuation difficulties. To verify whether it is agency costs that drive our results, we run the same tests with three commonly used measures of agency costs, namely, the share ownership of management, the share ownership of the controlling shareholder, and leverage. However, our results show no evidence that agency costs are significantly associated with sentiment effects.

the proportion of new equity issuance to total capital raised in a year (*Eshare*). Specifically, *Eshare* is defined as the ratio of equity issues to total equity issues and bank borrowing.[5]

In addition to the above factors that were identified and used in Baker and Wurgler (2006), we also use the growth of deposit savings and the number of new investment accounts to capture investor sentiment in China's stock market. Frazzini and Lamont (2008) and Ben-Rephael et al. (2012) measure sentiment using mutual fund flows, which reflect individual retail investors' reallocation of their money across different investment alternatives. Analogous to their studies, we use the rate of deposit savings growth to gauge investor sentiment in China. Because of the underdeveloped nature of financial markets and capital controls in China, local investors shift their money mostly between banks and equity markets. When they become more enamored with the stock market, they aggressively substitute away from their traditional concentration in savings accounts. Burdekin and Redfern (2009) find that rising stock market sentiment exerted a statistically significant negative effect on China's time deposit growth during 2003–2007, which corroborates our argument. The same authors show that the growth of money supply (*M*0) is also significantly associated with the growth of deposit savings, so we account for this factor in our calculations. In particular, we define the *DSG* as the residual from a regression of the growth of seasonally adjusted deposit savings on the growth rate of *M*0.

We also use the number of new investors who open trading accounts for the first time as an additional component of sentiment. Compared with developed markets, China has a young market with net new investors entering the stock market during the past decade. Since new investors have few or no prior investment experiences, their participation and investment choice decisions may heavily rely on market sentiment conditions rather than rational deliberations of fundamentals. Furthermore, these inexperienced investors, who have not yet directly experienced the consequences of a major stock market downturn, are more prone to the optimism that fuels stock market bubbles (Greenwood and Nagel 2009). We therefore argue that the speed of novice entry rate into the stock market (*NACT*) is also a potential proxy for investor sentiment. *NACT* is defined as the natural log of the number of new investment accounts.

[5] We use firms' total long-term debt instead of corporate bonds as used in Baker and Wurgler (2006) because corporate bond issuance by public firms is rare in China. Most corporate bond issuers are nonlisted SOEs (Haw et al. 2005). The most prevalent financing channels for listed firms are direct borrowing from banks and equity issuance.

Following the approach of Baker and Wurgler (2006), we use principal components analysis to isolate the common component of the factors. Since the various components of sentiment may reflect the same sentiment but in different time frames, we perform factor analysis with all proxies and their lags to determine the best lag structure of each measure. The sentiment index is constructed as the first principal component based on the correlation matrix of sentiment proxies with each measure's current or lagged value, whichever has a higher loading on the main factor, identified in the factor analysis. The first principal component explains 38.12% of the sample variance, which is comparable to the explanatory powers of sentiment indexes reported in major developed countries (Baker et al. 2012). The sentiment index is constructed as follows:

$$\begin{aligned}\text{sentiment}_t = {} & -0.0863CEFD_{t-1} + 0.4960TURN_{t-1} \\ & + 0.3592NIPO_t + 0.3286RIPO_t \\ & + 0.3699Eshare_t - 0.3326DSG_{t-1} \\ & + 0.5120NACT_{t-1}. \end{aligned} \quad (1)$$

Because some of the sentiment proxies may reflect economic fundamentals over the business cycle, we then construct a second index that explicitly removes business cycle variation from each of the proxies prior to the principal component analysis. To accomplish this, we regress each of the seven raw proxies on the industrial production growth rate and the consumption growth rate. The corresponding first principal component explains 40.02% of the sample variance. The final sentiment index is constructed as follows:

$$\begin{aligned}\text{sentiment } \perp_t = {} & -0.0361CEFD_{t-1} + 0.4761TURN_{t-1} \\ & + 0.3418NIPO_t + 0.3381RIPO_t \\ & + 0.4089Eshare_t - 0.3466DSG_{t-1} \\ & + 0.5036NACT_{t-1}. \end{aligned} \quad (2)$$

NACT has the highest loadings in the sentiment index, and the factor loading on *DSG* is higher than those on *CEFD*, *NIPO*, and *RIPO*, which implies both proxies are of great importance in constructing a sentiment index in China. We verify the importance of *DSG* and *NACT* by examining their correlations with the quarterly sentiment survey produced by the People's Bank of China (PBOC). We use the changes in both of the sentiment indices and the change in the sentiment index from the PBOC survey to avoid autocorrelation bias (both sentiment indices and the survey are highly autocorrelated). The results in panel A of Table 1 show that the sentiment index including *NACT* and *DSG* has a higher correlation (0.29) with the PBOC survey, with significance at the 5% level, whereas the correlation between the sentiment index excluding *NACT* and *DSG* and the PBOC survey is lower (0.17) and statistically

Table 1 Validation of the Sentiment Index and Its Association with Future Stock Returns

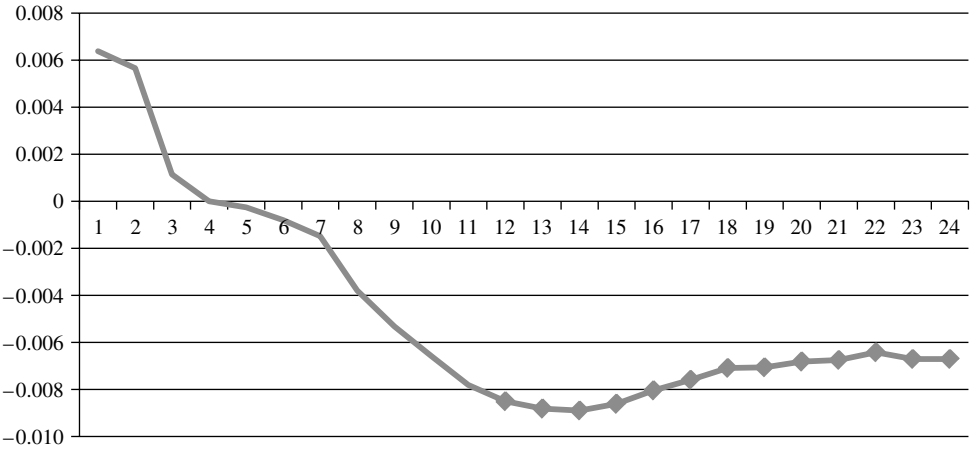
Panel A: Correlations among the changes in three different sentiment measures

	PBOC	*SENT*5	*SENT*7
PBOC	1.00		
*SENT*5	0.17 (0.23)	1.00	
*SENT*7	0.29 (0.03)	0.78 (0.00)	1.00

Panel B: Time-series regressions of overall excess market returns on investor sentiment (*SENT*)

K	1	2	3	4	5	6	7	8
β ($*100$)	0.64	0.57	0.11	0.00	−0.03	−0.08	−0.15	−0.38
p-value	(0.73)	(0.64)	(0.64)	(0.80)	(0.68)	(0.67)	(0.62)	(0.55)
K	9	10	11	12	13	14	15	16
β ($*100$)	−0.53	−0.66	−0.78	−0.85	−0.88	−0.89	−0.86	−0.81
p-value	(0.32)	(0.17)	(0.11)	(0.04)	(0.02)	(0.01)	(0.00)	(0.00)
K	17	18	19	20	21	22	23	24
β ($*100$)	−0.76	−0.71	−0.71	−0.68	−0.68	−0.64	−0.67	−0.67
p-value	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)

Panel C: Graph of the *SENT* coefficient (β) over time



Notes. Panel A shows the Pearson correlations among the changes in three different sentiment measures, from September 2003 to December 2009. *PBOC* is a direct survey of data of investor sentiment conducted by the People's Bank of China on a quarterly basis since 2003. *SENT*5 and *SENT*7 refer to the sentiment indices constructed without and with *DSG* (growth in savings deposits) and *NACT* (number of new investment accounts), respectively. The *p*-values are reported in parentheses. In panel B, $\sum_{k=1}^{K}[(ExRET_{t+k})/K] = \alpha + \beta SENT_t + \gamma_1 ExRET_t + \gamma_2 EP_t + \gamma_3 RF_t + \gamma_4 INFL_t + \varepsilon_{t+k}$, where *SENT* refers to the investor sentiment index, *ExRET* refers to the *equal-weighted* market return over the risk-free rate, *EP* refers to the market-level earnings-to-price ratio, *RF* refers to the risk-free rate, measured by the monthly interest rate on one-year fixed deposits, and *INFL* refers to the monthly rate of inflation. Simulated *p*-values are reported in parentheses and are for two-sided tests for the hypothesis that the slope coefficient β does not equal 0.

insignificant. Because the PBOC quarterly sentiment index is available only since 2003, we do not use it as a measure of market sentiment in our subsequent tests.

3.2. Validating the Sentiment Index

If excessive investor optimism leads to periods of market overvaluation, periods of high sentiment should be followed by low long-run returns as the market price reverts to its intrinsic value. To investigate this issue, we run regressions of future excess market return ($ExRET_{t+k}$) on the sentiment index (*SENT*) and hypothesize that the sentiment coefficients should be negative. We calculate $ExRET_{t+k}$ as the value-weighted market returns minus the risk-free rate measured by the monthly interest rate on one-year fixed deposits (Wang and Di Iorio 2007) and cumulate it over various horizons from 1 to 24 months. Following Brown and Cliff (2005) and Lemmon and Portniaguina (2006), we use macroeconomic variables drawn from the conditional asset pricing literature as controls, namely,

Table 2 Investor Sentiment Data

	Mean	SD	P25	Median	P75	Correlations with sentiment		Correlations with sentiment components					
						SENT	$SENT^{\perp}$	*CEFD*	*TURN*	*NIPO*	*RIPO*	*Eshare*	*DSG*
Panel A: Raw data													
$CEFD_{t-1}$ (%)	−18.31	13.72	−28.03	−19.07	−9.92	−0.14	0.02	1					
$TURN_{t-1}$	5.73	0.47	5.37	5.72	6.13	0.81*	0.71*	−0.28*	1				
$NIPO_t$	6.81	5.82	3	6	10	0.59*	0.57*	0.13	0.31*	1			
$RIPO_t$ (%)	1.16	0.60	0.71	1.02	1.50	0.54*	0.57*	0.18***	0.23**	0.11	1		
$Eshare_t$ (%)	1.18	1.44	0.20	0.60	1.65	0.60*	0.66*	0.22*	0.25*	0.49*	0.23**	1	
DSG_{t-1} (%)	−0.04	0.91	−0.60	−0.03	0.44	−0.54*	−0.57*	0.01	−0.28*	−0.29*	−0.22**	−0.28*	1
$NACT_{t-1}$	5.93	1.25	4.77	5.79	6.94	0.84*	0.77*	0.18**	0.70*	0.34*	0.50*	0.35*	−0.23*
Panel B: Controlling for macroeconomic conditions													
$CEFD^{\perp}_{t-1}$ (%)	0.00	10.56	−8.87	0.10	7.16	0.01	0.06	1					
$TURN^{\perp}_{t-1}$	0.00	0.41	−0.31	−0.07	0.31	0.77*	0.80*	−0.07	1				
$NIPO^{\perp}_t$	0.00	5.31	−3.97	−1.21	2.71	0.56*	0.57*	−0.03	0.37*	1			
$RIPO^{\perp}_t$ (%)	0.00	0.60	−0.45	−0.15	0.34	0.53*	0.57*	0.25*	0.25**	0.10	1		
$Eshare^{\perp}_t$ (%)	0.00	1.42	−0.92	−0.57	0.50	0.67*	0.68*	0.02	0.38*	0.46*	0.23**	1	
$DSG^{\perp}_{t-1}$ (%)	0.00	0.90	−0.60	0.05	0.49	−0.58*	−0.58*	0.08	−0.38*	−0.24**	−0.22**	−0.27*	1
$NACT^{\perp}_{t-1}$	0.00	1.11	−0.90	−0.03	0.75	0.79*	0.84*	0.38*	0.66*	0.27*	0.55*	0.46*	−0.32*

Notes. In panel A, we show summary statistics for the raw sentiment proxies. *CEFD* is the value-weighted average discount rate of closed-end mutual funds. *TURN* is natural log of monthly market trading volume divided by average market value, detrended by the five-month moving average. *NIPO* is the monthly number of initial public offerings. *RIPO* is the average market-adjusted first-day returns of initial public offerings. *Eshare* is the ratio of equity issues to total equity issues and bank borrowing. *DSG* is the growth rate of savings deposits controlling for the growth of money supply (*M*0). *NACT* is the natural log number of new investment accounts (in thousands). *SENT* is the first principal component of the seven sentiment proxies. In panel B, we regress each of the seven proxies on the growth in industrial production and consumption growth rate. The orthogonalized proxies, labeled with a "⊥," are the residuals from these regressions. $SENT^{\perp}$ is the first principal component of the seven orthogonalized proxies.

*Statistically significant at the 1% level; **statistically significant at the 5% level; ***statistically significant at the 10% level.

the contemporaneous market return ($ExRET_t$), the aggregate earnings-to-price ratio (EP_t),[6] the monthly interest rate (RF_t), and the inflation rate ($INFL_t$).

However, the sentiment index we construct is predetermined and not strictly exogenous, and therefore the ordinary least squares (OLS) estimators from regressions on lagged endogenous variables are biased in finite samples (Stambaugh 1999). Moreover, the residuals from regressions with overlapping observations are serially correlated up to lag $K-1$ under both the null hypothesis and alternate hypotheses that fully account for time-varying expected returns (Swaminathan 1996). To circumvent these problems, we use the same approach as Nelson and Kim (1993) and Neal and Wheatley (1998) to assess significance by comparing test statistics to their empirical distributions computed from randomization simulations.

Panel B of Table 1 presents the coefficients and simulation *p*-values from the time-series regressions, with *ExRET* as a dependent variable on lagged *SENT* and other control variables. The coefficients on *SENT* decline monotonically through to the 14th month (after which they increase slowly) and become significantly negative at a *p*-value of 0.05 or lower as the forecasting horizon extends to 12 months and beyond. Panel C of Table 1 graphs the decline in the *SENT* coefficients over time. These results validate the sentiment index as a determinant of stock market pricing. Previous studies that investigate sentiment effects in the U.S. market document price reversals induced by sentiment over a relatively longer time horizon and in only certain segments of stocks. For example, in Brown and Cliff (2005), the significance occurs over the 12-month horizon or longer and only in the firm groups with big size and/or low book-to-market ratios. Although differences in the way sentiment is measured may limit cross-study comparisons, no prior study documents such a significant and negative relation between sentiment and subsequent market returns as we do. The regression results in later tables show that the *SENT* coefficients in portfolios over 12-month and 15-month horizons are universally significantly negative no matter what factors are used to construct portfolios, indicating that sentiment affects most stocks in the market rather than only a portion of them. This widespread sentiment effect is consistent with the dominance of individual investors and short-sale prohibitions in China, which reduces the ability of investors to engage in arbitrage.

The summary statistics and correlations of the components of the sentiment index are shown in Table 2. We find that most of the components are significantly correlated with each other with the expected signs.

[6] We use the aggregate earnings-to-price ratio as an alternative measure to the dividend yield because, on average, less than half of Chinese firms (46%) paid dividends during our sample period.

In particular, *NACT*, the number of new investment accounts, is significantly correlated with every other component, consistent with *NACT* contributing most to the sentiment index. Orthogonalizing to macro variables only slightly changes the correlations among the sentiment components.

4. Empirical Analysis

4.1. Sample Description and Data Sources

Our investigation period ranges from January 1999 to December 2009. The primary reason for starting our analysis from the beginning of 1999 is that the first closed-end fund in China opened in April 1998, and CEFDs have been shown to be an important sentiment measure in many prior studies (e.g., Lee et al. 1991, Neal and Wheatley 1998). Our investor sentiment composite index consists of 132 monthly observations, and the initial sample contains all nonfinancial firms listed on either of the Shanghai or Shenzhen *A*-share stock exchanges.[7] Financial firms are excluded because information for these firms does not have the same meaning as for nonfinancial firms. We also exclude firms with negative equity book value. To be included in our sample, a company must have been listed for at least three years and have filed the complete financial information required for our analysis. Our final sample comprises 160,794 firm-month observations, after deleting the first year observations in the post-IPO period. All the continuous variables are winsorized at 1% and 99% to reduce the effect of outliers on the analysis. We obtain financial and stock price data from the China Stock Market and Accounting Research databases.

4.2. Construction of Key Measures of Corporate Transparency

4.2.1. Earnings Management. We first calculate annual discretionary accruals as the residual from the modified Jones model (Dechow et al. 1995). We add return on assets (ROA) as an additional control variable because previous research finds that the Jones model is misspecified for well-performing or poorly performing firms (Kothari et al. 2005). We estimate the following cross-sectional regression equation using firms in each industry for each fiscal year between 1996 and 2008:[8]

$$\frac{TACC_{jt}}{TA_{jt-1}} = a\frac{1}{TA_{jt-1}} + b\frac{\Delta Sales_{jt}}{TA_{jt-1}} + c\frac{PPE_{jt}}{TA_{jt-1}} + dROA_{jt} + \varepsilon_{jt}, \quad (3)$$

where $TACC_{jt}$ denotes total accruals for firm j during year t; TA_{jt-1} denotes total assets for firm j at the end of year $t-1$; $\Delta Sales_{jt}$ denotes change in sales for firm j in year t; PPE_{jt} denotes property, plant, and equipment for firm j at the end of year t; and ROA_{jt} represents return on assets.

Discretionary annual accruals ($DACC_{jt}$) are calculated using the parameter estimates from Equation (3):

$$DACC_{jt} = \frac{TACC_{jt}}{TA_{jt-1}} - \left(\hat{a}\frac{1}{TA_{jt-1}} + \hat{b}\frac{\Delta Sales_{jt} - \Delta Rec_{jt}}{TA_{jt-1}} + \hat{c}\frac{PPE_{jt}}{TA_{jt-1}} + \hat{d}ROA_{jt}\right), \quad (4)$$

where the hats over the coefficients denote estimated values from regression Equation (3). ΔRec_{jt} is the change in accounts receivable from the prior year. The inclusion of ΔRec_{jt} in Equation (4) is the standard modification of the Jones model. Following Hutton et al. (2009), we use the variable *OPAQUE* as a measure of opacity in financial reports. It is calculated as the three-year moving sum of the fractional ranking of the absolute value of discretionary accruals for firm j.[9] Thus,

$$OPAQUE = \text{rank}(|DACC_{t-1}|) + \text{rank}(|DACC_{t-2}|) + \text{rank}(|DACC_{t-3}|). \quad (5)$$

For each year, we construct the quintile portfolios based on *OPAQUE* and calculate the equally weighted average stock returns for each portfolio.

4.2.2. Quality of Audit Firms and Audit Opinions. We collect data concerning audit firms and audit opinions from 1999. Prior to that date, the audit firms were mostly affiliated with government institutions or government-controlled bodies and were perceived as lacking audit independence and professionalism (Chan et al. 2006). *BIG* 4 is a dummy variable that is set equal to 1 if the auditor is one of the Big 4 firms, and *OPIN* is a dummy variable that is set equal to 1 if the audit opinion is qualified, negative, or a disclaimer. We classify these audit opinions as nonclean opinions. There are only a small proportion of publicly traded firms in China that hire Big 4 auditors (they account for only 6.58% of firm-year observations), and only a small proportion of listed firms receive nonclean audit opinions. These firms may have specific

[7] The *A*-share markets (one in Shanghai and one in Shenzhen) are open to domestic investors. In contrast, the *B*-share market is open to investors with access to foreign currencies (e.g., U.S. or Hong Kong dollars) and it is very small compared to the *A*-share markets.

[8] We require each industry to have at least 20 observations in any given year.

[9] Publicly listed firms in China have been required to provide the cash flow statement since 1998, so we follow Jones (1991) to *indirectly* estimate total accruals prior to 1998 and directly calculate total accruals as the difference between net income and operating cash flow after 1998. We use the fractional ranking of |DACC| within each year instead of its value to account for this difference when we compute *OPAQUE*. A fractional ranking is the raw rank divided by the number of observations. For example, the fractional rankings of 1 and 10 among the numbers 1 to 10 are 0.1 and 1, respectively.

characteristics that are also related to the sensitivity to market sentiment, and this can lead to selection biases. To reduce the possible selection biases, we use propensity score matching to construct control samples. First, we run a logit regression to predict auditor choices/opinions. We include firm characteristics that have been shown in previous studies to be associated with auditor choices/opinions in China (Chan et al. 2006, Chen et al. 2010), such as size, leverage, ROA, and ownership concentration. The coefficients from running the regression are consistent with the results obtained in previous studies.[10] Large firms, firms with more ownership controlled by a dominant investor, and cross-listed firms are more likely to hire a Big 4 auditor. State-owned firms and firms with high leverage are less likely to hire Big 4 auditors. Also, we find that small, old, or loss firms and firms with higher leverage or a higher percentage of accounts receivable are more likely to receive nonclean audit opinions. State-controlled firms (SOEs) are less likely to receive nonclean audit opinions, consistent with the notion that SOEs often use political influences to obtain a clean audit opinion.

We use the predicted values from the logit regression (propensity scores) to construct a nearest-neighbor matched sample for the firms audited by the one of the Big 4 and for firms with nonclean audit opinions. In each year, we choose, with replacement, the firms audited by local auditors (firms with clean audit opinions) with propensity scores closest to those of each firm audited by the Big 4 (firms with nonclean audit opinions). These observations constitute the control samples that we use in our sentiment effect tests based on auditor reputation (Big 4, non-Big 4) and audit report (clean, nonclean).

4.2.3. Related-Party Transactions. We expect that the complexities involved in valuing RPTs are related to the magnitude as well as to the number of RPTs. We capture the magnitude of RPTs by the level of abnormal RPTs. Following Jian and Wong (2010), we use an OLS regression model to remove the normal components of related-party transactions that are associated with the following firm characteristics: size, measured by the natural logarithm of total assets (*TA*); leverage, measured by total debt over total assets (*LEV*); and growth, measured by market-to-book equity (*MB*). We also control for industry fixed effects using the 13-industry classification of the CSRC. The equation is

$$RPT_{jt}/SALE_{jt} = \mu_1 + \mu_2 TA_{jt} + \mu_3 LEV_{jt} + \mu_4 MB_{jt} + \text{industry fixed effects} + \varepsilon_{jt}, \quad (6)$$

where RPT_{jt} is the value of related-party transactions that firm j discloses in its annual report at year t; we use the residual from this regression as our proxy for abnormal RPTs. We divide the estimated abnormal RPT_{jt} by the firm's sales volume to further mitigate the firm size effect.

We also capture the complexity of RPTs by using the number of RPT transactions that a firm has in a given year. We argue that a firm with one incidence of RPT would be easier to value than a firm with a dozen RPTs. To form a complexity measure of RPTs (CRPT) that captures both the magnitude and the number of transactions, we first rank firms according to the number of RPTs and the size of abnormal RPTs, respectively, and then sum up two rankings for each firm and use the resulting composite complexity fractional ranking (CRPT) as the basis to divide firms into portfolios.

4.2.4. State Ownership. In China, each listed company has a dominant owner that typically owns more than 30% of the outstanding shares, whereas the second largest stock owner typically owns 10% or less of the shares (Chen et al. 2009). These dominant owners can have a major influence on the quality and transparency of a firm's disclosures. Researchers typically break down firms on the basis of whether the dominant stockholder is a private person or an entity or organ of the central or local government. In light of this ownership feature, we separate listed firms into two ownership categories: (1) privately controlled firms, whose dominant or controlling owner is a nongovernment unit such as entrepreneurs, townships and villages, and foreign companies, and (2) SOEs, whose dominant owner is a government-related entity. In constructing this classification we take great care to identify the true or ultimate owner (i.e., we go behind nominee names to identify the real controlling stockholder). We obtain ultimate ownership information from firms' annual reports for years since 2003 and manually collect the data of the ultimate owners for years prior to 2003.

4.2.5. The Characteristics of Stock Returns and Key Measures of Corporate Transparency. Table 3 presents the descriptive statistics for our variables. The mean monthly return is 2.1% with a median of 0.73%. The average stock returns increase as the accumulation period lengthens. Most firms are profitable (positive ROA), and there is active trading in the firms' shares (the mean stock turnover (*LIQ*) is 0.516, indicating that shares change hands frequently). Approximately 72% of firm-year observations are for state-controlled listed firms. The summary statistics for *DACC*, *OPAQUE*, the number of RPTs, *RPT/Sales*, and *CRPT* all show substantial variability across firms. The mean number of RPTs per firm, per year, is 13.2. Big 4 audit firms audit 6.6% of firm-year observations, and 4.2% of observations have nonclean audit opinions. Panel B of Table 3 shows the means and standard

[10] The detailed regression results are available from the authors upon request.

Table 3 Summary Statistics of Returns, Firm Characteristics, and Transparency, and *SENT* and Macroeconomic Variables

Panel A: Summary statistics of stock returns, firm characteristics, and transparency

	Mean	SD	P25	Median	P75
Stock returns					
R	0.021	0.172	−0.067	0.0073	0.093
$R_{9\text{-month}}$	0.162	0.537	−0.193	0.0781	0.463
$R_{12\text{-month}}$	0.210	0.633	−0.238	0.0769	0.597
$R_{15\text{-month}}$	0.258	0.695	−0.248	0.121	0.679
Firm characteristics					
Ln(*ME*)	13.669	1.007	12.991	13.576	14.220
AGE	6.791	3.380	4.000	6.000	9.000
RISK	0.131	0.077	0.086	0.116	0.162
ROA	0.016	0.093	0.008	0.029	0.054
Dividend	0.464	0.499	0.000	0.000	1.000
BM	1.007	1.150	0.401	0.743	1.358
GS	0.231	0.638	−0.031	0.135	0.335
EF/A	0.066	0.227	−0.019	0.073	0.179
LIQ	0.516	0.392	0.219	0.408	0.694
Transparency measures					
Private	0.283	0.451	0	0	1
SOE (*all*)	0.717	0.451	0	1	1
SOE (*local*)	0.536	0.499	0	1	1
SOE (*central*)	0.181	0.385	0	0	0
DACC	−0.001	0.087	−0.044	−0.001	0.040
OPAQUE	1.497	0.571	1.079	1.481	1.903
BIG 4	0.066	0.241	0	0	0
OPIN	0.042	0.200	0	0	0
No. RPT	13.196	16.795	3.000	8.000	17.000
RPT/Sale	0.611	2.796	0.036	0.212	0.590
CRPT	1.000	0.483	0.608	1.009	1.387

Panel B: Summary statistics and correlations of *SENT* and the control variables

	Mean	SD	P25	Median	P75
SENT	0.000	1.000	−0.842	−0.175	0.610
EP (%)	0.086	0.026	0.059	0.087	0.097
RF (%)	0.207	0.055	0.188	0.188	0.210
INFL (%)	1.565	2.546	−0.300	1.200	2.800
MKT	0.013	0.096	−0.050	0.012	0.061
SMB	0.006	0.042	−0.018	0.008	0.032
HML	0.004	0.027	−0.009	0.003	0.020

	SENT	*EP*	*RF*	*INFL*	*MKT*	*SMB*
Correlations						
EP (%)	−0.05					
RF (%)	0.18**	−0.11				
INFL (%)	0.00	0.04	0.56*			
MKT	0.12	0.25*	−0.09	0.21**		
SMB	0.15***	−0.05	0.03	0.02	0.07	
HML	−0.03	−0.01	−0.06	0.11	0.00	−0.02

Notes. *R* is monthly returns. $R_{9\text{-month}}$, $R_{12\text{-month}}$, and $R_{15\text{-month}}$ are cumulative returns over the 9-month, 12-month, and 15-month horizons, respectively. Ln(*ME*) refers to the log of market value in thousand RMB. *AGE* is the number of years since the firm was listed. *RISK* is stock return volatility over one year. *ROA* is net income divided by total assets. *Dividend* is a dummy variable coded 1 if the firm pays a dividend in the financial year. *BM* refers to the book-to-market ratio. *GS* is the annual growth in sales. *EF/A* is the growth in external financing divided by total assets. *LIQ* is the monthly trading volume divided by the firm's market value of equity. *Private*, *SOE* (*all*), *SOE* (*local*), and *SOE* (*central*) are ownership variables representing whether the controlling stock owner is a private investor, the state, the local city or municipal government, or the central government or its ministries, respectively. *DACC* is a firm's discretionary accruals. *OPAQUE* is the fractional ranking measure of a firm's opaqueness based on the discretionary accruals. *BIG* 4 is equal to 1 if a listed firm hires a Big 4 auditor, and 0 otherwise. *OPIN* is equal to 1 if a listed firm receives a qualified, negative, or disclaimer audit opinion, and 0 otherwise. *No. RPT* is the number of related-party transactions reported by a firm in a year. *RPT/Sale* is a measure of abnormal RPTs scaled by sales. *CRPT* is the complexity of RPTs based on fractional ranking of the number of RPTs and *RPT/Sales*. *SENT* is the investor sentiment index. *EP* is the market-level earnings-to-price ratio. *RF* is the risk-free rate, measured by the monthly interest rate on one-year fixed deposits. *INFL* is the monthly rate of inflation. *MKT*, *SMB*, and *HML* are three factor-mimicking portfolios constructed following the Fama and French (1993) methodology for all nonfinancial listed firms in China. *MKT* is the excess return on the market portfolio of stocks. *SMB* (*HML*) is the difference, each month, between average returns on the small-stock portfolio (the high BM portfolio) and average returns on the large-stock portfolio (the low BM portfolio).

*Statistically significanct at the 1%; **statistically significant at the 5% level; ***statistically significant at the 10% level.

Table 4 Correlations Among Firm Characteristics and Transparency Measures

Pearson\Spearman	Ln(*ME*)	*Age*	*Risk*	*ROA*	*Dividend*	*BM*	*GS*	*EF/A*	*OPAQUE*	*State*	*CRPT*	*Liquidity*
Ln(*ME*)		0.11	0.18	0.39	0.34	−0.10	0.18	0.27	0.03	0.10	0.20	−0.03
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)
Age	0.21		0.25	−0.14	−0.12	−0.14	−0.05	−0.14	−0.03	−0.06	0.00	0.25
	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.66)	(0.00)
Risk	0.23	0.26		−0.02	−0.13	−0.42	−0.01	−0.05	0.00	−0.08	0.00	0.53
	(0.00)	(0.00)		(0.02)	(0.00)	(0.00)	(0.15)	(0.00)	(0.99)	(0.00)	(0.91)	(0.00)
ROA	0.32	−0.08	−0.01		0.51	−0.05	0.32	0.39	0.08	0.04	0.05	−0.07
	(0.00)	(0.00)	(0.37)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Dividend	0.23	−0.16	−0.13	0.36		0.13	0.22	0.29	0.02	0.11	0.11	−0.12
	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)
BM	−0.09	−0.07	−0.20	0.05	0.09		0.06	0.07	−0.07	0.16	0.13	−0.41
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
GS	0.07	−0.02	0.05	0.22	0.10	−0.01		0.43	0.02	0.01	0.04	−0.04
	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)	(0.40)		(0.00)	(0.04)	(0.26)	(0.00)	(0.00)
EF/A	0.28	−0.10	−0.02	0.55	0.26	0.06	0.34		0.07	0.01	0.08	−0.08
	(0.00)	(0.00)	(0.07)	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	(0.46)	(0.00)	(0.00)
OPAQUE	0.03	−0.01	0.03	0.03	0.03	−0.09	0.05	0.05		−0.09	0.01	−0.02
	(0.00)	(0.51)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	(0.25)	(0.10)
State	0.08	−0.05	−0.09	0.07	0.11	0.13	−0.02	0.04	−0.09		0.14	−0.17
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)		(0.00)	(0.00)
CRPT	0.21	0.00	−0.01	0.07	0.11	0.12	0.01	0.07	0.01	0.14		−0.05
	(0.00)	(0.79)	(0.32)	(0.00)	(0.00)	(0.00)	(0.11)	(0.00)	(0.19)	(0.00)		(0.00)
Liquidity	−0.02	0.25	0.37	−0.06	−0.14	−0.23	−0.02	−0.06	−0.02	−0.19	−0.08	
	(0.06)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.08)	(0.00)	(0.00)	

Notes. Pearson correlations are in the lower diagonal and Spearman correlations are in the upper diagonal. Because we use propensity score matching to control for firm characteristics when we examine whether Big 4 auditors and audit opinions mitigate or enhance sentiment effect, we did not include *BIG* 4 and *OPIN* in the correlation table. See Table 3 for variable descriptions.

deviations of *SENT* and macroeconomic variables. By construction, *SENT* has a mean of zero and a standard deviation of one. Panel B of Table 3 also shows the correlations among *SENT* and the macroeconomic variables. This shows that the correlations between *SENT* and the control variables are either moderate or insignificant.

Table 4 shows the correlations among firm characteristics as investigated by Baker and Wurgler (2006) and our transparency measures. As can been seen from the table, the correlations among firm characteristics and our transparency measures are low. The results indicate that our corporate transparency variables are not alternative representations of the firm characteristics as investigated by Baker and Wurgler (2006). Firm size is positively related with *OPAQUE*, state ownership, and RPTs, and is negatively related to liquidity; however, the correlation coefficients are quite small.

4.3. Regression Models

To examine the impact of investor sentiment on stock prices, we regress future cumulative returns on sentiment and control variables. Because the results in panel B of Table 1 suggest that significant market reversion starts from the 12-month horizon, we choose three specific horizons of 9, 12, and 15 months to observe the association between sentiment level and subsequent returns.

Following Brown and Cliff (2005), we examine the association between investor sentiment and subsequent stock returns after controlling for *EP*, *RF*, *INFL*, as well as the three Fama and French (1993) factors (*MKT*, *SMB*, and *HML*). Rouwenhorst (1999) documents that emerging markets, similar to developed markets, exhibit the well-documented equity return patterns of small stocks outperforming large stocks and value stocks outperforming growth stocks. Wang and Di Iorio (2007) and Eun and Huang (2007) confirm the findings of Rouwenhorst (1999) using data from the Chinese equity markets. The regression model for estimating the sentiment effect is

$$\sum_{k=1}^{K}[ExRET_{t+k}] = \alpha + \beta SENT_t + \gamma_1 EP_t + \gamma_2 RF_t + \gamma_3 INFL_t + \gamma_4 MKT_t + \gamma_5 SMB_t + \gamma_6 HML_t + \varepsilon_{t+k}, \quad (7)$$

where $\sum_{k=1}^{K}[ExRET_{t+k}]$ is the k-period portfolio return, and *SENT* refers to the sentiment index. *EP* is the market-level earnings-to-price ratio. *RF* is the risk-free rate, measured by the monthly interest rate on one-year fixed deposits. *INFL* is the monthly rate of inflation. *MKT* is the excess return on the market portfolio, and *SMB* (*HML*) is the difference between the average returns on the small-stock (high BM) portfolio and average returns on the large-stock (low BM) portfolio.

The coefficient β indicates the sensitivity of expected subsequent returns to investor sentiment. Because high (low) sentiment predicts upward (downward) pressure on stock prices followed by a reversion to fundamentals, β is expected to be negative.

4.4. Empirical Results

We carry out the regression model estimation for each set of portfolios sorted by our proxies for corporate transparency. Tables 5–8 summarize the *SENT* coefficient estimation results on our measures of financial information quality. For brevity's sake, we do not report the coefficients for *EP*, *RF*, *INFL*, *MKT*, *SMB*, and *HML* because they are not the prime focus of our study. We match *OPAQUE*, audit opinion (*OPIN*), and *CRPT* for fiscal year-ends in calendar year $t-1$ to monthly returns from July in year t through June in year $t+1$ to ensure that the variables are known before the returns they are used to explain. Type of ownership (*OWN*) and *BIG* 4 in year t are matched to monthly returns from July in year t through June in year $t+1$, since significant events, such as change in auditor or the ultimate controlling owners, are reported to the regulator (the CSRC) and the stock market within two days after their occurrence. We form equal-weighted quintile portfolios according to *OPAQUE* and *CRPT* and construct pair portfolios based on the discrete variables *BIG* 4, *OPIN*, and *OWN*.

Table 5 reports the results of accruals management (*OPAQUE*). The firms are divided into quintile segments, with Q1 consisting of firms with the lowest *OPAQUE* score. In contrast, firms in Q5 have the highest *OPAQUE* score. In line with the aforementioned results of market reversals shown in panel B of Table 1, the bias-adjusted coefficient estimates of *SENT* over the three horizons are universally negative and all are significant over the 12- and 15-month horizons. The differences between the *SENT* coefficients in Q5 and Q1 are statistically significant across all three horizons. The results are also very significant in economic terms. For example, if we look at the 12-month horizon, an increase of one standard deviation in market over optimism (i.e., positive sentiment index) results in an additional 250 basis points decline in the market value of firms with high opaqueness over those with low opaqueness in the subsequent 12-month period. These results support our hypothesis that firms with high *OPAQUE* scores are more vulnerable to investor sentiment changes than are firms with low *OPAQUE* scores.

Panel A of Table 6 shows the results for audit opinions. The *SENT* coefficients on the portfolio with nonclean audit opinions are considerably lower than those on the matched firm portfolio with clean opinions, and the differences are all statistically significant at the 1% level across the three horizons.[11] This evidence suggests that firms that receive qualified, negative, or disclaimer audit opinions are more sensitive to investor sentiment than are their clean audit opinion counterparts. The economic significance is compelling. If we look at the 12-month horizon, firms that receive a nonclean audit opinion have to bear an extra 330 basis point cumulative decline in their market value compared to their clean report control firms for a one standard deviation change in market over optimism (i.e., positive sentiment index). This finding is consistent with that of Choi and Jeter (1992), who find that modified audit opinions are associated with clients that have noisier or less persistent (or both) financial information.

The results on auditor choice are summarized in panel B of Table 6. As we expect, the *SENT* coefficients for firms with Big 4 auditors are considerably higher (i.e., less negative) than those of their control counterparts, and their differences are all statistically significant at the 1% level across the three time horizons. This evidence supports our hypothesis that firms can reduce market uncertainty and hence reduce their vulnerability to sentiment through hiring a prestigious international auditor with a strong reputation for independence and a high level of professionalism.

Table 5 Sentiment Effects and Accruals Management (*OPAQUE*)

Q1 (low)	Q2	Q3	Q4	Q5 (high)	Q5 − Q1
		9-month horizon			
−0.061	−0.064	−0.076	−0.069	−0.081	−0.020
(0.15)	(0.14)	(0.10)	(0.14)	(0.08)	(0.00)
		12-month horizon			
−0.121	−0.124	−0.138	−0.131	−0.146	−0.025
(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
		15-month horizon			
−0.151	−0.156	−0.168	−0.161	−0.175	−0.023
(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Notes. Regressions of portfolio returns from t to $t+k$ on the sentiment index (*SENT*), the market earnings-to-price ratio (*EP*), the risk-free rate (*RF*), the inflation rate (*INFL*), and the three Fama–French factors (*MKT*, *SMB*, and *HML*) are shown. The equation is

$$\sum_{k=1}^{K}[RET_{t+k}] = \alpha + \beta SENT_t + \gamma_1 EP_t + \gamma_2 RF_t + \gamma_3 INFL_t + \gamma_4 MKT_t + \gamma_5 SMB_t + \gamma_6 \mathrm{HML}_t + \varepsilon_{t+k}.$$

We report the coefficient on *SENT* for each equal-weighted quintile portfolio formed on *OPAQUE*. *OPAQUE* is the three-year moving sum of the ranking of the absolute value of discretionary accruals for firm j. Q5–Q1 represent the differences of average stock returns between the top quintile (Q5) and the bottom quintile (Q1). Simulated p-values are reported in parentheses and are for two-sided tests for the hypothesis that the slope coefficient β does not equal 0.

[11] As a robustness check, we exclude the observations with disclaimer audit opinions and focus on qualified/negative-opinion firms. We find that our results still hold.

Table 6 Sentiment Effects and Audit Firms and Audit Opinions

	Panel A: Nonclean vs. clean opinions			Panel B: Big 4 vs. local auditors		
Horizons	Nonclean	clean	Nonclean − clean	Big 4	Local	Local − Big 4
9-month	−0.116	−0.085	−0.032	−0.068	−0.088	−0.020
	(0.03)	(0.10)	(0.00)	(0.07)	(0.02)	(0.00)
12-month	−0.191	−0.158	−0.033	−0.125	−0.151	−0.026
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
15-month	−0.226	−0.186	−0.039	−0.161	−0.184	−0.023
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Notes. Regressions of portfolio returns from t to $t+k$ on the sentiment index (*SENT*), the market earnings-to-price ratio (*EP*), the risk-free rate (*RF*), the inflation rate (*INFL*), and the three Fama–French factors (*MKT*, *SMB*, and *HML*) are shown. The equation is

$$\sum_{k=1}^{K}[RET_{t+k}] = \alpha + \beta SENT_t + \gamma_1 EP_t + \gamma_2 RF_t + \gamma_3 INFL_t + \gamma_4 MKT_t + \gamma_5 SMB_t + \gamma_6 HML_t + \varepsilon_{t+k}.$$

We report the coefficient on *SENT* for each equal-weighted portfolio aggregated by auditor choice and audit opinions. "Big 4" refers to the portfolio of all firms audited by Big 4 auditors. Firms audited by local auditors (Local) are chosen using a nearest-neighbor propensity score with controls for firm characteristics associated with auditor choices. Nonclean refers to the portfolio of all firms with nonclean audit opinions (i.e., qualified, negative, or disclaimer). Firms with unqualified audit opinions (Clean) are chosen using a nearest-neighbor propensity score with controls for firm characteristics associated with the likelihood of receiving a nonclean audit opinion. Simulated p-values are in parentheses and are for two-sided tests for the hypothesis that the slope coefficient β does not equal 0.

Table 7 Sentiment Effects and Related-Party Transactions (CRPTs)

Q1 (low)	Q2	Q3	Q4	Q5 (high)	Q5 − Q1
		9-month horizon			
−0.062	−0.070	−0.070	−0.072	−0.074	−0.012
(0.19)	(0.12)	(0.09)	(0.08)	(0.09)	(0.01)
		12-month horizon			
−0.123	−0.131	−0.132	−0.135	−0.136	−0.013
(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
		15-month horizon			
−0.153	−0.162	−0.166	−0.165	−0.164	−0.012
(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Notes. Regressions of portfolio returns from t to $t+k$ on the sentiment index (*SENT*), the market earnings-to-price ratio (*EP*), the risk-free rate (*RF*), the inflation rate (*INFL*), and the three Fama–French factors (*MKT*, *SMB*, and *HML*) are shown. The equation is

$$\sum_{k=1}^{K}[RET_{t+k}] = \alpha + \beta SENT_t + \gamma_1 EP_t + \gamma_2 RF_t + \gamma_3 INFL_t + \gamma_4 MKT_t + \gamma_5 SMB_t + \gamma_6 HML_t + \varepsilon_{t+k}.$$

We report the coefficient on *SENT* for each equal-weighted quintile portfolio formed on the complexity index of related-party transactions. The complexity of RPTs for firm j is the sum of the ranking of abnormal RPTs and the ranking of the number of RPTs. Q1 refers to firms with the value of CRPT in the bottom quintile. Q5 refers to firms with the value of CRPT in the top quintile. We report the coefficient on *SENT* for each quintile. Simulated p-values are in parentheses and are for two-sided tests for the hypothesis that the slope coefficient β does not equal 0.

The results for RPTs are presented in Table 7. We use a composite complexity index (CRPT) to capture the magnitude and number of RPTs. Firm-level CRPTs are sorted into five quintiles (Q1 to Q5), with firms in Q1 having the lowest CRPTs. The *SENT* coefficients generally become more negative as CRPTs increase. The high-minus-low analysis shows a significant difference on the *SENT* coefficients between Q5 and Q1. Consistent with our hypothesis, the results indicate that the sentiment effects on firm valuation increase as CRPTs increase.

Table 8 reports the results on the firm's type of controlling shareholder. We first divide all publicly listed firms into SOEs and private firms. Across three horizons, we consistently find that the *SENT* coefficients on SOEs are more negative than those on private firms. The SOE-minus-private portfolio comparison suggests that the differences in the *SENT* coefficients are highly significant. The evidence supports Hypothesis 5. State-controlled listed firms are likely to be less transparent and thus have a higher exposure to sentiment.

Notwithstanding the general nature of state control, Chen et al. (2009) argue that the different types of state owners have somewhat different objectives, and this can affect the performance and actions of the listed firms they control. In particular, local government control, where the listed firm's major shareholder is a city or municipal government, results in a more market-oriented approach when compared to firms that are controlled by the central government. Thus, we expect that firms that are controlled by the central government will be the least transparent and thus the most susceptible to sentiment, followed by firms controlled by local government, and then privately controlled firms. In light of this, we divide the SOE group into (1) local SOEs, which are controlled by local governments (e.g., the Bureau of State Assets Management and the Municipal Finance Bureau), and (2) central SOEs, which are controlled by the central government (e.g., the Ministry of Finance and the Central Industrial Enterprises Administration Committee). From this partitioning, we obtain two further findings: (1) the *SENT* coefficients in both SOE subgroups are more negative than those of private firms, and the differences are highly significant; and (2) the *SENT* coefficients for central SOEs are more negative than those for local SOEs, with the differences being significant at the 1% level across all three horizons. The results support our hypothesis that SOEs are more vulnerable to investor sentiment shifts than private firms and that central SOEs are more affected by sentiment than local SOEs.

4.5. Additional Findings and Robustness Checks

4.5.1. Liquidity as an Alternative Measure of Transparency. Prior research finds that share turnover is a proxy for information asymmetry since information

Table 8 Sentiment Effects and State Ownership

Private	SOE	Local SOE	Central SOE	SOE – Private	Local SOE – Private	Central SOE – Private	Central SOE – Local SOE
				9-month horizon			
−0.040	−0.050	−0.046	−0.059	−0.010	−0.006	−0.020	−0.014
(0.48)	(0.33)	(0.36)	(0.19)	(0.01)	(0.06)	(0.00)	(0.00)
				12-month horizon			
−0.099	−0.108	−0.104	−0.119	−0.009	−0.006	−0.020	−0.014
(0.07)	(0.02)	(0.02)	(0.01)	(0.05)	(0.08)	(0.01)	(0.00)
				15-month horizon			
−0.121	−0.134	−0.130	−0.144	−0.014	−0.011	−0.024	−0.013
(0.02)	(0.00)	(0.00)	(0.00)	(0.02)	(0.03)	(0.01)	(0.01)

Notes. Regressions of portfolio returns from t to $t+k$ on the sentiment index (*SENT*), the market earnings-to-price ratio (*EP*), the risk-free rate (*RF*), the inflation rate (*INFL*), and the three Fama–French factors (*MKT*, *SMB*, and *HML*) are shown. The equation is

$$\sum_{k=1}^{K}[RET_{t+k}] = \alpha + \beta SENT_t + \gamma_1 EP_t + \gamma_2 RF_t + \gamma_3 INFL_t + \gamma_4 MKT_t + \gamma_5 SMB_t + \gamma_6 HML_t + \varepsilon_{t+k}.$$

We report the coefficient on *SENT* for each equal-weighted portfolio formed on a firm's ultimate owner. "SOE" refers to the listed firms ultimately controlled by local or central government, whereas "private" refers to the privately controlled listed firms. Local SOEs are defined as SOEs owned by local governments (e.g., the Bureau of State Assets Management and the Municipal Finance Bureau), and central SOEs are defined as SOEs owned by the central government (e.g., the Ministry of Finance and the Central Industrial Enterprises Administration Committee). Simulated p-values are in parentheses and are for two-sided tests for the hypothesis that the slope coefficient β does not equal 0.

asymmetry between more informed and less informed investors reduces expected liquidity in the market for a firm's shares (e.g., Glosten and Milgrom 1985, Merton 1987). In a recent study, Lang et al. (2012) found that greater transparency is significantly associated with higher liquidity, and the relation is particularly strong in countries where disclosure requirements are weak. Therefore, to further test our argument that corporate transparency is a determinant of firm-level sentiment effects, we calculate the association between liquidity and the cross-sectional effects of sentiment. Stock turnover (*LIQ*) is calculated as the aggregate monthly volume of trade divided by the market value of equity over the past 12 months ending in June of year t and matched to monthly returns from July of year t through June of year $t+1$. The results shown in Table 9 indicate that the most "liquid" quintile has the smallest *SENT* coefficients, and the differences in β between the most liquid and the most illiquid quintiles are all significant at the 1% level. These results indicate that the most liquid stocks are less sensitive to shifts in investor sentiment, consistent with our conjecture that greater sentiment effects are associated with higher information asymmetry between insiders and outside investors.

4.5.2. Subsample Period Analysis. China's stock market experienced a sharp increase followed by a major collapse in the 2007–2008 period. During this period, stock prices more than doubled and subsequently fell by more than 50%. Although this bubble period is a particularly important and useful period for detecting the investor sentiment effects, it is important for us to examine whether our results are completely driven by this period when sentiment effects are likely to be particularly high. This allows us to test the generalizability of our results under different sentiment scenarios.

To examine this issue, we rerun our tests to cover the sample period 1999–2005 (we need an extra one year of stock returns to examine the subsequent price reversal). We find that the market reversal during the 1999–2005 sample period becomes statistically significant at the 14th month (rather than in month 12, as reported for the whole sample period, 1999–2009). Table 10 shows the *SENT* coefficient estimation results on our corporate

Table 9 Sentiment Effects and Liquidity

Q1 (low)	Q2	Q3	Q4	Q5 (high)	Q5 – Q1
			9-month		
−0.051	−0.057	−0.056	−0.046	−0.024	0.026
(0.24)	(0.23)	(0.30)	(0.41)	(0.68)	(0.00)
			12-month		
−0.109	−0.117	−0.117	−0.106	−0.082	0.026
(0.02)	(0.01)	(0.02)	(0.03)	(0.10)	(0.01)
			15-month		
−0.137	−0.140	−0.141	−0.128	−0.098	0.039
(0.00)	(0.00)	(0.00)	(0.01)	(0.03)	(0.00)

Notes. Regressions of portfolio returns from t to $t+k$ on the sentiment index (*SENT*), the market earnings-to-price ratio (*EP*), the risk-free rate (*RF*), the inflation rate (*INFL*), and the three Fama–French factors (*MKT*, *SMB*, and *HML*) are shown. The equation is

$$\sum_{k=1}^{K}[RET_{t+k}] = \alpha + \beta SENT_t + \gamma_1 EP_t + \gamma_2 RF_t + \gamma_3 INFL_t + \gamma_4 MKT_t + \gamma_5 SMB_t + \gamma_6 HML_t + \varepsilon_{t+k}.$$

We report the coefficient on *SENT* for each equal-weighted quintile portfolio formed on liquidity. Liquidity is the monthly trading volume divided by the firm's market value of equity. Simulated p-values are in parentheses and are for two-sided tests for the hypothesis that the slope coefficient β does not equal 0.

Table 10 Full-Period (1999–2009) and Subperiod Tests (1999–2005)

	12-month		15-month	
	1999–2005	1999–2009	1999–2005	1999–2009
OPAQUE: Q5–Q1	−0.028 (0.00)	−0.025 (0.000)	−0.028 (0.00)	−0.023 (0.00)
Audit opinion: Nonclean–clean	−0.013 (0.03)	−0.033 (0.00)	−0.007 (0.10)	−0.039 (0.00)
Audit firm: Local–Big 4	−0.027 (0.00)	−0.026 (0.00)	−0.17 (0.05)	−0.023 (0.00)
CRPT: Q5–Q1	−0.009 (0.04)	−0.013 (0.00)	−0.009 (0.00)	−0.012 (0.00)
State ownership: SOE–private	−0.023 (0.00)	−0.009 (0.05)	−0.027 (0.00)	−0.014 (0.02)
State ownership: Local–private	−0.018 (0.01)	−0.006 (0.08)	−0.022 (0.00)	−0.011 (0.03)
State ownership: Central–private	−0.044 (0.00)	−0.020 (0.01)	−0.046 (0.00)	−0.014 (0.00)
State ownership: Central–local	−0.032 (0.00)	−0.014 (0.00)	−0.024 (0.00)	−0.013 (0.01)
LIQ: Q5–Q1	0.043 (0.00)	0.026 (0.01)	0.055 (0.00)	0.039 (0.00)

Notes. See Tables 5–9 for the definitions of *OPAQUE*, *Audit opinion*, *Audit firm*, *CRPT*, *Ownership*, and *LIQ*. The table shows the differences in sentiment coefficients between high (5) and low (1) scores for *OPAQUE*, *CRPT*, and *LIQ* or between different types of audit opinions, audit firm size, and ownership. The *p*-values are in parentheses.

transparency variables for the 1999–2005 period.[12] The summary results for the full sample (1999–2009), extracted from Tables 5–9 and 11, are also included as a comparison. We only focus on the 12-month and 15-month horizons because it takes longer to observe market reversal. The coefficients on *SENT* for 1999–2005 are not much different from those for 1999–2009. Transparent firms (as measured by all of our proxies) are still less likely to be affected by investor sentiment than are nontransparent firms during period 1999–2005. The results suggest that the evidence we report in Tables 5–9 and 11 is not completely driven by the major bull and bear market episode in 2007–2008.

4.5.3. An Aggregate Measure of Transparency. The use of any one structural variable (e.g., auditor, RPTs) can produce measurement errors in separating transparent from nontransparent firms. One way to reduce measurement error is to construct an aggregate score of transparency. To construct this aggregate measure, we sum the six transparency measures previously examined (opacity in financial reports, auditor, audit opinion, the complexity of related-party transactions, state ownership, and stock trading liquidity). Because the variables have different scales, we recalibrate them as zero or one. Financial reporting opacity and related-party transactions are coded 1 if the magnitudes of *OPAQUE* and *CRPT* for firm *j* are below the medians for the year. *LIQ* is coded 1 if firm *j*'s stock turnover is above the median for the year. A Big 4 auditor is coded 1, whereas a local auditor is coded 0; an unqualified opinion is coded 1, whereas a nonclean opinion is coded 0; and a privately controlled listed firm is coded 1, whereas a state-controlled firm is coded 0. The highest possible score (indicating a high level of transparency) is 6, and the lowest possible score is 0. The firm-year observations are grouped into three equal-size portfolios: high transparency, middle transparency, and low transparency.

[12] The results in Table 10 show the differences in *SENT* coefficients between quintiles 5 and 1 or differences in *SENT* coefficients between clean and no-clean audit opinions, Big 4 and non-Big 4 auditors, and ownership type. The more detailed results (which reflect the level of detail in Tables 5–9 and 11) are available upon request.

Table 11 Sentiment Effects and an Aggregated Measure of Transparency

	Low	Medium	High	High − Low
9-month				
β	−0.079	−0.071	−0.051	0.027
p-value	(0.06)	(0.11)	(0.27)	0.00
12-month				
β	−0.143	−0.129	−0.112	0.030
p-value	(0.00)	(0.01)	(0.02)	(0.00)
15-month				
β	−0.173	−0.159	−0.143	0.031
p-value	(0.00)	(0.00)	(0.00)	(0.00)

Notes. We construct a simple composite index for firm-level transparency by summing up the scores of six transparency variables: $OPAQUE_{it}$_score ($CRPT_{it}$_score) = 1 if *OPAQUE* (*CRPT*) in firm *i* is *below* the median at year *t* and 0 otherwise. LIQ_{it}_score = 1 if firm *i*'s stock turnover is *above* the median at year *t* and 0 otherwise . $Auditfirm_{it}$_score = 1 if firm *i* is audited by one of the Big 4 and 0 if firm *i* is audited by a local auditor at year *t*. $AuditOP_{it}$_score = 1 if firm *i* receives a unqualified audit opinion at year *t* and 0 otherwise. SOE_{it}_score = 1 if firm *i* is a privately controlled firm and 0 if firm *i* is a state-owned firm. Based on the firms' aggregate scores, we partition them into three equal-weighted portfolios (low, medium, and high) and report the coefficients on *SENT* for equal-weighted portfolios. High refers to more transparent firms. Regressions of portfolio returns from *t* to $t+k$ on the sentiment index (*SENT*), the market earnings-to-price ratio (*EP*), the risk-free rate (*RF*), the inflation rate (*INFL*), and the three Fama–French factors (*MKT*, *SMB*, and *HML*) are shown. The equation is

$$\sum_{k=1}^{K}[RET_{t+k}] = \alpha + \beta SENT_t + \gamma_1 EP_t + \gamma_2 RF_t + \gamma_3 INFL_t + \gamma_4 MKT_t + \gamma_5 SMB_t + \gamma_6 HML_t + \varepsilon_{t+k}.$$

Simulated *p*-values are in parentheses and are for two-sided tests for the hypothesis that the slope coefficient β does not equal 0.

In Table 11, we show the coefficients on *SENT* for the three portfolios, high (i.e., high transparency), middle, and low (i.e., low transparency), and for three time horizons, 9, 12, and 15 months. The results are strong and provide evidence that is consistent with our previous analyses. Specifically, the coefficients on *SENT* are significantly less negative for highly transparent firms than for firms that are not transparent. Thus, investors are more likely to use market sentiment to value less transparent firms.

5. Conclusion

This paper examines investor sentiment and its effects on asset pricing in the context of China's financial markets. Prior research tests sentiment effects in developed markets and finds that the cross-sectional impacts of investor sentiment relate to a firm's characteristics such as size, age, and growth, i.e., factors that affect valuation subjectivity. However, no prior study has systematically investigated the sentiment effects in emerging markets and examined whether corporate transparency, a factor largely determined by the firm's financial reporting implementation and management discretion, can also influence the impact of sentiment on stock prices. We present comprehensive evidence that corporate transparency explains the degree to which general investor sentiment is reflected in a firm's stock price. These findings highlight the importance of a transparent information environment in mitigating sentiment-driven volatility.

Supplemental Material

Supplemental material to this paper is available at http://dx.doi.org/10.1287/mnsc.2014.1911.

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