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China Journal of Accounting Research

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8 | 1 China Journal of Accounting Research Vol. 8/1 (2015) 1–74

ELSEVIER

Volume 8 • Issue 1 • March 2015

China Journal *of* Accounting Research

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Available online at www.sciencedirect.com
ScienceDirect

ISSN 1755-3091

Production and hosting by Elsevier
Radarweg 29, 1043 NX Amsterdam, The Netherlands

ISSN 1755-3091

Founded by Sun Yat-sen University and City University of Hong Kong

Sponsored by: CPA Hong Kong Institute of Certified Public Accountants 香港會計師公會

Published quarterly in March, June, September, and December

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CHINA JOURNAL OF ACCOUNTING RESEARCH

Volume 8/1 (2015)

China Journal of Accounting Research 8 (2015) 1–23

HOSTED BY

Contents lists available at ScienceDirect

China Journal of Accounting Research

journal homepage: www.elsevier.com/locate/cjar

Foreign versus domestic institutional investors in emerging markets: Who contributes more to firm-specific information flow?

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ARTICLE INFO

Article history:
Received 12 December 2014
Accepted 30 December 2014
Available online 23 January 2015

Keywords:
Foreign investors
Institutional trading
Investment horizon
Stock price synchronicity
Korea

ABSTRACT

Using a large sample of firms listed on the Korea Stock Exchange over 1998–2007, this study investigates whether and how trading by foreign and domestic institutional investors improves the extent to which firm-specific information is incorporated into stock prices, captured by stock price synchronicity. We find, first, that stock price synchronicity decreases significantly with the intensity of trading by foreign investors and domestic institutional investors. Second, trading by foreign investors facilitates the incorporation of firm-specific information into stock prices to a greater extent than trading by aggregate domestic institutions. Third, among domestic institutions with differing investment horizons, short-term investing institutions, such as securities and investment trust companies, play a more important role in incorporating firm-specific information into stock prices via their trading activities, compared with long-term investing institutions, such as banks and insurance companies. Finally, we provide evidence suggesting that trading by foreign and domestic short-term institutions reduces the extent of accrual mispricing. Our results are robust to a variety of sensitivity checks.

1. Introduction

The past 25 years have witnessed a growing trend in which many emerging countries have liberalized their stock markets, allowing foreign investors to invest directly in the equity securities of local firms. Foreign access

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http://dx.doi.org/10.1016/j.cjar.2015.01.001
1755-3091/

to domestic equity markets has raised a number of interesting questions related to foreign investors' portfolio choice and performance. An important stream of research in the "home bias" literature investigates firm-specific factors that influence shareholdings by foreign investors. Although barriers to international investment in emerging markets have significantly reduced since market liberalizations, foreign investors may still face indirect barriers (Karolyi and Stulz, 2003). The home bias literature typically posits the information disadvantage of foreign investors, which influences their asset holdings and performance. For example, Kang and Stulz (1997) and Dahlquist and Robertsson (2001), using Japanese and Swedish data, respectively, find that foreign investors hold disproportionately more shares of large firms and firms with greater recognition or visibility in international markets. Bradshaw et al. (2004) find that U.S. investors prefer foreign firms that exhibit higher levels of conformity with U.S. Generally Accepted Accounting Principles. Covrig et al. (2006) find that foreign managers of mutual funds tend to overweight stocks that are globally well known, while domestic managers prefer stocks with large dividend payouts, low financial distress and high growth potential. Similarly, Leuz et al. (2009) provide evidence that U.S. investors are reluctant to invest in foreign firms with aggressive earnings management, especially those from countries with poor disclosure regimes. Overall, these studies suggest that foreigners prefer to invest in stocks with less information uncertainty to overcome their information disadvantages.

Another stream of research focuses on the investment performance of foreign investors vis-à-vis domestic investors and provides mixed evidence. For example, Shukla and Inwegen (1995), Brennan and Cao (1997) and Hau (2001) find evidence that local investors outperform foreign investors. In contrast, Seasholes (2004), Grinblatt and Keloharju (2000), Karolyi (2002) and Froot and Ramadorai (2008) provide evidence suggesting that foreign investors are more informed and outperform their domestic counterparts. In reconciling the mixed evidence on investor performance, Albuquerque et al. (2009) show the presence of global private information that gives an information advantage to international investors who are not as informed as local investors about local private information.

Since the aforementioned studies focus mainly on foreign investors' asset holdings and investment performance, little is known about the role of foreign and domestic institutional investors in influencing the information environment, particularly in emerging markets with less developed institutional infrastructures. To fill this gap, our study aims to provide systematic evidence on the following under-researched questions:

(1) Does trading by foreign and domestic institutional investors improve the flow of firm-specific information to the market?
(2) Do foreign investors play a more significant role in enhancing firm-specific information flow via their trading than domestic institutional investors?
(3) Does the informational role of domestic institutions differ according to their investment horizons?

To address these questions, we first investigate whether the trading of a firm's shares by foreign and local institutional investors improves firm-specific information flow to the market, particularly the extent to which firm-specific information is incorporated into stock prices relative to common (market-wide and/or industry-wide) information. In so doing, we measure the relative amount of firm-specific versus common information incorporated into stock prices, using stock price synchronicity, or co-movement. Lower stock price synchronicity means that stock prices covary with firm-specific factors to a greater extent than with common factors, leading to less synchronous or more informative stock prices (Durnev et al., 2003; Jin and Myers, 2006). To the extent that institutional investors, whether foreign or local, actively collect, process and trade on firm-specific information, we expect that their trading activities facilitate the incorporation of firm-specific information into stock prices, thereby reducing synchronicity.

Second, we examine whether and how foreign investors differ from domestic institutional investors in their roles of influencing the flow of firm-specific information to the market. Given that foreign investors in emerging markets are typically more sophisticated and have an information advantage of global information, it is interesting to examine whether or not our results on the informational effect of trading by foreign investors are driven by the fact that foreign investors are institutional investors. We evaluate this unexplored question by comparing the informational role of foreign trading with that of domestic institutional trading, using the latter as a benchmark.

Finally, we investigate whether domestic institutions with relatively short investment horizons are better able to facilitate firm-specific information flow, compared with domestic institutions with relatively long investment horizons. Previous research finds that the influence of institutional trading on managerial behavior and stock returns differs significantly, according to whether institutional investors are dedicated or transient institutions (Bushee, 1998, 2001) and whether they are short-term investors—who trade more actively—or long-term investors—who trade less actively (Yan and Zhang, 2009). To date, however, little is known about whether institutions with differing investment horizons play different roles in influencing the incorporation of firm-specific information into stock prices. To provide systematic evidence on this issue, we compare the informational role of domestic short-term institutions, such as securities and investment trust companies, with that of domestic long-term institutions, such as banks and insurance companies.

To assess the *firm-level* relation between the amount of firm-specific information incorporated into stock prices and the trading activities of foreign versus domestic institutional investors, we need to obtain firm-level data on trading by foreign and domestic institutional investors in a specific market. This paper takes advantage of the availability of such data in Korea. To our knowledge, Korea is one of few countries, if not the only one, in which detailed data on the shareholdings and trading of equity shares by foreigners and different types of domestic institutions are publicly available for listed companies. Foreigners investing in equity shares listed on the Korea Stock Exchange (KSE) are required to register with the Financial Supervisory Service (FSS). Since 1992, the FSS has kept track of the number of equity shares held by foreign investors and different types of domestic institutions for each stock listed on the KSE.[1] This data availability provides us with a unique setting in which to compare the informational role of foreign investors with that of domestic institutions and allows us to further evaluate any differences between the informational roles of domestic institutions with different investment horizons. In this regard, the Korean equity market is well suited to address our research questions. The Korean regulatory authority completely abolished limits on foreign equity ownership in 1998 (a year after the Korean financial crisis started). We analyze the informational role of foreign and domestic institutional investors in the Korean stock markets for the period 1998–2007, during which foreign ownership constraints were not binding. By limiting our sample to the post-crisis period, we effectively control for the potential effect of foreign ownership constraints, or "investability," on our results.[2]

Briefly, our results reveal the following: First, we document evidence that both foreign and domestic institutional investors play a significant role in facilitating the incorporation of firm-specific information into stock prices. Our regression results show that both types of investors contribute to reducing stock price synchronicity, or co-movement, via their trading activities. Second, we find that the informativeness-enhancing effect of foreign trading is significantly greater than the same effect associated with aggregate domestic institutional trading. This suggests that foreign investors are more actively involved in information-based trading and their trading activities accelerate the flow of firm-specific information into the market.

Third, we find that, among domestic institutions, securities and investment trust companies play a more significant role in facilitating the flow of firm-specific information to the market via their trading, compared with banks and insurance companies. Given that these securities and investment trust companies engage more actively in informed trading for short-term profits than banks and insurance companies, our results are

[1] Foreigners can hold Korean stocks by directly trading them or via indirect trades through foreign institutions. Therefore, there are two types of foreign investors in Korea: (i) foreign individuals who reside in and outside of Korea and (ii) branches/subsidiaries of foreign institutions domiciled in Korea and foreign institutions domiciled outside Korea. While the database we use, KIS-DATA of the Korea Investment Service (KIS), provides information about the aggregate numbers of shares held by "foreign investors" and different types of domestic institutions (i.e., securities companies, investment trust companies, banks, and insurance companies), it does not provide information about the decomposition of shareholdings by different types of foreign investors. However, our discussions with several FSS and KIS officials indicate, without exception, that foreign investors in Korea consist predominantly of foreign institutions. The percentage of shares traded by foreign individual investors participating directly in the Korean equity market is trivial during our sample period and thus the term *foreign investors* in the KIS database can be interpreted as foreign *institutional* investors. In this paper, the terms *foreigners*, *foreign institutional investors* and *foreign institutions* are therefore used interchangeably to refer to foreign investors.

[2] As is common in emerging markets, the foreign ownership limit differs across stocks within a country and across countries. Using an international sample of firms from 33 emerging market countries, Bae et al. (2004) show that the degree to which a stock can be owned by foreigners (or investability) is positively associated with return volatility. Further, Bae et al. (2012) find that greater investability is associated with the more efficient transmission of global market information into stock prices in emerging markets.

consistent with the view that institutional investors with relatively short investment horizons facilitate firm-specific information flow to the market to a greater extent than those with relatively long investment horizons. Finally, we provide evidence that accrual mispricing is mitigated for firms whose shares are actively traded by foreign investors and domestic short-term institutions, suggesting that foreign and domestic short-term institutional trading enhances the information environment of local firms. Overall, our results support the view that foreign investors and domestic short-term institutions engage more actively in information-based trading and thus play a more important role in facilitating the incorporation of firm-specific information into stock prices, compared with domestic long-term institutions.

This paper adds to the existing literature in the following ways. First, while many studies in the home bias literature examine foreign investors' preferences over stock characteristics and their trading patterns (e.g., Kang and Stulz, 1997; Choe et al., 1999; Ahearne et al., 2004; Covrig et al., 2006), they pay little attention to the impact of trading on the information environment in emerging markets. To our knowledge, our study is the first to investigate the impact of foreign trading on the information environment and compare it with that of domestic institutional trading.

Second, prior research suggests that institutional trading is an important channel through which firm-specific information is incorporated into stock prices (e.g., Chakravarty, 2001; Hartzell and Starks, 2003; Piotroski and Roulstone, 2004; Aslan et al., 2007; Ferreira and Laux, 2007). Piotroski and Roulstone (2004) show that firm-specific return variation (an inverse measure of synchronicity) is positively associated with trading by institutional investors. Ferreira and Laux (2007) provide evidence that institutional trading contributes more to the incorporation of private information into the stock prices of firms with greater openness to takeovers. Our study extends the results of Piotroski and Roulstone (2004) and Ferreira and Laux (2007) by offering a finer decomposition of institutional investors. We decompose institutional investors into foreign and domestic institutions and further classify domestic institutions into short-term and long-term investors based on the type of institution. Our analysis contributes to the related literature by adding new evidence that trading by foreign investors and domestic short-term institutions decreases stock price synchronicity or increases the amount of firm-specific information incorporated into stock prices, but trading by domestic long-term institutions does not.

This paper proceeds as follows. Section 2 develops our hypotheses. Section 3 explains the measurement of our research variables and specifies our main regression model. Section 4 describes the sample and data sources. Section 5 presents empirical results, including descriptive statistics and our main regression results. Section 6 presents empirical results using an alternative measure of firm-specific information flows. Section 7 conducts further analysis to examine the informational role of foreign and domestic institutional trading in the context of accrual pricing. The final section presents our conclusions.

2. Hypothesis development

Stock market liberalization in emerging markets facilitates the flow of investment funds from capital-abundant, developed countries to capital-scarce, developing countries. Using aggregate country-level data, several studies in the international finance literature show that this enhanced flow of foreign funds to domestic equity markets contributes to increasing domestic equity market values (Bekaert and Harvey, 2000), reducing the cost of raising equity capital (Stulz, 1999), boosting domestic investments (Henry, 2000) and enhancing financial market development and liquidity (Bekaert et al., 2005). This study argues that a country's stock market liberalization leads to an improvement in the information environment. Increased foreign access to domestic equity markets stimulates more research and information production by local and foreign analysts, brokerages and other market participants. It also spurs local firms to disclose more and better information. For example, local firms are prompted to set up an investor relations department to effectively cope with the ever-increasing demand for detailed information from foreign investors and to provide detailed financial information in foreign languages.[3]

[3] Since LG Electronics first established its investor relations department in 1994, many firms followed suit. Firms increasingly use voluntary disclosure to improve investor relations by communicating directly with investors. In 2007, Korean publicly traded firms, on average, made 1.82 times the number of voluntary disclosures annually (Korea Listed Companies Association).

Stock market liberalization also puts more pressure on securities market regulators to adopt accounting standards, disclosure rules and corporate governance practices that are comparable to international standards. Since opening its equity markets to foreign investors in 1992, the Korean government has made steady efforts to improve corporate transparency. Specifically, after the 1997 Asian financial crisis, the Korea Financial Supervisory Commission made substantial amendments to the Korean financial accounting standards to be more compatible with International Financial Reporting Standards, enhanced auditor independence with the introduction of class action lawsuits and improved corporate governance practices by strengthening minority shareholder rights and external monitoring mechanisms.[4]

In addition to its impact on a country's overall information environment, foreigner access to local equity markets also influences the information environment at the firm level. Foreign investors in emerging markets are typically sophisticated institutional investors, such as mutual funds and pension funds. In general, institutional investors, whether foreign or domestic, have more resources and expertise than individual investors. Institutional investors enjoy economies of scale in information acquisition and processing due to relatively low per-unit costs of acquiring and analyzing information, and are better at gleaning insights from public information such as published annual reports. Such investors can thus be considered what Kim and Verrecchia (1994) call "elite information processors." Their superior information is ultimately incorporated into stock prices via trading. In a related vein, Kim and Verrecchia (1994, 1997) present a scenario under which the low-frequency public release of information, such as earnings announcements, triggers agents with diverse information processing skills to generate new idiosyncratic insights from the public disclosure.[5] Consistent with these arguments, several studies show that institutional investors are better informed, on average, and trade actively to exploit their information advantage (e.g., Chakravarty, 2001; Hartzell and Starks, 2003; Piotroski and Roulstone, 2004; Aslan et al., 2007; Ferreira and Laux, 2007). Thus, to the extent that institutions' buying and selling decisions are guided by the firm-specific information they gather and analyze, we expect that the trading activities of institutional investors, whether foreign or domestic, facilitate the price formation process by promoting the incorporation of firm-specific information into stock prices, which in turn reduces stock price synchronicity. To provide direct evidence on the issue, we test the following hypothesis in alternative form:

H1. Stock price synchronicity decreases with the intensity of trading by foreign and domestic institutional investors.

When it comes to the relative information advantage of foreign versus domestic institutional investors, the empirical evidence to date is mixed. Shukla and Inwegen (1995) and Hau (2001) find that domestic investors have an information advantage over foreign investors. In contrast, Grinblatt and Keloharju (2000) and Karolyi (2002) show that foreign investors outperform domestic institutional investors in Finland and Japan, respectively. Seasholes (2004) provides evidence suggesting that foreign investors in Taiwan are better informed than domestic institutions.

On one hand, foreign investors may have a disadvantage in gaining access to private information that corporate insiders have, relative to domestic institutional investors, for the following reasons. Foreign investors investing in Korean stocks may have an information disadvantage due to distance, language and culture. In Korea, corporate governance is relatively weak, corporate ownership is highly concentrated in the hands of a few controlling shareholders or founding family members, firms' affiliations with large business groups are prevalent, internal transactions among related parties are common and value-relevant (inside) information is often shared exclusively within the closely held network of related parties, including corporate insiders, affiliated or subsidiary firms within the same business group, substantial shareholders, main creditors, major customers and input suppliers (Jacobson and Aaker, 1993; Jiang and Kim, 2004; Joh, 2003; Kim and Yi, 2006). In this environment, domestic institutional investors are more likely to have informal channels through which they can communicate with insiders (e.g., CEO, board members and controlling shareholders), compared with foreign investors. As a result, foreign investors are likely to be informationally disadvantaged in local markets,

[4] For example, as part of post-crisis governance reforms, Korean listed companies are now required to have independent, non-executive directors on the board and to establish an audit committee under the board.

[5] Barron et al. (2002) find that public accounting disclosures trigger the production of significant idiosyncratic information.

compared with domestic institutions. Foreign investors may have to bear relatively high information costs to overcome this disadvantage. This information problem may discourage informed trading by foreign investors and potentially impede the incorporation of firm-specific information into stock prices (e.g., Grossman and Stiglitz, 1980; Roll, 1988; Morck et al., 2000), which in turn leads to less informative stock prices.

On the other hand, foreign investors may be better informed. Foreign investors in emerging markets are part of global investment companies who hold foreign stocks from multiple countries in their portfolios and rebalance their portfolios when new information arrives. Some of them are also located in world financial centers such as New York and London, which enables them quick access to better information and provides them with better learning opportunities through the transfer of information, skills and ideas. For example, Christoffersen and Sarkissian (2009) provide evidence that U.S. mutual funds located in financial centers perform better than other funds located elsewhere because managers of funds in financial centers can have better learning opportunities, which leads to performance improvements. These investors with global portfolios of equity shares are more likely to have a better understanding of, and the superior ability to collect and analyze, global business and investment factors (e.g., oil price trends and foreign currency fluctuations) that simultaneously influence the stock prices of multiple firms in many countries around the world. In particular, the Korean economy has a relatively high exposure to global business factors as its dependence on overseas demand for Korean products and overseas supply of non-labor inputs has been growing year after year.[6] As a result, the Korean economy is susceptible to external global shocks, such as oil price changes or currency movements. In fact, foreign investors may not only have better access to global information, they may also process global data and convert it into private information. To the extent that foreign investors have information about these business factors influencing the future prospects of Korean companies, we expect that foreign investors may have a relative information advantage over local institutions in Korea.

Given the two opposing perspectives on the relative information advantage of foreign investors vis-à-vis domestic institutional investors, it is an empirical question whether there are any differences in the informational roles that foreign and domestic institutional investors play in emerging markets. To provide direct evidence on this under-researched issue, we test the following hypothesis in alternative form.

H2. Trading by foreign investors decreases stock price synchronicity to a greater extent than trading by domestic institutions.

There are three different types of domestic institutional investors in Korea: (1) securities (or investment brokerage) and investment trust companies, including investment advisory companies; (2) insurance companies; and (3) banks, including short-term and long-term lending institutions. In general, institutions act as agents for other investors. They are thus constrained by various legal restrictions, such as the prudent-man laws, that purport to protect small individual investors. Among institutions, banks and insurance companies are subject to more stringent prudence standards, affecting their investment patterns and horizons (Del Guercio, 1996). In addition, when it comes to investing in equity shares, Korean banks and insurance companies are subject to the investment limits imposed under the Banking Act and Insurance Business Act, respectively, whereas no such regulations restrict securities and investment trust companies. Further, banks and insurance companies are more likely to have business relations with the local companies in which they invest, compared with securities and investment trust companies (Gillian and Starks, 2003; Aggarwal et al., 2011).[7] As a result, domestic banks and insurance companies hold shares of other companies primarily for the purposes of maintaining business relations and/or long-term investment purposes, and thus are less likely to trade shares for short-term profits,[8] while domestic securities and investment trust companies are more likely to engage actively in infor-

[6] According to the Bank of Korea, exports accounted for 55% of the nation's gross national income in 2008, which is well above Japan's 22% and the U.S.'s 18.5%.

[7] As an example, Samsung Life Insurance can manage the pension funds of many Korean listed companies and provide them with a company-wide group life insurance policy.

[8] In Korea, banks and insurance companies hold a large proportion of the voting rights of a firm to maintain their relationships or affiliations with the firm as a client or business partner. As such, their equity stakes can be viewed, in large part, as the holding of debt (Baek et al., 2004). Del Guercio (1996) provides evidence that institutional investors governed by prudent-man laws (e.g., pension funds and insurance companies) tend to hold stocks with certain characteristics for longer,

mation-based trading for short-term profits. One can therefore expect that, among the different types of domestic institutions, securities and investment trust companies play a more important role in facilitating the incorporation of firm-specific information into stock prices via their trading activities.

Given the scarcity of evidence on this issue, particularly in the context of an emerging market, we aim to provide systematic evidence on whether the informational roles of different domestic institutions differ according to their investment horizons. For this purpose, we hypothesize the following in alternative form:

H3. Trading by domestic institutions with short investment horizons decreases stock price synchronicity to a greater extent than trading by domestic institutions with long investment horizons.

3. Measurement of variables and model specification

3.1. Stock price synchronicity

A key dependent variable in our study is stock price synchronicity, which captures the extent to which individual stock returns co-move with common factors. The total variation of a firm's stock return can be decomposed into two components: (1) common return variation, that is, the return volatility associated with common (market-wide and industry-wide) factors, and (2) firm-specific return variation, that is the return volatility associated with firm-specific factors. Similar to other studies (e.g., Morck et al., 2000; Jin and Myers, 2006; Gul et al., 2010), we measure stock price synchronicity using the R^2 statistics from an augmented market model. Specifically, we estimate the following model using weekly return data for each stock:

$$r_{j,k,t} = \alpha_j + \beta_{j1} r_{m,t} + \beta_{j2}(r_{us,t} + e_{j,t}) + \beta_{j3,} r_{k,t} + \varepsilon_{jt} \tag{1}$$

where $r_{j,k,t}$ is the return on firm j in industry k at week t; $r_{m,t}$ is the Korea market index return at week t; $r_{us,t}$ is the U.S. market index return at week t; $e_{j,t}$ is the change in the exchange rate per U.S. dollar at week t; and $r_{k,t}$ is the value-weighted weekly return of industry k at week t, which is computed using all firms with the same two-digit code of the Korean Standard Industry Classification (KSIC), with firm j's weekly return excluded. Stocks are included in our sample if more than 40 weeks of data are available during a particular year. Eq. (1) includes U.S. stock market returns to control for the global market factor.[9]

Let σ_j^2 and $\sigma_{j\varepsilon}^2$ denote the total return variation and firm-specific return variation, respectively, of Eq. (1). Common return variation is then measured by $\sigma_j^2 - \sigma_{j\varepsilon}^2$. For each firm in the sample, we compute the *relative* common return variation for each stock using the ratio of common return variation to total return variation, that is, $(\sigma_j^2 - \sigma_{j\varepsilon}^2)/\sigma_j^2$. Note here that R_j^2 of Eq. (1) is equal to this ratio, while $1 - R_j^2$ of Eq. (1) is equal to $\sigma_{j\varepsilon}^2/\sigma_j^2$. We then obtain our measure of stock price synchronicity, denoted by *Synch*, for firm j in each year as

$$Synch_j = \log\left(\frac{\sigma_j - \sigma_{j\varepsilon}}{\sigma_{j\varepsilon}}\right) = \log\left(\frac{R_j^2}{1 - R_j^2}\right) \tag{2}$$

The logarithmic transformation is applied to circumvent the bounded nature of R_j^2 within $[0, 1]$. By construction, high values of *Synch* mean a higher level of common return variation relative to firm-specific return variation.

3.2. Empirical model

To examine the effect of trading by foreign versus domestic institutional investors on stock price synchronicity, we estimate the following regression model:

[9] In Eq. (1), the expression $r_{us,t} + e_{j,t}$ translates U.S. market returns into local currency units.

$$Synch_{jt} = \beta_0 + \beta_1 FORV_{jt} + \beta_2 DOMV_{jt} + \beta_3 \log(1 + \#ANAL)_{jt} + \beta_4 \log MVE_{jt} + \beta_5 LEV_{jt} + \beta_6 MB_{jt} + \beta_7 SROA_{jt} + \beta_8 HERFIN_{jt} + \beta_9 CHAEBOL_{jt} + \beta_{10} GDR_{jt} + \beta_{11} BIG4_{jt} + \beta_{12} AveVol_{jt} + (IndustryDummies) + (YearDummies) + error \quad (3)$$

where empirical definitions of all variables are provided in the Appendix and the dependent variable, *Synch*, for firm *j* and year *t*, is as defined in Eq. (2). Our proxy for the intensity of foreign trading, *FORV*, is the total number of shares purchased and sold by foreign investors as a fraction of the annual trading volume. Our proxy for the intensity of trading by domestic institutional investors, *DOMV*, is the total number of shares purchased and sold by different domestic investing institutions (i.e., securities and investment trust companies, banks, and insurance companies) as a fraction of the annual trading volume.

As control variables, we include firm-level variables that are deemed to influence *Synch*. Previous research shows that stock price synchronicity is positively related to the intensity of analyst activity in the U.S. market (Piotroski and Roulstone, 2004; Hameed et al., 2010), in emerging markets (Chan and Hameed, 2006) and around the world (Kim and Shi, 2010). We include the log-transformed measure of the number of analysts issuing earnings forecasts, that is, $\log(1 + \#ANAL)$, to control for this effect of analyst activity on *Synch*.[10] We include market capitalization ($\log MVE$), leverage (*LEV*) and the market-to-book ratio (*MB*) to control for the potential impacts of firm size, financial risk and growth potential, respectively, on *Synch*. Evidence shows that synchronicity is also inversely related to earnings volatility (e.g., Piotroski and Roulstone, 2004; Kim and Shi, 2010). We include earnings volatility, *SROA*, to control for the effect of this negative relation on our results, where *SROA* is measured by the standard deviation of return on assets (ROA) over the past five years using 10 half-year earnings observations. It is likely that firm performance is more interdependent among firms within a concentrated industry. In such a case, information that is specific to a firm is more likely to have valuation implications to other firms in the same industry. This can result in a higher level of intra-industry information transfer, which can lead to more synchronous stock prices (Piotroski and Roulstone, 2004). To control for this possibility, we include industry concentration (*HERFIN*), which is measured by the sales revenue-based Herfindahl index of industry-level concentration, where the industry is defined by its two-digit KSIC code.

Chaebols (large business groups or conglomerates) play a dominant role in the Korean economy. Prior to the Korean financial crisis in 1997, a top-30 chaebol controlled, on average, 26 firms in a variety of industries (Kim and Yi, 2006). Like other business groups in emerging markets, Korean chaebols can be viewed as a collection of diverse business enterprises in a wide range of industries, typically controlled by members of a founding family. Similar to *keiretsu* in Japan, the top-30 chaebols are highly diversified business groups with a nexus of explicit and implicit contracts that closely tie affiliated firms to one another, and often share value-relevant inside information exclusively with affiliated firms. Compared with independent firms, firms affiliated with large business groups in emerging markets may afford their controlling shareholders more opportunities for internal transactions through intra-group trading and internal financial markets for their private gains (Hubbard and Palia, 1999; Khanna and Palepu, 2000; Joh, 2003). This would provide chaebol-affiliated firms with more opportunities and means for managerial opportunism relative to independent firms. Consistent with the above argument, Kim and Yi (2006) find that chaebol-affiliated firms in Korea engage more aggressively in opportunistic earnings management compared with standalone firms. We include an indicator variable, *CHAEBOL*, to control for the potential effect of chaebol membership on the flow of firm-specific information to the market.

Fernandes and Ferreira (2008) document that cross-listing leads to a decrease in stock price synchronicity, particularly for firms in developed markets. We include an indicator variable representing the presence of cross-listing in overseas stock markets, denoted by *GDR*, to control for the effect of cross-listing on our results.

[10] To further examine whether foreign analysts' activities influence stock price synchronicity similar to foreign institutional trading activities, we define domestic analysts as ones forecasting earnings only for Korean firms in the Institutional Brokers' Estimate System (IBES) database. Using this definition, in lieu of $\log(1 + \#ANAL)$, we separate analyst coverage into foreign coverage ($\log(1 + \#ForeignANAL)$) and domestic coverage ($\log(1 + \#DomesticANAL)$) and estimate Eq. (4). We find that domestic coverage is positively related to stock price synchronicity, while foreign coverage is insignificantly related.

Extant evidence suggests that the quality of accounting disclosure is positively associated with audit quality in the U.S. (e.g., Reed et al., 2000), in East Asian countries (e.g., Mitton, 2002; Fan and Wong, 2005) and around the world (Choi and Wong, 2007; Choi et al., 2008). Large auditors, such as international Big 4 audit firms, are more likely to limit managerial discretion over opportunistic earnings management and thus help improve the credibility of published financial statements, which may, in turn, facilitate the flow of more credible, firm-specific information to the market. However, in Korea, their effect on synchronicity may be limited, because Big 4-affiliated auditors in Korea only have a member firm relationship with large local audit firms, and are not allowed to run their own operations in Korea. We include an indicator variable, *BIG4*, to control for audit quality differentiation between Big 4-affiliated and non-Big 4-affiliated auditors. We also include the average daily trading volume (*AveVol*) to control for the effect of liquidity. Industry dummies are included to control for industry fixed effects.

4. Sample and data

4.1. Foreign equity ownership in Korea

In 1992, foreigners were allowed for the first time to own equity shares of Korean firms. As summarized in Table 1, the ownership limit for foreign investors has increased since 1992, reflecting the Korean government's policy of gradually liberalizing Korean stock markets to the global investment community. The ownership limits for each individual foreign investor were 3% of a firm's shares outstanding in 1992, 4% in April 1996, 5% in October 1996, 6% in May 1997, 7% in November 1997, and 50% in December 1997—the starting month of the Korean financial crisis—and were completely lifted in May 1998. In addition to an individual ownership limit, the FSS imposed a limit for foreign investors as a group. In 1992, this aggregate ownership limit was 10%, meaning that foreigners as a group could own only up to 10% of the equity shares outstanding of a Korean firm listed on the KSE. The aggregate limit was increased to 12% in December 1994 and then gradually increased to 26% by November 1997. During the starting month of the Korean financial crisis, the aggregate limit increased to 55% and was completely lifted in May 1998.

Table 2 presents summary statistics of foreign equity ownership in Korea by year for the period 1992–2007. The second column of Table 2 provides the total number of shares (in millions of shares) owned by foreign investors. The numbers in parentheses represent the percentage of shares owned by foreign investors relative to total shares outstanding. This equally weighted measure of foreign ownership increased gradually from 4.1% in 1992 to 11.5% in 1996. It then decreased to 9.1% in 1997, reflecting an outflow of foreign equity investment during the Korean financial crisis. The post-crisis period, during which the foreign ownership limit was completely lifted, witnessed a stable increase in foreign ownership, from 10.5% in 1998 to a peak of 22.9% in 2005. The last column of Table 2 reports the market value (in billions of Korean won) of shares owned by

Table 1
Changes in shareholding limits for each foreign individual and foreigners as a group (as a percentage of the total number of shares outstanding). *Source*: FSS.

	Individual limit (%)	Aggregate limit (%)
January 1992	3	10
December 1994	3	12
July 1995	3	15
April 1996	4	18
October 1996	5	20
May 1997	6	23
November 1997	7	26
December 1997	50	55
May 1998	No ceiling	No ceiling

The individual limit represents the percentage of equity shares each individual foreigner is allowed to hold. The aggregate limit represents the percentage of equity shares that foreigners as a group are allowed to hold.

Table 2
Number and market value of shares held by foreign investors in each sample year. *Source*: FSS.

Year	Number of shares held by foreign investors (millions of shares), as a percentage relative to the total number of shares	Market value of shares held by foreigners (billions of Korean won), as a percentage relative to total market capitalization
1992	220.2	n/a
	(4.1%)	
1993	503.0	n/a
	(8.7%)	
1994	634.8	15,402
	(9.2%)	(10.2%)
1995	762.3	16,723
	(10%)	(11.9%)
1996	989.2	15,222
	(11.5%)	(13%)
1997	819.8	10,358
	(9.1%)	(14.6%)
1998	1204.1	25,633
	(10.5%)	(18.6%)
1999	2136.8	76,590
	(12.3%)	(21.9%)
2000	2731.1	56,558
	(13.9%)	(30.1%)
2001	2869.2	93,698
	(14.7%)	(36.6%)
2002	3054.5	93,160
	(11.5%)	(36.0%)
2003	4259.1	142,534
	(18%)	(40.1%)
2004	5514.1	173,158
	(22%)	(41.9%)
2005	5334.9	260,262
	(22.9%)	(39.7%)
2006	5563.1	262,533
	(22.2%)	(37.2%)
2007	5347.9	308,180
	(18.9%)	(32.3%)

foreign investors. The numbers in parentheses represent this market value's percentage of the total market capitalization of all firms listed on the KSE. This value-weighted measure of foreign ownership is greater than the equally weighted measure across all years and the difference between the two measures has increased over years since the 1997 crisis. This difference indicates that foreign investors hold disproportionately more shares of large firms in their portfolios, a characteristic that became increasingly pronounced during the post-crisis period of 1998–2007.

4.2. Sample construction

Our sample construction begins with the list of non-financial firms included in the 2007 *KIS-DATA* file compiled by the Korea Investment Service, a subsidiary of Moody's Investment Service.[11] The KIS-DATA file includes financial statement data and ownership-related data, including the number of shares held by foreign investors, domestic institutions by type (i.e., securities and investment trust companies, banks, and insurance companies) and the largest shareholder for all firms listed on the KSE. All stock return data are gathered from Data stream and trading volume data are obtained directly from the KSE. The number of analysts following a firm is obtained from the IBES International Summary. We exclude firms in regulated

[11] Kang and Stulz (1997) exclude firms in the financial service industry from their Japanese sample.

Table 3
Distribution of sample firms by year.

Year	Number of firms	Percentage
1998	434	9.63
1999	437	9.69
2000	399	8.85
2001	427	9.47
2002	405	8.98
2003	512	11.36
2004	443	9.83
2005	442	9.80
2006	489	10.85
2007	520	11.54
Total	4508	100

industries (e.g., utilities and telecommunications) and firms with negative sales or negative total assets in a particular year.[12]

Our final sample consists of 4508 firm–year observations for the 10-year post-crisis period of 1998–2007, during which the foreign ownership limit was completely lifted. Restricting our sample to the post-crisis observations allows us to effectively control for the potential effect of the foreign ownership constraint on our results. We winsorize all continuous variables at the 1st and 99th percentiles to mitigate the effects of extreme observations. Table 3 provides the number of firms included in our sample and their percentage relative to total firm–year observations by year.

5. Empirical results

5.1. Descriptive statistics

Table 4 presents the distributional properties of our research variables. The R^2 statistics refer to the coefficient of determination for Eq. (1), while *Synch* is our log-transformed measure of stock price synchronicity in Eq. (2). As shown in Panel A of Table 4, the mean and median R^2 are 0.266 and 0.245, respectively. The mean R^2 of 0.266 is greater than the reported mean R^2 of 0.193 for the U.S. sample of Piotroski and Roulstone (2004), though it is lower than the reported mean R^2 of 0.454 for the Chinese sample of Gul et al. (2010), suggesting that the stock prices of Korean firms are more (less) synchronous than those of U.S. (Chinese) firms. Panel B of Table 4 provides descriptive statistics for the *PIN* measures that are inversely related to *Synch*. The *PIN* measure appears to be reasonably distributed, with a mean (median) of 0.215 (0.213) and a standard deviation of 1.175.

Panel C of Table 4 presents the distributional properties of $FORV$, $DOMV$ and two components of $DOMV$, that is, $STDV$ and $LTDV$, where $DOMV = STDV + LTDV$. These four trading intensity measures represent the total number of shares traded (i.e., purchased and sold) per year by foreign investors, domestic institutions, domestic short-term institutions (i.e., securities and investment trust companies) and domestic long-term institutions (i.e., bank and insurance companies), respectively, as a fraction of the annual trading volume.[13] As shown in Panel C of Table 4, the distributions of these trading measures appear to be skewed, and foreign investors and domestic institutions, on average, traded about 10% and nearly 19%, respectively, of total shares outstanding. Consistent with our expectations, both the mean and median values of $STDV$ are greater than those of $LTDV$, suggesting that domestic short-term institutions trade more intensely than domestic long-term institutions.

[12] Several firms in regulated industries (e.g., utilities and telecommunications) are subject to other types of regulatory limits of foreign ownership, even after 1998. These companies are excluded from our sample.

[13] We also run our analyses using the log-transformed measures of $FORV$, $DOMV$, $STDV$ and $LTDV$. The results (unreported) are qualitatively similar.

Table 4
Descriptive statistics.

	Q1	Mean	Median	Q3	Std. dev.	*N*
Panel A: Stock price synchronicity						
R^2	0.129	0.266	0.245	0.386	0.170	4508
Synch	−1.904	−1.297	−1.124	−0.463	1.175	4508
Panel B: Probability of informed trading measure						
PIN	0.185	0.215	0.213	0.246	0.054	2933
Panel C: Variables of interest used in main regressions						
FORV	0.003	0.103	0.020	0.101	0.191	4508
DOMV	0.015	0.188	0.092	0.308	0.220	4508
STDV	0.007	0.126	0.050	0.201	0.163	4508
LTDV	0.006	0.061	0.031	0.097	0.073	4508
Panel D: Control variables						
$\log(1+\#ANAL)$	0.000	0.656	0.000	1.100	0.779	4508
$\log MVE$	16.940	18.089	17.786	18.956	1.643	4508
LEV	0.348	0.492	0.493	0.634	0.195	4508
MB	0.346	0.898	0.594	1.060	0.949	4508
SROA	0.022	0.048	0.035	0.055	0.048	4508
HERFIN	0.017	0.064	0.023	0.096	0.069	4508
CHAEBOL	0.000	0.221	0.000	0.000	0.415	4508
GDR	0.000	0.036	0.000	0.000	0.187	4508
BIG4	0.000	0.479	0.000	1.000	0.499	4508
AveVol	0.004	0.012	0.009	0.020	0.063	4508

All variables are defined in Appendix B.

Panel D of Table 4 reports descriptive statistics for the control variables included in Eq. (3), together with other control variables used in simultaneous estimations. In general, our sample firms display considerable cross-sectional variation in $\log(1+\#ANAL)$, *LEV*, *MB*, *SROA* and *HERFIN* as reflected in the large standard deviations relative to their mean values. Descriptive statistics for our size variable ($\log MVE$) suggest that it is reasonably distributed, though its cross-sectional variation is not large relative to other variables. On average, about 22% of our sample firms are affiliated with chaebols, while 3.6% of our sample firms are cross-listed on overseas stock markets via Global Depository Receipts (GDRs). On average, only about 48% of our sample firms have their financial statements audited by Big 4-affiliated audit firms. Given that about 85% of U.S. firms are audited by Big 4 auditors (e.g., Kim et al., 2003), the evidence in Table 4 indicates that Big 4-affiliated auditors in Korea have a much smaller market share in the Korean audit market than in the U.S. market.

5.2. Results of main regressions

Table 5 presents the results of our main regression in Eq. (3). Throughout the paper, all reported *t*-values for the estimated coefficients are on an adjusted basis using standard errors corrected for firm and year clustering.[14] As shown in column 1 of Table 5, we find that the coefficient of the intensity of foreign trading, *FORV*, is significantly negative at the 1% level, suggesting that stock price synchronicity decreases significantly with the intensity of foreign trading. As shown in column 2 of Table 5, when we add the intensity of domestic institutional trading to that of foreign trading, we find that both the coefficients of *FORV* and *DOMV* are significantly negative at the 1% and 10% levels, respectively (−0.513 with $t=-2.94$ and −0.225 with $t=-1.94$, respectively). This is consistent with H1, suggesting that institutional trading, whether foreign or domestic, accelerates the incorporation of firm-specific information into stock prices, thereby reducing stock price synchronicity.

[14] See Petersen (2009) for a detailed discussion about the use of clustered standard errors as a means to correct residual correlations in panel data.

Table 5
Effect of foreign and domestic institutional trading on stock price synchronicity.

Variable	Dependent variable = *Synch*					
	(1)		(2)		(3)	
	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.	Coeff.	*t*-Stat.
FORV	−0.559	−3.14[a]	−0.513	−2.94[a]	−0.558	−2.95[a]
DOMV			−0.225	−1.94[c]		
STDV					−0.836	−2.17[b]
LTDV					−0.159	−0.26
log(1 + #*ANAL*)	0.135	2.40[b]	0.142	2.48[b]	0.144	2.48[b]
log *MVE*	0.170	3.87[a]	0.184	4.25[a]	0.181	4.23[a]
LEV	0.014	0.12	−0.010	−0.35	−0.009	−0.35
MB	0.000	0.06	0.000	0.02	0.000	0.01
SROA	−0.916	−2.80[a]	−0.931	−2.85[a]	−0.927	−2.82[a]
HERFIN	−0.006	−0.10	−0.024	−0.17	−0.016	−0.16
CHAEBOL	0.263	4.77[a]	0.265	4.81[a]	0.261	4.78[a]
GDR	0.158	1.67[c]	0.138	1.56	0.153	1.62
BIG4	0.079	2.38[b]	0.079	2.40[b]	0.080	2.39[b]
AveVol	−0.753	−1.15	−1.098	−1.32	−1.073	−1.29
Intercept	−4.667	−5.94[a]	−4.868	−6.26[a]	−4.833	−6.22[a]
Industry dummy	Yes		Yes		Yes	
Adjusted R^2	0.248		0.249		0.249	
N	4508		4508		4508	

The superscripts a, b and c denote the 1%, 5% and 10% levels of significance, respectively, using a two-tailed test. All variables are defined in Appendix B. Reported *t*-values are on an adjusted basis using standard errors corrected for clustering by firm and by year.

In column 3 of Table 5, we decompose domestic institutional trading, namely, *DOMV*, into (i) trading by short-term institutions such as securities and investment trust companies that have a relatively short investment horizon, *STDV*, and (ii) trading by long-term institutions such as banks and insurance companies that have a relatively long investment horizon, *LTDV*. We then include these two proxies in lieu of *DOMV* in our regression. This decomposition allows us to evaluate whether investment horizons differentially influence the informational role of domestic institutions. We find that the coefficient of *STDV* is significant at the 5% level with an expected negative sign, while the coefficient of *LTDV* is negative but insignificant at any conventional level. The above results are consistent with H2, suggesting that domestic short-term institutions play a more important role in facilitating the incorporation of firm-specific information into prices via their trading activities, compared with domestic long-term institutions. The above finding is consistent with that of Yan and Zhang (2009), who find that in the U.S. market, short-term institutions are better informed than long-term institutions.

Turning back to the results in column 2 of Table 5, we find that, while the coefficients for both *FORV* and *DOMV* are significantly negative, the coefficient of *FORV* is significantly greater in its absolute magnitude than the coefficient of *DOMV* ($p = 0.05$, one-tailed test). This finding is consistent with H3, suggesting that the *Synch*-reducing effect of foreign trading observed is not driven by the fact that foreign investors are institutional investors. Rather, the results are consistent with the view that foreign investors are better informed and more actively involved in informed trading than domestic institutions. Stated another way, foreign investors have superior ability to collect and process firm-specific information than domestic institutions, and tend to trade more intensely on it. As a result, trading by foreign investors accelerates firm-specific information capitalization into stock prices in a more accurate and timely manner, compared with trading by domestic institutions.

As shown in column 3 of Table 5, however, when we decompose domestic investing institutions into securities and investment trust companies (with a relatively short investment horizon) and non-securities companies such as banks and insurance companies (with a relatively long investment horizon), we find that the coefficients of both *FORV* and *STDV* are significant with an expected negative sign at the 1% and 5% levels, respectively, while the coefficient of *LTDV* is insignificant at any conventional level. This result suggests that

the synchronicity-reducing effect of domestic institutional trading observed in column 2 of Table 5 is driven, in large part, by trading by domestic short-term institutions, and not by domestic long-term institutions. We also find that the coefficient of $STDV$ is not significantly different in magnitude from that of $FORV$ ($p = 0.18$, one-tailed test), suggesting that both foreign investors and domestic short-term institutions facilitate firm-specific information flow to the market to a similar degree. In short, the results reported in Table 5, taken together, indicate that both foreign investors and domestic short-term institutions contribute more to the incorporation of firm-specific information into stock prices via their trading activities than domestic long-term institutions.

With respect to the estimated coefficients of control variables, the following is apparent. First, the coefficient of $\log(1 + \#ANAL)$ is significantly positive at the 5% level across all columns of Table 5, indicating that synchronicity increases with analyst following. This is in line with the finding of previous research, that stock prices become more synchronous as analyst activities become more intense in the U.S. market (Piotroski and Roulstone, 2004; Hameed et al., 2010), in emerging markets (Chan and Hameed, 2006) and around the world (Fernandes and Ferreira, 2008; Kim and Shi, 2010), because analysts engage primarily in the production and dissemination of common (industry-wide and/or market-wide) information, as opposed to firm-specific information. Second, we find that the coefficient of $\log MVE$ is significantly positive across all columns, reflecting that large firms have more synchronous prices. Third, we find that synchronicity decreases significantly with earnings volatility ($SROA$). Fourth, we find a significantly positive coefficient for $CHAEBOL$, suggesting that stock prices are more synchronous for chaebol-affiliated firms. Finally, contrary to our expectations, we find that synchronicity is higher for firms who appoint Big 4-affiliated auditors than for those with non-Big 4-affiliated auditors.

5.3. Does the level of institutional holdings matter?

Previous research uses the level of institutional holdings as a proxy for institutions' information advantage when examining the informational role of institutions (e.g., Jiambalvo et al., 2002; Yan and Zhang, 2009). On one hand, higher shareholdings may enable institutional investors to gain access to firm-specific private information. This suggests that the level of institutional holdings is inversely related to synchronicity. On the other hand, institutions that follow index investment strategies or section-based strategies are more likely to have an information advantage with respect to industry- or market-level information, which contributes to improving intra-industry information transfers. This view suggests a positive relation between institutional holdings and synchronicity. To see whether our results reported in Table 5 are driven by the omission of the institutional holding variables, we re-estimate our main regression in Eq. (3) after adding the *levels* of foreign and domestic institutional holdings at the end of year $t - 1$ to the trading intensity measures.[15]

Though not reported here for brevity, our re-estimated results show that the inclusion of the level-of-holding (as opposed to trading) variables does not alter our main inferences on the test variables, $FORV$, $DOMV$, $STDV$ and $LTDV$. That is, (i) trading by both foreign and domestic institutions facilitates the incorporation of firm-specific information into stock prices, thereby reducing stock price synchronicity or co-movement; (2) trading by foreign investors decreases synchronicity to a greater extent than trading by domestic institutions; and (3) trading by domestic short-term institutions decreases synchronicity, but trading by domestic long-term institutions does not. We also find that the levels of shareholdings of foreign and domestic institutional investors are insignificant in influencing synchronicity. In short, the above findings, taken together, suggest that it is institutional trading and not institutional holding, which facilitates the incorporation of firm-specific information into stock prices.

5.4. Change analysis

Although the above analysis controls for many firm characteristics that might account for the relationship between synchronicity and institutional trading, there is an endogeneity concern with respect to omitted

[15] Since in 2004 the FSS stopped requiring the reporting of ownership stakes by different types of investors in Business Reports, equivalent to U.S. 10-K reports, our analysis is limited to the period 1998–2003.

Table 6
Change analysis.

Variable	Dependent variable = *Synch*	
	Coeff.	*t*-Stat.
$\Delta FORV$	−0.443	−1.88[c]
$\Delta STDV$	−0.616	−2.45[b]
$\Delta LTDV$	0.221	0.47
$\Delta\log(1+\#ANAL)$	0.060	1.36
$\Delta\log MVE$	−0.116	−2.86[a]
ΔLEV	−0.325	−1.23
ΔMB	−0.000	−3.40[a]
$\Delta SROA$	−0.681	−1.29
$\Delta HERFIN$	−2.369	−2.35[b]
$\Delta CHAEBOL$	0.037	0.29
ΔGDR	0.229	0.47
$\Delta BIG4$	0.119	2.22[b]
$\Delta AveVol$	−4.966	−4.23[a]
Intercept	0.002	0.08
Industry dummy	Yes	
Adjusted R^2	0.058	
N	3723	

The superscripts a, b and c denote the 1%, 5% and 10% levels of significance, respectively, using a two-tailed test. All variables are defined in Appendix B. Reported *t*-values are on an adjusted basis using standard errors corrected for clustering by firm and by year.

correlated variables. To alleviate concerns over omitted correlated variables, we perform a change-based analysis using the model

$$\begin{aligned}\Delta Synch_{jt} = {} & \beta_0 + \beta_1 \Delta FORV_{jt} + \beta_2 \Delta STDV_{jt} + \beta_3 \Delta LTDV_{jt} + \beta_4 \Delta \log(1+\#ANAL)_{jt} + \beta_5 \Delta \log MVE_{jt} \\ & + \beta_6 \Delta LEV_{jt} + \beta_7 \Delta MB_{jt} + \beta_8 \Delta SROA_{jt} + \beta_9 \Delta HERFIN_{jt} + \beta_{10} \Delta CHAEBOL_{jt} + \beta_{11} \Delta GDR_{jt} \\ & + \beta_{12} \Delta BIG4_{jt} + \beta_{13} \Delta AveVol_{jt} + (IndustryDummies) + error \end{aligned} \quad (4)$$

where all variables starting with Δ represent changes in the variables from year $t-1$ to year t and the variables are as defined earlier.

Table 6 presents the results for the above change-based regression, using a reduced sample of 3723 observations. We find that the coefficients of $\Delta FORV$ and $\Delta STDV$ are both significantly negative, while the coefficient of $\Delta LTDV$ is insignificantly positive, which is consistent with the findings of the level-based tests (as reported in Table 5). Overall, the results of our change-based regressions suggest that an increase in the trading activities of foreign and short-term domestic investors leads to a decrease in stock price synchronicity, while the trading activities of domestic long-term institutions are not associated with synchronicity. This finding provides additional assurance that our level-based regression results reported in Table 5 are unlikely to be driven by correlated omitted variables or reverse causality.

6. Results using an alternative measure of firm-specific information flows

Since Roll (1988), a growing body of research in the finance literature[16] has provided evidence that higher synchronicity means a smaller amount of firm-specific information capitalized into stock prices. Put differently, the lower the level of stock price synchronicity, the greater the relative amount of firm-specific information being incorporated into stock prices. For the purpose of our study, an inverse relation between the

[16] See, for example, Morck et al. (2000), Jin and Myers (2006), Chen et al. (2007), Ferreira and Laux (2007), Fernandes and Ferreira (2008), Hutton et al. (2009) and Gul et al. (2010).

intensity of (foreign and domestic) institutional trading and our synchronicity measure can be viewed as an indication that institutional trading facilitates the flow of firm-specific information to the market and its incorporation into stock prices, thereby reducing synchronicity. Admittedly, however, this information-based interpretation of synchronicity is not without controversy.[17] Noise trading and limits to arbitrage may be responsible for an increase in return volatility. For example, one can argue that institutional trading adds noise in stock returns and thus increases idiosyncratic volatility in stock returns, or decreases synchronicity, which in turn leads to an inverse relation between institutional trading and synchronicity. To further substantiate the hypothesized (inverse) relation between institutional trading and stock price synchronicity, we also consider an alternative measure of synchronicity that focuses on the flow of firm-specific *private* information flows to the market. For this purpose, we first obtain the *annual* measure of the probability of informed trading (*PIN*). Appendix A describes how the *PIN* measure is calculated. We then re-estimate our main regression in Eq. (3) with *PIN* as the dependent variable in lieu of *Synch*.[18]

As mentioned earlier, institutional investors are elite information processors capable of transforming public information into value-relevant private information. These institutional investors may also have an advantage over individual investors in gaining access to and gathering and processing firm-specific private information. Therefore, institutional investors are more likely to make their trading decisions based on firm-specific private information than individual investors. As institutional trading becomes more intense, a firm's shares are more likely to be traded by informed traders, which in turn leads to a higher probability of informed trading. We therefore predict a *positive* relation between the intensity of institutional trading and our proxy for the flow of firm-specific private information to the market, namely, *PIN*. As explained in Appendix A, the *PIN* measure is developed from a structural market microstructure model and captures the relative amount of firm-specific private information incorporated into stock prices via information-based trading.[19]

In estimating our main regressions using *PIN* as the dependent variable in lieu of *Synch*, we keep the same set of control variables as before, because our objective here is not to investigate cross-sectional determinants of private information-based trading activities but, rather, to see whether our main results are robust to the alternative measure of firm-specific information flow. We re-estimate our main regressions in Table 5 with *PIN* as the dependent variable and present the new results in Table 7. As shown in Table 7, the coefficients of *FORV* and *STDV* are 0.037 with $t = 2.73$ and 0.075 with $t = 4.39$, respectively. This suggests that trading by foreign investors and domestic short-term institutions increases the relative amount of firm-specific private information capitalized into stock prices as reflected in our *PIN* measure. We find, however, that *PIN* is not significantly associated with trading by domestic long-term institutions (*LTDV*). We also find that trading by domestic short-term institutions has a larger impact on *PIN* than trading by foreign investors ($p < 0.01$, one-tailed test). To the extent that a higher *PIN* is associated with lower *Synch* or higher firm-specific return variation, the significant positive relations of *PIN* with *FORV* and *STDV*, and the insignificant relation between *Synch* and *LTDV* are in line with our earlier results reported in Table 5. The above results corroborate the view that our *Synch* measure correctly captures the amount of firm-specific information capitalized into stock prices via information-based trading.

Overall, the results reported in Table 7 corroborate our earlier finding that trading by foreign investors and domestic short-term institutions facilitates the capitalization of firm-specific information into stock prices via information-based trading, while trading by domestic long-term institutions does not.

7. Institutional trading and the mispricing of accruals

Thus far, our evidence consistently indicates that foreign investors and domestic short-term institutions facilitate the incorporation of firm-specific information into stock prices via their trading activities, while

[17] A few (unpublished) studies raise questions about this information-based interpretation of synchronicity and provide evidence suggesting that synchronicity may reflect noises in stock returns that are not related to firm-specific information (Ashbaugh-Skaife et al., 2006; Teoh et al., 2008). As in many other studies, our tests are predicated upon the information-based interpretation of synchronicity, given that evidence supporting this interpretation is overwhelming and growing in the contemporary finance (and accounting) literature.

[18] Analysis using the *PIN* measure has fewer observations (2933 firm–year observations) due to data limitations.

[19] We thank Woo-Jong Lee for his assistance in obtaining the data required for computing *PIN*.

Table 7
Results of simultaneous estimations of the relations between foreign and domestic institutional trading and *PIN*, a measure of the probability of informed trading.

Variable	Dependent variable = *PIN*	
	Coeff.	*t*-Stat.
FORV	0.037	2.73[a]
STDV	0.075	4.39[a]
LTDV	0.039	1.63
log(1 + #*ANAL*)	−0.008	−4.36[a]
log *MVE*	−0.013	−11.75[a]
LEV	−0.025	−4.15[a]
MB	0.000	9.83[a]
SROA	−0.048	−3.59[a]
HERFIN	0.013	1.14
CHAEBOL	−0.001	−0.01
GDR	0.006	0.88
*BIG*4	0.001	0.89
AveVol	−0.087	−2.83[a]
Intercept	0.475	22.14[a]
Industry dummy	Yes	
Adjusted R^2	0.192	
N	2933	

The superscripts a, b and c denote the 1%, 5% and 10% levels of significance, respectively, using a two-tailed test. All variables are defined in Appendix B. Reported *t*-values are on an adjusted basis using standard errors corrected for clustering by firm and by year.

domestic long-term institutions do not. As an additional validity check, our analysis below focuses on whether and how trading activities by three different types of institutional investors—foreign, domestic short-term and domestic long-term institutions—differentially affect the pricing efficiency of accounting accruals. Our analysis is motivated by Sloan (1996), who finds a negative relation between the accrual component of current earnings and future stock returns. His finding, which is often referred to as an "accrual anomaly," suggests that the market price does not fully reflect the accrual component of earnings being less persistent than the cash flow component of earnings. His analysis further demonstrates that a hedge trading strategy of buying stocks with low accruals and selling stocks with high accruals yields significant abnormal returns in the year following portfolio formation.

Drawing on Sloan's (1996) findings, one can argue that sophisticated institutional investors with superior ability to analyze and interpret published annual financial reports should be better able to understand the differential persistence of the two earnings components, accruals and cash flows, and that their trading activities facilitate the impounding of these two earnings components into stock prices. Given our finding that foreign and domestic short-term institutional investors contribute more to the incorporation of firm-specific information into stock prices via their trading activities than domestic long-term institutions, we predict that a trading strategy that exploits the mispricing of the accrual component of earnings should be less profitable for firms whose shares are more intensely traded by foreign and domestic short-term institutional investors.

To test the above prediction, we first compute the accrual component of annual earnings as follows:

$$Accruals_{j,t} = Earnings_{j,t} - CFO_{j,t} \tag{5}$$

where, for firm j and year t, *Earnings* is earnings from continuing operations standardized by average total assets and *CFO* is cash flow from operations divided by average total assets. Similar to Sloan (1996), we then compute one-year-ahead size-adjusted returns as a proxy for future abnormal returns. One-year-ahead size-adjusted returns are the difference between a firm's annual buy-and-hold return and the average annual buy-and-hold return of the size decile portfolio to which the firm belongs. To calculate the return to the size decile portfolios, all firms are assigned to size deciles based on their market value of equity at the beginning of the year in which the return accumulation period begins. The decile portfolio return is the value-weighted return of all

firms that belong to the size decile portfolio. Annual size-adjusted (buy-and-hold) returns for each size decile portfolio are computed for the 12-month period starting four months after the end of the fiscal year.

To evaluate the profitability of our accrual-based trading strategy, we assign firms into deciles at the beginning of each fiscal year based on the magnitude of accruals and then group them into three portfolios: the lowest (deciles 1 and 2), the middle (deciles 3 through 8) and the highest (deciles 9 and 10). We then calculate future abnormal returns for each portfolio for the year after portfolio construction. Panel A of Table 8 reports the results for the full sample, while Panels B, C and D report the results for the subsamples partitioned by the intensity of institutional trading by foreign, domestic short-term and domestic long-term institutional investors, respectively.

As presented in Panel A of Table 8, we find that, consistent with Sloan (1996), one-year-ahead abnormal returns (i.e., size-adjusted returns) to accrual-based decile portfolios decrease monotonically as we move from low-accrual portfolios (deciles 1 and 2) to high-accrual portfolios (deciles 9 and 10). When we form a hedge portfolio with a long position in the low-accrual portfolio (deciles 1 and 2) and a short position in the high-accrual portfolio (deciles 9 and 10), the return to this hedge portfolio is 15.9%, which is significant both statistically ($t = 4.76$) and economically.

In Panel B of Table 8, we assess the impact of foreign investors' trading activities on the pricing of accruals. For this purpose, we first partition our full sample into two subsamples: one with high *FORV* (above-median *FORV*) and the other with low *FORV* (below-median *FORV*). As shown in Panel B of Table 8, we find that one-year-ahead abnormal returns are also negatively related to accruals for both subsamples. More importantly, we find that the return to the hedge portfolio is smaller for the high-*FORV* subsample (0.092) than for the low-*FORV* subsample (0.225), and this return difference between the two subsamples is significant at the 10% level ($t = 1.82$), as indicated in the last column of the same panel. The above results are in line with the view that foreign investors understand the implication of accruals for future returns and their trading activities reduce the mispricing of accruals.

In Panel C of Table 8, we partition our full sample into two subsamples using the trading intensity of short-term domestic institutions: one with high *STDV* and the other with low *STDV*. As seen in Panel C of Table 8, we find that one-year-ahead abnormal returns decrease with the magnitude of accruals for both subsamples. Moreover, we find that the return to the hedge portfolio is smaller for the high-*STDV* subsample (0.073) than for the low-*STDV* subsample (0.253). This return difference is significant at the 1% level ($t = -2.77$). The above results are consistent with the view that domestic short-term institutions facilitate the incorporation of firm-specific information into stock prices via their trading activities, leading us to observe the one-year-ahead return to the hedge portfolio is lower for the high-*STDV* subsample than for the low-*STDV* subsample.

Panel D of Table 8 reports the results for the two subsamples of firms with high *LTDV* and low *LTDV*. Similar to the results reported in both Panels B and C of Table 8, the results in Panel D show that one-year-ahead abnormal returns decrease with the magnitude of accruals for both high-*LTDV* and low-*LTDV* subsamples. We find, however, that the return to the hedge portfolio does not differ significantly between the high-*LTDV* subsample (0.127) and the low-*LTDV* subsample (0.190). This finding is in line with our earlier findings that, unlike foreign and short-term domestic institutions, the trading activities of domestic long-term institutions do not necessarily facilitate the incorporation of firm-specific information into stock prices via their trading activities.

We next conduct a regression analysis to further examine the relation between the accrual component of earnings and future stock returns after controlling for other variables that are deemed to affect future stock returns. Specifically, we estimate the regression model

$$\begin{aligned} SAR_{j,t+1} = {} & a_0 + a_1 ACC^{dec}_{j,t} + a_2 Size_{j,t} + a_3 \log BM_{j,t} + a_4 EP_{j,t} + a_5 FORV\_H_{j,t} + a_6 STDV\_H_{j,t} \\ & + a_7 LTDV\_H_{j,t} + a_8 ACC^{dec}_{j,t} * FORV\_H_{j,t} + a_8 ACC^{dec}_{j,t} * STDV\_H_{j,t} + a_8 ACC^{dec}_{j,t} * LTDV\_H_{j,t} \\ & + (industrydummies) + error \end{aligned} \tag{6}$$

where, for firm j and year t (or $t+1$), $SAR_{j,t+1}$ is the one-year-ahead size-adjusted return; $ACC^{dec}_{j,t}$ is the decile rank of an accrual-based decile portfolio, scaled to range from zero to one; $Size_{j,t}$ is the natural log of the year-end market capitalization; $\log BM_{j,t}$ is the natural log of the ratio of the book value of common equity to the

Table 8
Institutional trading and the mispricing of accruals.

Accrual-based decile portfolio	Mean	*t*-Statistics
Panel A: Hedge portfolio test for the full sample		
Deciles 1 and 2	0.046	1.68[c]
Deciles 3–8	−0.009	−0.68
Deciles 9 and 10	−0.113	−5.87[a]
Return to the hedge portfolio	0.159	4.76[a]

Accrual-based decile portfolio	High *FORV*		Low *FORV*		Difference
	Mean	*t*-Stat.	Mean	*t*-Stat.	*t*-Stat.
Panel B: Hedge portfolio test for high FORV versus low FORV					
Deciles 1 and 2	0.025	0.69	0.063	0.025	0.69
Deciles 3–8	0.015	0.83	−0.036	0.015	0.83
Decile 9 and 10	−0.067	−2.59[a]	−0.162	−0.067	−2.59[a]
Return to the hedge portfolio	0.092	1.82[c]	0.225	0.092	1.82[c]
Accrual-based decile portfolio	High *STDV*		Low *STDV*		Difference
	Mean	*t*-Stat.	Mean	*t*-Stat.	*t*-Stat.
Panel C: Hedge portfolio test for high STDV versus low STDV					
Deciles 1 and 2	0.044	1.17	0.047	1.21	0.26
Deciles 3–8	0.004	0.23	−0.024	−1.08	0.34
Deciles 9 and 10	−0.029	−1.08	−0.206	−7.93[a]	4.69[a]
Return to the hedge portfolio	0.073	1.70[c]	0.253	5.40[a]	−2.77[a]
Accrual-based decile portfolio	High *LTDV*		Low *LTDV*		Difference
	Mean	*t*-Stat.	Mean	*t*-Stat.	*t*-Stat.
Panel D: Hedge portfolio test for high LTDV versus low LTDV					
Deciles 1 and 2	0.038	0.96	0.051	1.37	1.03
Deciles 3–8	0.010	0.56	−0.031	−1.40	0.83
Deciles 9 and 10	−0.089	−3.41[a]	−0.139	−4.91[***]	1.65[c]
Return to the hedge portfolio	0.127	3.15[a]	0.190	3.63[***]	0.28

	(1)		(2)	
	Coefficient	*t*-Value	Coefficient	*t*-Value
Panel E: Cross-sectional regressions of stock returns on accruals and other predictors of returns				
ACC^{dec}	−0.141	−3.75[a]	−0.398	−3.50[a]
SIZE	0.034	4.50[a]	0.032	3.13[b]
log *BM*	0.270	5.88[a]	0.253	5.91[a]
EP	0.013	0.51	0.023	0.81
FORV_H			−0.136	−1.09
STDV_H			−0.082	−1.30
LTDV_H			0.014	0.22
ACC^{dec} * *FORV_H*			0.207	2.01[c]
ACC^{dec} * *STDV_H*			0.230	2.68[b]
ACC^{dec} * *LTDV_H*			−0.062	−0.56
Intercept	−0.871	−5.95[a]	−0.727	−3.54[a]
Industry dummy	Yes		Yes	
Adjusted R^2	0.071		0.104	

The superscripts a, b and c denote the 1%, 5% and 10% levels of significance, respectively, using a two-tailed test. All variables are defined in Appendix B. Each reported coefficient represents the average of estimated coefficients from ten annual regressions. Each reported *t*-value is computed using the empirical distribution of ten annual coefficients (after correcting for serial correlation).

market value of common equity; $EP_{j,t}$ is the ratio of earnings per share divided by the fiscal year-end stock price; $FORV\_H_{j,t}$ is an indicator variable that equals one if *FORV* is higher than its median, and zero otherwise; and $STDV\_H_{j,t}$ ($LTDV\_H_{j,t}$) is an indicator variable that equals one if *STDV* (*LTDV*) is higher than its median, and zero otherwise.

Panel E of Table 8 reports the results of the Fama–MacBeth (1973) regression in Eq. (6).[20] Column 1 reports the result of a baseline regression without including institutional trading variables and their interactions with ACC^{dec}. The coefficient of ACC^{dec} is significantly negative, which is consistent with the results reported in Panel A of Table 8.[21] Column 2 of Panel E presents the result of the full-model regression in Eq. (6): We find that the coefficients of $ACC^{dec} * FORV\_H$ and $ACC^{dec} * STDV\_H$ are significantly positive, while the coefficient of $ACC^{dec} * LTDV\_H$ is insignificant. These results are consistent with those reported in Panels B to D of Table 8, suggesting that the mispricing of accruals is mitigated for such firms whose shares are traded more intensely by foreign and domestic short-term institutions, while it is not affected by trading by domestic long-term institutions. In short, the results reported in Table 8, taken together, imply that trading by foreign investors and domestic short-term institutions mitigates the mispricing of accruals by facilitating the incorporation of firm-specific information into stock prices.

8. Summary and concluding remarks

Using a large sample of firms listed on the KSE over 1998–2007, this paper investigates whether and how trading by foreign and domestic institutional investors impacts the incorporation of firm-specific information into stock prices, captured by stock price synchronicity. Our results reveal the following. First, stock price synchronicity decreases significantly with the intensity of trading by foreign investors and domestic institutions. Second, among domestic institutions with differing investment horizons, short-term institutions such as securities and investment trust companies play a more important role in facilitating firm-specific information flow to the market via their trading activities than long-term institutions such as banks and insurance companies. Third, we show that trading by foreign investors and domestic short-term institutions facilitates firm-specific information flow to a greater extent than trading by long-term domestic institutions. Fourth, the above findings are robust to potential endogeneity biases and an alternative measure of firm-specific information flow. We also find that it is institutional trading, and not institutional shareholdings, which facilitates the incorporation of firm-specific information into stock prices. Finally, we provide further evidence that the trading activities of foreign and domestic short-term institutions reduce accrual mispricing, while those of domestic long-term institutions do not.

Overall, our results are consistent with the view that foreign and domestic short-term institutions in emerging markets are more actively involved in information-based trading than domestic long-term institutions, and, thus, that the trading activities of the former facilitate the incorporation of firm-specific information into stock prices to a greater extent than the trading activities of the latter. However, since our analyses are performed in an emerging economy where firm ownership is typically concentrated in the hands of a few controlling shareholders and large business groups play a dominant role, we caution against generalizing our results to other developed economies with diffuse ownership and strong corporate governance. Given the scarcity of empirical evidence on the informational role of shareholdings and trading by foreign institutions vis-à-vis domestic institutions, we recommend further research on the economic consequences of foreign versus domestic institutional trading in other contexts, including the effect on the cost of capital, firm valuation and the efficiency of capital allocation and investment in emerging markets.

Acknowledgments

We thank Charles Chen, Michael Firth, Joseph Fan, Ying-hua Li, Annie Qiu, Dan Simunic, Byron Song, Michael Stein, Xiaodong Xu, Jerry Zimmerman and participants of presentations at PolyU's China Accounting and Finance Research Symposium, the Accounting Research Workshops at UBC's Sauder School of Business, Concordia University, City University of Hong Kong, The Hong Kong Polytechnic University, and

[20] Each reported coefficient represents the average of the estimated coefficients from ten annual regressions. Each reported *t*-value is computed using the empirical distribution of ten annual coefficients (after correcting for serial correlation).

[21] As reported in Table 8, the coefficient of *SIZE* is positively significant, which is not consistent with the finding of Sloan (1996). However, it is consistent with the international evidence on the accrual anomaly for some of the code-law countries reported in Pincus et al. (2007).

Seoul National University for their helpful comments and suggestions on earlier versions of the paper. All errors and omissions are our own.

Appendix A. Alternative measure of firm-specific information flow

We use the probability of informed trading (*PIN*) developed by Easley et al. (2002) as an alternative dependent variable in our study. The variable *PIN* is measured using a structural market microstructure model where trade comes from either informed or uninformed traders. On a day with no information events, uninformed buyers and uninformed sellers arrive at the rates of ε_b and ε_s, respectively. Information events occur with probability α. Information events are either good news with probability $(1-\delta)$, or bad news with probability δ. Let μ denote the arrival rate of informed traders when an information event occurs. Informed traders will buy when they observe good news and will sell upon observing bad news. Thus, on bad event days, the arrival rate of buy orders is ε_b and the arrival rate of sell orders is $\varepsilon_s + \mu$. On good event days, the arrival rate of buy orders is $\varepsilon_b + \mu$ and the arrival rate of sell orders is ε_s. Easley et al. (2002) show that, under certain conditions, *PIN* for a stock in a given period is measured as

$$PIN = \frac{\alpha\mu}{\alpha\mu + \varepsilon_s + \varepsilon_b} \tag{a1}$$

where $\alpha\mu$ is the arrival rate for information-based orders and $\alpha\mu + \varepsilon_s + \varepsilon_b$ is the arrival rate of all orders. The variable *PIN* measures the probability of information-based trading by informed traders. To obtain the annual *PIN* measure for each firm in our sample, transaction data are retrieved from the Trade and Quote database provided by the Institute of Finance and Banking (IFB) of Seoul National University (IFB/KSE database). The IFB-KSE database has each order time-stamped with the time it arrived at the exchange and the time the order was executed, which allows us to identify whether a specific order was initiated by a buyer or a seller. Based on the number of daily buys and sells for each trading day, we obtain $\theta = (\mu, \varepsilon_b, \varepsilon_s, \alpha, \delta)$ to maximize the likelihood function for the total number of buys and sells on a single day, for each stock in each year. We then compute yearly *PIN* measures for each stock using the formula in Eq. (a1).

Appendix B. Variable definitions

Variable		Definition
Panel A: Stock price synchronicity		
R^2	=	coefficient of determination from the estimation of the firm–year estimation of the model in Eq. (1)
Synch	=	stock price synchronicity measured by $\log[R^2/(1-R^2)]$
Panel B: Probability of informed trading measure		
PIN	=	annual probability of information-based trading measure of Easley et al. (2002)
Panel C: Variables of interest used in main regressions		
FORV	=	sum of total shares purchased and sold by non-resident foreign investors as a fraction of annual trading volume
DOMV	=	sum of total shares purchased and sold by domestic institutional investors as a fraction of annual trading volume ($DOMV = STDV + LTDV$)
STDV	=	sum of total shares purchased and sold by domestic securities and investment trust companies as a fraction of annual trading volume
LTDV	=	sum of total shares purchased and sold by domestic insurance companies and banks as a fraction of annual trading volume
Panel D: Control variables		
$\log(1 + \#ANAL)$	=	log(1 + number of analysts following)
$\log MVE$	=	log of market capitalization

LEV	=	total debt/total asset
MB	=	market value of equity/book value of equity
SROA	=	standard deviation of ROA measured over the past five years using 10 half-yearly observations
HERFIN	=	sales revenue-based Herfindahl index of industry-level concentration
CHAEBOL	=	1 if a firm belongs to one of the 30 largest chaebols, and 0 otherwise
GDR	=	1 if a firm is cross-listed, and 0 otherwise
*BIG*4	=	1 if a local auditor is a member of a Big 4 firm, and 0 otherwise
AveVol	=	average daily trading volume/shares outstanding

References

Aggarwal, R., Erel, I., Ferreira, M., Matos, P., 2011. Does governance travel around the world? Evidence from institutional investors. J. Financ. Econ. 100, 154–181.

Ahearne, A., Griever, W., Warnock, F., 2004. Information costs and home bias: an analysis of U.S. holdings of foreign equities. J. Int. Econ. 62, 313–336.

Albuquerque, R., Bauer, G., Schneider, M., 2009. Global private information in international equity markets. J. Financ. Econ. 94, 18–46.

Ashbaugh-Skaife, H., Gassen, J., LaFond, R., 2006. Does Stock Price Synchronicity Represent Firm-Specific Information? The International Evidence. MIT Sloan Research Paper No. 4551-05. SSRN. <http://ssrn.com/abstract=768024>.

Aslan, H., Easley, D., Hvidkjaer, S., O'Hara, M., 2007. Firm Characteristics and Informed Trading: Implications for Asset Pricing. Working Paper. SSRN. <http://ssrn.com/abstract=1334465>.

Bae, K.-H., Chan, K., Ng, A., 2004. Investability and return volatility. J. Financ. Econ. 71, 239–263.

Bae, K.-H., Ozoguz, A., Tan, H., Wirjanto, T.S., 2012. Do foreigners facilitate information transmission in emerging markets? J. Financ. Econ. 105, 209–227.

Baek, J., Kang, J., Park, K.S., 2004. Corporate governance and firm value: evidence from the Korean financial crisis. J. Financ. Econ. 71, 205–415.

Barron, O., Byard, D., Kim, O., 2002. Change in analysts' information around earnings announcements. Acc. Rev. 77, 821–846.

Bekaert, G., Harvey, C.R., 2000. Foreign speculators and emerging equity markets J. Financ. 55, 565–613.

Bekaert, G., Harvey, C.R., Lundblad, C., 2005. Does financial liberalization spur growth? J. Financ. Econ. 57, 3–55.

Bradshaw, M., Bushee, B., Miller, G., 2004. Accounting choices, home bias, and U.S. investment in non-U.S. firms. J. Acc. Res. 42, 795–841.

Brennan, M.J., Cao, H.H., 1997. International portfolio investment flows. J. Financ. 52, 1855–1880.

Bushee, B., 1998. The influence of institutional investors on myopic R&D investment behavior Acc. Rev. 73, 305–333.

Bushee, B., 2001. Do institutional investors prefer near-term earnings over long-run value? Contemp. Acc. Res. 18, 207–246.

Chakravarty, S., 2001. Stealth trading: which trades move stock prices? J. Financ. Econ. 61, 289–307.

Chan, K., Hameed, A., 2006. Stock price synchronicity and analyst coverage in emerging markets. J. Financ. Econ. 80, 115–147.

Chen, Q., Goldstein, I., Jiang, W., 2007. Price informativeness and investment sensitivity to stock prices. Rev. Financ. Stud. 20, 619–650.

Choe, H., Kho, B.-C., Stulz, R., 1999. Do foreign investors destabilize stock markets? The Korean experience in 1997. J. Financ. Econ. 54, 170–180.

Choi, J.H., Kim, J.-B., Liu, X., Simunic, D.A., 2008. Cross Listing Audit Fee Premiums: Theory and Evidence. Working Paper. University of British Columbia, Vancouver, Canada.

Choi, J.H., Wong, T.J., 2007. Auditors' governance functions and legal environments: an international investigation. Contemp. Acc. Res. 24, 14–46.

Christoffersen, S., Sarkissian, S., 2009. City size and fund performance. J. Financ. Econ. 92, 252–275.

Covrig, V.M., Lau, S., Ng, L., 2006. Do domestic and foreign fund managers have similar preferences for stock characteristics? A cross-country analysis. J. Int. Busin. Stud. 37, 407–429.

Dahlquist, M., Robertsson, G., 2001. Direct foreign ownership, institutional investors, and firm characteristics. J. Financ. Econ. 59, 413–440.

Del Guercio, D., 1996. The distorting effect of the prudent-man laws on institutional equity investment J. Financ. Econ. 40, 31–62.

Durnev, A., Morck, R., Yeung, B., Zarowin, P., 2003. Does greater firm-specific return variation mean more or less informed stock pricing? J. Acc. Res. 41, 797–836.

Easley, D., Hvidkjaer, S., O'Hara, M., 2002. Is information risk a determinant of asset returns? J. Financ. 57, 2185–2221.

Fan, J.P.H., Wong, T.J., 2005. Do external auditors perform a corporate governance role in emerging markets? Evidence from East Asia J. Acc. Res. 43, 35–72.

Fernandes, N., Ferreira, M.A., 2008. Does international cross-listing improve the information environment? J. Financ. Econ. 88, 216–244.

Ferreira, M.A., Laux, P.A., 2007. Corporate governance, idiosyncratic risk, and information flow. J. Financ. 62, 951–989.

Froot, K.A., Ramadorai, T., 2008. Institutional portfolio flows and international investments. Rev. Financ. Stud. 21, 937–971.

Gillian, S., Starks, L., 2003. Corporate governance, corporate ownership, and the role of institutional investors: a global perspective. J. Appl. Financ. 13, 4–22.
Grinblatt, M., Keloharju, M., 2000. The investment behavior and performance of various investment types: a study of Finland's unique data set. J. Financ. Econ. 55, 43–67.
Grossman, S.J., Stiglitz, J.E., 1980. On the possibility of informationally efficient markets. Am. Econ. Rev. 70, 393–408.
Gul, F., Kim, J.-B., Qiu, A., 2010. Ownership concentration, foreign shareholding, audit quality and firm-specific return variation: evidence from China. J. Financ. Econ. 95, 425–442.
Hameed, A., Morck, R., Shen, J., Yeung, B., 2010. Information, Analyst, and Stock Return Comovement. NBER Working Paper No. 15833.
Hartzell, J., Starks, L., 2003. Institutional investors and executive compensation. J. Financ. 58, 2351–2374.
Hau, H., 2001. Location matters: an examination of trading profits. J. Financ. 56, 1951–1983.
Henry, P.B., 2000. Do stock market liberalizations cause investment booms? J. Financ. Econ. 58, 301–334.
Hubbard, R.G., Palia, D., 1999. A re-examination of the conglomerate merger wave in the 1660s: an internal capital market view. J. Financ. 54, 1131–1152.
Hutton, A.P., Marcus, A.J., Tehranian, H., 2009. Opaque financial reports, R^2, and crash risk. J. Financ. Econ. 94, 67–86.
Jacobson, R., Aaker, D., 1993. Myopic management behavior with efficient, but imperfect financial markets: a comparison of information asymmetries in the U.S. and Japan. J. Acc. Econ. 16, 383–405.
Jiambalvo, J., Rajgopal, S., Venkatachalam, M., 2002. Institutional ownership and the extent to which stock prices reflect future earnings. Contemp. Acc. Res., 127–145
Jiang, L., Kim, J.-B., 2004. Foreign equity ownership and information asymmetry in Japan. J. Int. Financ. Manage. Acc. 15, 185–211.
Jin, L., Myers, S., 2006. R^2 around the world: new theory and new tests. J. Financ. 79, 257–292.
Joh, S.W., 2003. Corporate governance and firm profitability: evidence from Korea before the economic crisis. J. Financ. Econ. 68, 287–322.
Kang, J.-K., Stulz, R.M., 1997. Why is there a home bias? An analysis of foreign portfolio equity ownership in Japan. J. Financ. Econ. 46, 3–28.
Karolyi, A., 2002. Did the Asian financial crisis scare foreign investors out of Japan? Pacif.-Basin Financ. J. 10, 411–442.
Karolyi, A., Stulz, R., 2003. Are assets priced locally or globally? In: Constantinides, G., Harris, M., Stulz, R. (Eds.), The Handbook of the Economics of Finance. North-Holland Publishers, New York.
Khanna, T., Palepu, K., 2000. Is group affiliation profitable in emerging markets? An analysis of diversified Indian business groups. J. Financ. 55, 867–891.
Kim, J.-B., Chung, R., Firth, M., 2003. Auditor conservatism, asymmetric monitoring and discretionary accrual choices. Contemp. Acc. Res. 20, 323–360.
Kim, J.-B., Shi, H., 2010. Voluntary IFRS Adoption and Stock Price Synchronicity: Do Analyst Following and Institutional Infrastructure Matter? Working Paper. City University of Hong Kong, Hong Kong, Fudan University.
Kim, O., Verrecchia, R., 1994. Market liquidity and volume around earnings announcements. J. Acc. Econ. 17, 41–67.
Kim, O., Verrecchia, R., 1997. Pre-announcement and event-period private information. J. Acc. Econ. 24, 395–419.
Kim, J.-B., Yi, C.H., 2006. Ownership structure, group affiliation, listing status and earnings management: evidence from Korea. Contemp. Acc. Res. 23, 427–464.
Leuz, C., Lins, K.V., Warnock, F.E., 2009. Do foreigners invest less in poorly governed firms? Rev. Financ. Stud., 3245–3285
Mitton, T.A., 2002. Cross-firm analysis of the impact of corporate governance on the East Asian financial crisis. J. Financ. Econ. 64, 215–241.
Morck, R., Yeung, B., Yu, W., 2000. The information content of stock markets: why do emerging markets have synchronous stock price movements? J. Financ. Econ. 58, 215–260.
Petersen, M.A., 2009. Estimating standard errors in finance panel data sets: comparison approaches. Rev. Financ. Stud. 22, 435–480.
Pincus, M., Rajgopal, S., Venkatachalam, M., 2007. The accruals anomaly: international evidence. Acc. Rev. 82, 169–203.
Piotroski, J.D., Roulstone, D.T., 2004. The influence of analysts, institutional investors, and insiders on the incorporation of market, industry, and firm-specific information into stock prices. Acc. Rev. 79, 1119–1151.
Reed, B., Trombley, M., Dhaliwal, D., 2000. Demand for audit quality: the case of Laventhol and Horwath's auditees. J. Acc. Audit. Financ. 15, 183–198.
Roll, R., 1988. R^2. J. Financ. 25, 545–566.
Seasholes, M., 2004. Re-examining Information Asymmetries in Emerging Stock Markets. Working Paper. University of California at Berkeley.
Shukla, R.K., Inwegen, G.B. van, 1995. Do locals perform better than foreigners? An analysis of UK and US mutual fund managers. J. Econ. Busin. 47, 241–254.
Sloan, R.G., 1996. Do stock prices fully reflect information in accruals and cash flows about future earnings? Acc. Rev. 71, 289–315.
Stulz, R.M., 1999. Globalization and the Cost of Equity Capital. Working Paper No. 99-02. New York Stock Exchange.
Teoh, S.H., Yang, Y., Zhang, Y., 2008. R-Square: Noise or Firm-Specific Information? Working Paper.
Yan, X., Zhang, Z., 2009. Institutional investors and equity return: are short-term institutions better informed? Rev. Financ. Stud. 22, 893–924.

China Journal of Accounting Research 8 (2015) 25–39

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China Journal of Accounting Research

journal homepage: www.elsevier.com/locate/cjar

The costs of socializing with government officials: A new measure of corporate political connections

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ARTICLE INFO

Article history:
Received 7 January 2013
Accepted 31 October 2014
Available online 26 December 2014

Keywords:
Political connections
Turnover of officials
Political networking expenditures

ABSTRACT

We construct a new measure to capture corporate political connections, which is based on the amount a corporation spends on socializing with government officials. We examine the validity of this measure using the exogenous turnover of top local officials and find that firms increase their political networking expenditures when top local officials are replaced. Compared to state-owned enterprises (SOEs), non-state-owned enterprises (non-SOEs) react more aggressively to changes in local officials, which implies that non-SOEs have stronger incentives to build political connections with officials through social intercourse. We also find that firms located in regions with low levels of marketization react more aggressively to the turnover of local politicians. In addition, we find a positive effect of corporate political socializing expenditures on corporate performance and valuation, which suggests that political connections built through social intercourse benefit corporations.

1. Introduction

Due to the lack of comprehensive formal legal and governance mechanisms, remarkably effective alternative mechanisms have developed in China (Allen et al., 2005). Political connections are one such mechanism and they play an important role in the Chinese economic regime. Most previous studies of corporate political connections have used the presence or absence of state ownership or the political background of top executives

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http://dx.doi.org/10.1016/j.cjar.2014.10.003
1755-3091/

to identify firms' connections. In fact, connections between corporations and the government can be built via other channels and it is meaningful to identify other important corporate strategies for building political connections.

Networking with government officials is a common corporate political strategy in the relationship-based Chinese regime. Unlike ownership-based or board member political experience-based political connections, the strategy of socializing with government officials is implemented through various social activities that are part of daily business practices and it is thus hard to capture explicitly. Although the political strategy of social intercourse has been discussed in previous studies, there is little empirical research that systematically identifies it. One exception is Luo and Ying (2012) who use a particular social activity, company visits of officials, to identify corporate political connections. In this study, we try to comprehensively capture corporate political connections built through social intercourse by measuring corporations' expenditures on political networking. We use evidence from a previous survey to construct a variable for measuring corporate expenditures on networking with government officials.

Zhang and Zhang (2005) surveyed hundreds of Chinese entrepreneurs and found that firms socialize with government officials in a number of ways including inviting them for a company visit, sponsoring overseas travel, offering gifts, holding banquets, and so on. Based on their research, we use the accounting items that are most commonly used to reimburse such expenditures to construct a measure of political networking expenditures. One of the contributions of this study is determining the validity of this measure using the exogenous turnover of top local officials. We find that firms increase their expenditures for socializing with government officials when local politicians are replaced. This suggests that our measure effectively captures firms' expenditures on political social intercourse.

We further find that non-SOEs react more aggressively than SOEs when local politicians are replaced and that firms located in regions with a low level of marketization react more aggressively to the turnover of top local officials. We also use our new measure of political connections to examine the economic consequences of political networking expenditures. Consistent with previous studies (see among others, Fisman, 2001; Johnson and Mitton, 2003; Faccio, 2006), we find that corporate political socializing expenditures have a positive effect on corporate performance and valuation, which suggests that the political connections built through social intercourse benefit corporations.

Our study makes the following contributions to the literature. First, we construct a new measure to capture corporate political connections, namely political socializing expenditures. Second, socializing with officials is a common corporate political strategy that has rarely been mentioned in previous empirical studies, perhaps because of the difficulty in quantifying political socializing. This study quantifies corporate political socializing by measuring corresponding expenditures and testing the validity of this measure by using the exogenous turnover of top local officials. Third, there are few empirical studies of the firm-level effect of the turnover of government officials in China and this study sheds some light on this research area.

The rest of this paper is structured as follows. Section 2 discusses the related literature and hypotheses. Section 3 describes the sample selection and data. Section 4 provides the research design and empirical results. In Section 5 we present our conclusions.

2. Literature review and hypotheses

Corporate political connections play an important role around the world (see among others, Fisman, 2001; Faccio, 2006; Faccio et al., 2006; Adhikari et al., 2006; Niessen and Ruenzi, 2010; Chen et al., 2010). In Chinese studies, corporate political connections are generally correlated with the type of ownership (SOE vs. non-SOE) or the political experience of top executives (e.g. Hu, 2006; Yu and Pan, 2008). US studies have documented a variety of strategies used by firms to make political connections, such as adding politicians to the board of directors (e.g. Goldman et al., 2008, 2009), making significant political campaign contributions (e.g., Cooper et al., 2010; Claessens et al., 2008), or incurring significant lobbying expenditures (e.g., Hill et al., 2009; Chen et al., 2009).

Unlike the US, lobbying does not publicly exist in China. However, Chinese firms can seek preferential treatment through their private networking channels. Zhang and Zhang (2005) surveyed hundreds of entrepreneurs in Wenzhou City and Suzhou Province and found that firms build political networks by socializing with

government officials. Generally, firms interact with government officials by inviting them for a company visit, holding a banquet, sponsoring the officials' travel abroad, offering gifts, and so on.

Following Cai et al. (2011) and Zhang and Zhang (2005), we select the following accounting items as the most commonly used to reimburse the expenses related to the above-mentioned activities, i.e. travel expenses, entertainment expenses, overseas training expenses, conference expenses, social expenses and clerical expenses. Although not all of these expenses will be directly related to political socializing, Cai et al. (2011) show that entertainment and travel expenses increase firm value, which suggests that this kind of expenditure is related to political connections. In this study, we try to capture socializing-based political connections by measuring political networking expenditures.

Leuz and Oberholzer-Gee (2006) find that when the political regime changed in Indonesia (i.e., after Suharto's resignation), the firms once closely connected to Suharto systematically changed their financing strategy from domestic financing to global financing. This result illustrates that the loss of political ties due to the turnover of politicians can change corporate financing strategies. However, few studies have investigated the effect of the turnover of politicians on corporate behavior in China, where corporate behavior is seen as government dominated. As an anecdotal case, Feng Lun, the Chairman of Vantone Holdings, said that "On average, I fly long-haul 180 times a year; two-thirds of these trips are related to the turnover of government officials, because the successors may renege on previous promises or agreements..."[1] This implies that the turnover of government officials breaks existing corporate-government connections.

In this study, we test the effect of top local government official turnover on corporate political socializing strategies and predict that corporate expenditures on socializing with officials increase when top local officials are replaced. The following policy risk argument and political connection theory support our view.[2]

The replacement of top local officials may create policy uncertainty (Julio and Yook, 2012). A corporate proposal might be adopted more easily by a policy maker who is part of a well-built network; thus networking reduces policy risk. Local government, as the top administration agency in a municipal region, has the power to allocate resources; thus, firms have incentives to build political connections with local government to get access to valuable resources. An incumbent political tie will be broken when a top local official is replaced; therefore, firms have incentives to socialize with successors to re-build the political tie. Based on this analysis, we predict that expenditures on political socializing will increase when a top local official is replaced. Our first hypothesis is as follows.

H1. When turnover of top local officials occurs, corporate expenditures on political networking increase.

Firms with few natural political connections have more incentive to network with government officials. Compared to SOEs, non-SOEs have more incentive to establish political connections. Currently, the property protection regime is relatively weak in China. Non-SOEs that pay more attention to property protection pursue political connections as an alternative protection mechanism (e.g. Bai et al., 2006). In addition, China is a centrally planned system undergoing a slow and uneven transition to a market economy. The government has the power to allocate resources, such as bank loans (see among others, Hu, 2006; Yu and Pan, 2008; Zhang et al., 2010; Lian et al., 2011), access to regulated industries (Luo and Liu, 2009), government subsidies (Chen, 2003; Pan et al., 2009; Yu et al., 2010) and so on. To obtain their preferred resource allocations, non-SOEs have more incentive to establish and maintain political connections. Based on this analysis, we predict that non-SOEs will socialize more aggressively when top local officials change, relative to SOEs. The hypothesis is as follows.

H2. Compared to SOEs, non-SOEs' expenditures on political networking will respond more aggressively to top local official turnover.

Previous studies have suggested that firms in poor institutional environments are more motivated to establish political connections. Faccio (2006) shows that corporate political connections are more common in countries with weak legal regimes and severe corruption. Li et al. (2006) find that private entrepreneurs

[1] Quoted from "The Choices of Entrepreneurs in social transition period," Feng Lun, 2013, *Decision Guidance,* March Issue.
[2] In this study, we focus on the political connection perspective.

are more likely to go into politics in regions with strong government intervention and poor financial development. Yu and Pan (2008) and Luo and Zhen (2008) find that political connections are more valuable for the firms in regions with low levels of marketization. Based on the above findings, we examine the effect of the level of regional marketization on corporate political networking expenditures. We use the number of listed firms in a city as a city-level marketization index and predict that corporations will increase political socializing expenditures more aggressively in response to the replacement of top local officials if the level of regional marketization is low. The hypothesis is as follows.

H3. The lower the level of regional marketization, the more aggressively corporate political networking expenditures react to the turnover of top local politicians.

3. Data and sample

Our sample consists of firms with A-shares listed on either the Shenzhen or the Shanghai Stock Exchanges in the 2006–2010 period. Accounting and corporate governance data are obtained from the China Stock Market and Accounting Research (CSMAR) database. The raw data on corporate expenditures on socializing with government officials are hand-collected from the footnote of annual reports entitled "Cash flow paid relating to other operating activities."[3] We select the accounting categories that best reflect political networking expenditures, i.e., travel expenses (Chai Lu Fei Yong), entertainment expenses (Ye Wu Zhao Dai Fei Yong), overseas training expenses (Chu Guo Pei Xun Fei), meeting expenses (Hui Yi Fei Yong), social expenses (Jiao Ji Ying Chou Fei Yong) and clerical expenses (Ban Gong Fei Yong). We exclude financial firms and firms that do not disclose any of the above-mentioned expenses in a fiscal year. Panel A of Table 1 summarizes the distribution of the observations by year. It shows that nearly 40% of non-financial listed companies disclose the above-mentioned expense categories in each sample year. Panel B shows the distribution of the observations by industry. The mean of all expenses is as high as 153 million yuan in the construction industry and the mean of the ratio of expenses to sales has the highest value (41.4%) in the manufacturing industry. Panel C shows the distribution of observations by year and the type of ownership. The raw expenses are much higher in the SOE group, but the ratio of expenses to sales is highest in the non-SOE group.

Province-level and city-level top official turnover data are hand-collected from People Web[4] and local government websites. To account for the lag effect of official turnover, we collect the turnover data from 2005 to 2009. The sample covers 31 provinces (including provincial-level cities and autonomous regions) and hundreds of cities (including deputy provincial-level cities, prefecture-level cities, autonomous prefectures, municipal districts and cities administrated by a province). Generally, the top officials in a province are the provincial governor and the provincial secretary of the municipal Party committee. The top officials in a city are the mayor and the secretary of the municipal Party committee.

Panel A of Table 2 shows the number and proportion of firms in the sample (i.e., all non-financial listed firms that provide the necessary data on expenditures) and in the general population (i.e., all non-financial listed firms) that experience province-level top official turnover by year. The percentage of sample firms that experience official turnover is 34.21%, which is very close to the proportion in the general population (34.65%). In each year, the proportion of turnovers in the sample is similar to the one in the general population. These statistics illustrate that on average, approximately 30% of listed firms experience province-level top official turnover. Therefore understanding the effect of official turnover on firms is of great practical significance. Furthermore, in each year the proportion of firms in the sample that experience turnover is similar to the proportion of firms in the general population that experience turnover, suggesting that our sample does not have any selection bias problems. As there are 31 provinces in China, we further collect data on city-level top official turnover to provide more data and to analyze the turnover effect more accurately.

Panel B of Table 2 reports the number and proportion of firms that experience the turnover of city-level top officials in the sample group and in the general population by year. For each year, about 35 percent of the

[3] Since 2009, many firms have disclosed detailed items of management expenses in footnotes. These could be an alternative data resource to the footnote item "cash flow paid relating to other operating activities."

[4] Website: http://www.people.com.cn/.

Table 1
Sample distribution.

Year	Number of all non-financial listed firms (1)	Number of sample firms that disclose expenses[a] (2)	Percentage = (2)/(1) (%)
Panel A: Sample selection			
2006	1314	476	36.23
2007	1395	493	35.34
2008	1508	725	48.08
2009	1559	763	48.94
2010	1666	735	44.12
Total	7442	3192	42.89

Industry	Observations	Mean	Min	Max	Expenses/Sales
Panel B: Expenses by industry (in units of ten thousand)					
Mining and Quarrying	86	6300.161	198.576	46248.580	0.006
Communication and Culture	17	1960.368	181.919	6310.508	0.057
Electricity, Gas, and Water	143	1939.411	81.846	14765.130	0.010
Real Estate	92	1269.452	57.620	4725.063	0.032
Construction	64	15336.820	487.888	231571.100	0.010
Transport, Storage	137	4060.865	96.139	70783.670	0.014
Farming, Forestry, and Animal Husbandry and Fishery	77	1799.931	144.481	9065.108	0.014
Wholesale and Retail Trade	201	2605.560	77.547	25770.000	0.008
Community Service	83	1400.274	59.523	26885.760	0.032
Information Technology	217	3279.027	36.078	34452.060	0.051
Manufacturing	1999	2489.368	21.707	55500.000	0.414
Other	76	1550.808	64.254	8154.706	0.036
Total	3192	2848.168	21.707	231571.100	0.035

	Non-SOEs				SOEs			
Year	Observations	Mean	Min	Max	Observations	Mean	Min	Max
Panel C: Expenses by type of ownership (in units of ten thousand)								
2006	154	1468.71	37.332	21,690	322	2164.585	44.0653	21733.58
2007	170	1782.174	49.0553	24,960	323	2733.266	21.7072	55,500
2008	279	1855.704	57.6206	35,320	446	3464.782	59.8487	153,500
2009	374	2412.249	36.0783	39139.11	389	3632.104	73.6892	183516.9
2010	356	2773.168	59.5237	46248.58	379	4266.515	47.2840	231571.1
Total	1333	2,200	36	46,000	1859	3,300	22	230,000

	Non-SOEs		SOEs	
Year	Observations	Mean	Observations	Mean
Panel D: Ratio of expenses to sales by type of ownership				
2006	154	0.027	322	0.0211
2007	170	0.0315	323	0.014
2008	279	0.0308	446	0.015
2009	374	0.0293	389	0.015
2010	356	0.147	379	0.014
Total	1333	0.061	1859	0.015

[a] The observations in the sample are the firm-year observations that disclose expense data and the other data used as control variables.

sample companies experience the replacement of top officials. This is very close to the percentage of non-financial A share-listed companies, namely 36 percent, that experience such replacement in the same period, implying that our sample does not have any selection bias issues.

In a given year, the top official turnover variable is province- or city- fixed. In addition to the above firm-year statistic, Table 2 summarizes the distribution of top official turnover (TOT) events by province and city. Panel C of Table 2 shows that all of the 31 provinces are included in our sample and that there are sample companies in every province in which replacement of top officials occurs. In 2007, the number of provinces experiencing top official turnover is extremely high, because the 17th National Congress of the Communist Party of China occurred in that year, and lead to many changes. Except for 2007, the turnover of top officials is evenly distributed throughout the sample period.

Table 2
Top local official turnover.

	All non-financial listed firms			Sample firms		
Year	Observations (1)	PTOT (2)	Percentage = (2)/(1) (%)	Observations (3)	PTOT (4)	Percentage = (4)/(3) (%)
Panel A: Province-level top official turnover (PTOT) by firm-year						
2005	1314	303	23.06	476	95	19.96
2006	1395	694	49.75	493	248	50.30
2007	1508	1126	74.67	725	515	71.03
2008	1559	59	3.78	763	39	5.11
2009	1666	397	23.83	735	195	26.53
Total	7442	2579	34.65	3192	1092	34.21
	All non-financial listed firms			Sample firms		
Year	Observations (1)	PTOT (2)	Percentage = (2)/(1) (%)	Observations (3)	PTOT (4)	Percentage = (4)/(3) (%)
Panel B: City-level top official turnover (CTOT) by firm-year						
2005	1314	356	27.09	476	134	28.15
2006	1395	557	39.93	493	194	39.35
2007	1508	524	34.75	725	259	35.72
2008	1559	544	34.89	763	272	35.65
2009	1666	584	35.05	735	227	30.88
Total	7442	2565	34.47	3192	1080	33.83

# Provinces				# Provinces that experience PTOT			
Year	# provinces covered by all non-financial firms (1)	# provinces covered by sample firms (2)	Percentage = (2)/(1) (%)	# provinces that experience PTOT covered by all non-financial firms (3)	# provinces that experience PTOT covered by sample firms (4)	Percentage of provinces that experience PTOT in all non-financial firms = (3)/(1) (%)	Percentage of provinces that experience PTOT in sample firms = (4)/(2) (%)
Panel C: Province-level top official turnover (PTOT) by province							
2005	31	31	100	6	6	19.35	19.35
2006	31	31	100	12	12	38.71	38.71
2007	31	31	100	22	22	70.97	70.97
2008	31	31	100	7	7	22.58	22.58
2009	31	31	100	7	7	22.58	22.58
Total	31	31	100	31	31	100.00	100.00

# Cities				# Cities that experience CTOT			
Year	# cities covered by all non-financial firms (1)	# cities covered by sample firms (2)	Percentage = (2)/(1) (%)	# cities that experience CTOT covered by all non-financial firms (3)	# cities that experience CTOT covered by sample firms (4)	Percentage of cities that experience CTOT in all non-financial firms = (3)/(1)	Percentage of cities experienced CTOT in sample firms = (4)/(2) (%)
Panel D: City-level top official turnover (CTOT) by city							
2005	273	169	61.90	68	42	24.91%	24.85
2006	280	171	61.07	155	87	55.36%	50.88
2007	284	206	72.54	84	62	29.58%	30.10
2008	284	209	73.59	140	100	49.30%	47.85
2009	288	215	74.65	64	43	22.22%	20.00
Total	297	246	82.83	281	206	94.61%	83.74

Panel D of Table 2 shows that the sample covers about 70 percent of the cities that have non-financial listed companies. Although our sample is limited by insufficient data disclosure, a very large percentage of cities are included in the sample. In addition, the proportion of cities that experience top official turnover in the sample is very similar to the proportion of non-financial listed firms on a year-by-year basis, which suggests our sample does not have any sample selection bias problems. Each year nearly 40 percent of the cities experience top official replacement, confirming the need to analyze the effects of this common event.

Table 3
Variable definitions.

Dependent variables	
AbLnExpense	Measures corporate political networking expenditures; equals the residual value of model 1
Variables of interest	
PTO	PTO equals 1 if top officials of the province-level region where firm i is located are replaced in year $t-1$, and 0 otherwise
CTO	CTO equals 1 if top officials of the city-level region where firm i is located are replaced in year $t-1$, and 0 otherwise
NUM	The number of listed firms in a city
NUM_1	Ranked variable. NUM_1 equals 10 if the number of listed firms in a city is in the top 10%; NUM_1 equals 9 if the number of listed firms in a city is in the top 10% to top 20%, etc. NUM_1 equals 1 if the number of listed firms in a city is in the bottom 10%
CTO SOE*	Interaction of CTO and SOE
CTO NUM*	Interaction of CTO and NUM
CTO NUM_1*	Interaction of CTO and NUM_1
Control variables	
Size	Natural log of total assets
SOE	Stated-owned enterprise dummy; SOE equals 1 if the firm is a state-owned enterprise, and 0 otherwise
Lsh	The shareholding percentage of the largest shareholder
ROA	Return on Assets, which equals Net Income divided by Average Total Assets
Leverage	Total liabilities/total assets
MB	Market-to-Book, which is the market value of equity divided by the book value of equity
Msh	Manager shareholding percentage, which equals the managers' shareholding divided by liquid shares
BoardSize	Number of directors on the board
LnComp	Natural log form of top management's top 3 compensation amounts
Revenue	Natural log of total sales
InDir	InDir equals 1 if the proportion of independent directors on the board is more than or equal to 1/3, and 0 otherwise
RegionLevel	*RegionLevel* equals 2 if the company is located in Beijing, Shanghai, Guangzhou, or Shenzhen; *RegionLevel* equals 1 if the company is located in other provincial capital cities, deputy province cities, or sub-provincial cities; and 0 otherwise
FirmAge	Age of the firm
Industry	Industry dummies, which equal 1 if the observation belongs to each particular industry, and 0 otherwise
Year	Year dummies, which equal 1 if the observation belongs to a particular year, and 0 otherwise

4. Research design

4.1. Variable definitions

Variable definitions are provided in Table 3. The key variables of interest are political networking expenditures (*AbLnExpense*) and top local official turnover by province (*PTO*) and city (*CTO*).

We use the residual of model (1) as the measure of corporate political networking expenditures (*AbLnExpense*). Basically, the above-mentioned expenses can be divided into three parts: normal firm operating expenditures, management perks and political socializing expenditures. However, it is difficult to separate political networking expenditures from managers' perks and the measurement power of the variable is reduced if management perks are excluded from the expenses.[5] Therefore, we retain management perks but control for the variables that influence normal operating expenditures in model (1) and control for the factors that affect management perks in the follow-up main regressions to diminish the potential for measurement noise.

We use model (1) to predict the residual (*AbLnExpense*) by industry.

$$LnExpense = \gamma_0 + \gamma_1 Size + \gamma_2 Revenue + \gamma_3 RegionLevel + \varepsilon \quad (1)$$

[5] For instance, corporate executives may treat government officials to a dinner. This activity may have the characteristics of both a management perk and political socializing. Thus, the power of our political socializing expenditure measure will be reduced if we comprehensively eliminate the factors related to management perks in model (1).

Table 4
Descriptive statistics.

	N	Mean	Median	Min	Max	s.d.
Panel A Descriptive statistics of continuous variables						
AbLnExpense	3192	0.09	0.09	−2.81	3.08	0.95
Size	3192	21.49	21.39	17.12	26.69	1.20
ROA	3192	0.04	0.03	−1.72	2.06	0.10
MB	3192	2.03	1.57	0.54	43.85	1.79
Leverage	3192	0.57	0.50	0.01	61.34	1.40
Lsh	3192	35.96	34.50	3.64	83.74	14.98
Msh	3192	0.11	0.00	0.00	5.14	0.44
LnComp	3192	13.64	13.66	10.82	16.50	0.79
BoardSize	3192	9.25	9.00	4.00	18.00	1.81
NUM	3192	20.51	13.00	1.00	130.00	24.99
FirmAge	3192	8.38	9.00	0.00	20.00	4.63
	N	Value = 0	% for 0 (%)	Value = 1		% for 1 (%)
Panel B Descriptive statistics of discrete variables						
PTO	3192	2100	65.79	1092		34.21
CTO	3192	2112	66.17	1080		33.83
SOE	3192	1333	41.76	1859		58.24

where *Size* is the log value of total assets, *Revenue* is the log value of sales, and *RegionLevel* is the level of regional development. For detailed variable definitions please refer to Table 3.

We construct the province-level and city-level top official turnover variables, *PTO* and *CTO*, respectively. Considering the lag effect of turnover, *PTO* and *CTO* capture the turnover event in year $t-1$.

4.2. Descriptive statistics

Table 4 Panels A and B provide the descriptive statistics of the continuous and discrete variables in the regressions. The mean of *AbLnExpense* is 0.09 and the proportion of sample firms that experience province-level and city-level top official turnover is 34.21% and 33.83%, respectively. The percentage of SOEs in the sample is nearly 60% and the mean of the largest shareholder ownership is 35.96%. The largest number of listed firms in one city is 130, but approximately 21 is the average number of firms in a city.

4.3. Multivariate analysis

To test whether corporations increase political networking expenditures when the top local officials change, we construct the following model:

$$\begin{aligned} AbLnExpense = {} & \beta_0 + \beta_1 TurnOver + \beta_2 SOE + \beta_3 Lsh + \beta_4 Msh + \beta_5 BoardSize + \beta_6 LnComp + \beta_7 Size \\ & + \beta_8 ROA + \beta_9 MB + \beta_{10} Leverage + \beta_{11} FirmAge + \beta_{12} \mathrm{RegionLevel} + Industry + Year + \varepsilon \end{aligned} \quad (2)$$

where *AbLnExpense* is corporate political networking expenditure measured by the residual of model (1) and *TurnOver* represents *PTO* and/or *CTO*. The other control variables are defined in Table 3.

We chose an exogenous event, specifically top local official turnover, to test the validity of our corporate political socializing measure. As it is a validity test of our measure of political networking expenditure, we expect a significant positive β_1 in regression (2).

Previous studies use expense items as a proxy for management perks (Chen et al., 2005; Gul et al., 2011). Although there is no theoretical link between management perks and official turnover, we control for the factors that affect management perks in model (2). The main results are shown in Table 5. We report robust *t*-statistics based on standard errors adjusted for clustering at the firm level. In the first column, we put *PTO* in the regression and do not find a significant result. The results for *CTO* in the regression are shown in column (3). The significant positive coefficient of *CTO* means that the turnover of city-level top officials increases corporate expenditures on political networking. If both *PTO* and *CTO* are included in the regression

Table 5
Results of validity test (H1).

	(1) *AbLnExpense*	(2) *AbLnExpense*	(3) *AbLnExpense*	(4) *AbLnExpense*
PTO	−0.034			−0.032
	(−1.032)			(−0.991)
CTO		0.072**	0.063**	0.061**
		(2.118)	(2.440)	(2.301)
SOE	−0.077		−0.094*	−0.093*
	(−1.457)		(−1.828)	(−1.811)
Size	−0.049***		−0.053***	−0.053***
	(−2.711)		(−2.910)	(−2.898)
Lsh	−0.003**		−0.003	−0.003
	(−1.973)		(−1.634)	(−1.632)
ROA	0.308*		0.407**	0.405**
	(1.883)		(2.519)	(2.506)
MB	0.085***		0.065***	0.065***
	(5.665)		(4.877)	(4.896)
Leverage	−0.027***		−0.017**	−0.018**
	(−3.302)		(−2.074)	(−2.082)
Msh	0.059		0.031	0.031
	(1.271)		(0.675)	(0.685)
LnComp	0.263***		0.275***	0.274***
	(7.745)		(8.229)	(8.200)
BoardSize	0.012		0.010	0.010
	(0.971)		(0.892)	(0.897)
RegionLevel	0.415***		0.399***	0.399***
	(12.233)		(12.114)	(12.119)
FirmAge	−0.017***		−0.012**	−0.012*
	(−2.797)		(−1.977)	(−1.941)
Industry	Controlled	Controlled	Controlled	Controlled
Year	Controlled	Controlled	Controlled	Controlled
Constant	−2.635***	0.087	−2.713***	−2.693***
	(−5.414)	(0.789)	(−5.611)	(−5.569)
Observations	3192	3192	3192	3192
F	22.088	24.999	24.966	24.109
Adj.R^2	0.259	0.107	0.300	0.300

Robust *t*-statistics are in parentheses.
* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

the results are consistent. In column (2), we regress *AbLnExpense* on *CTO* to show the explanatory power of city top official turnover on corporate political networking expenditure. The coefficient is positive and significant and the adjusted *R*-square is 0.107. The above results confirm the validity of our political networking expenditure measure.

The effect of corporate ownership type has been discussed broadly in China. Compared to SOEs, which have obvious political ties, non-SOEs have more incentives to establish political connections. We predict that non-SOEs react more aggressively when top local officials are replaced. We test the interaction effect of state ownership on the relationship of corporate political networking expenditure to top local official turnover by grouping the firms by ownership type. The results shown in Table 6 are consistent with our prediction. In the non-SOE group, corporate political networking expenditure increases significantly in response to city-level top official turnover, but the result disappears in the SOE group. This suggests that the systematic effect of local official turnover on the increase of corporate political socializing expenditure is dominated by non-SOEs, implying that non-SOEs tend to socialize with officials to create political connections when top officials are replaced. We also use the interaction method to re-check these results, and the results are confirmed.

Table 6
Results for ownership type (H2).

	(1) SOEs *AbLnExpense*	(2) Non-SOEs *AbLnExpense*	(3) Full sample *AbLnExpense*
PTO	−0.016	−0.031	−0.023
	(−0.369)	(−0.596)	(−0.673)
CTO	0.030	0.094**	0.078*
	(0.859)	(2.197)	(1.774)
SOE			−0.073
			(−1.264)
*CTO * SOE*			−0.063*
			(−1.716)
Size	−0.029	−0.069***	−0.048***
	(−1.133)	(−3.087)	(−2.627)
Lsh	−0.005**	−0.001	−0.004**
	(−2.295)	(−0.252)	(−2.224)
ROA	0.519	0.314*	0.289*
	(1.641)	(1.766)	(1.764)
MB	0.136***	0.047***	0.085***
	(5.511)	(3.707)	(5.738)
Leverage	0.024	−0.016*	−0.026***
	(0.167)	(−1.776)	(−3.064)
Msh	−0.583	0.002	0.300
	(−1.527)	(0.048)	(1.590)
LnComp	0.296***	0.220***	0.259***
	(6.725)	(4.438)	(7.533)
BoardSize	0.015	0.009	0.009
	(1.026)	(0.420)	(0.680)
RegionLevel	0.406***	0.413***	0.418***
	(9.189)	(8.662)	(12.147)
FirmAge	−0.012	−0.018*	−0.013**
	(−1.482)	(−1.859)	(−2.063)
Industry	Controlled	Controlled	Controlled
Year	Controlled	Controlled	Controlled
Constant	−3.647***	−1.574**	−2.589***
	(−5.940)	(−2.307)	(−5.458)
Observations	1859	1333	3192
F	13.474	18.201	19.873
Adj.R^2	0.260	0.294	0.246

Robust *t*-statistics are in parentheses.
* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

We use the number of listed firms in a city as a city-level marketization index to test whether the level of regional marketization has an interaction effect on the relationship between top local official turnover and corporate political networking expenditures. Previous studies have shown that corporations are more likely to have political connections in regions with weak legal regimes, strong government intervention and lower marketization (Faccio, 2006; Yu and Pan, 2008). Therefore, we predict that corporations located in regions with low levels of marketization will socialize with officials more actively when top officials are replaced. To test this hypothesis, we add the interaction term of the local marketization index (*NUM*) and city-level top official turnover (*CTO*) to the main regression.

The results summarized in Table 7 show that the coefficient of the interaction term of the local marketization index (*NUM*) and city-level top official turnover (*CTO*) is significantly negative, indicating that high levels of marketization diminish the sensitivity of political networking expenditure to top local official turnover. Consistent with previous studies, we thus provide new evidence that political connections are pursued

Table 7
Results for levels of regional marketization (H3).

	(1) *AbLnExpense*	(2) *AbLnExpense*	(3) *AbLnExpense*
PTO	−0.025	−0.028	−0.027
	(−0.797)	(−0.894)	(−0.829)
CTO	0.160***	0.101***	0.068*
	(2.713)	(2.966)	(1.809)
NUM	0.001		
	(0.477)		
*NUM * CTO*	−0.002**		
	(−2.099)		
NUM_1		0.037	
		(1.395)	
*NUM_1 * CTO*		−0.041*	
		(−1.842)	
MktIndx			0.006
			(0.504)
*MktIndx * CTO*			−0.005
			(−0.422)
SOE	−0.101**	−0.103**	−0.091*
	(−1.966)	(−2.006)	(−1.712)
Size	−0.035*	−0.036*	−0.053***
	(−1.774)	(−1.818)	(−2.944)
Lsh	−0.003	−0.003	−0.003
	(−1.646)	(−1.629)	(−1.532)
ROA	0.432***	0.433***	0.411**
	(2.644)	(2.640)	(2.537)
MB	0.069***	0.068***	0.063***
	(4.894)	(4.846)	(4.817)
Leverage	−0.026	−0.026	−0.017*
	(−1.493)	(−1.455)	(−1.930)
Msh	0.040	0.044	0.135
	(0.885)	(0.997)	(0.741)
LnComp	0.222***	0.225***	0.279***
	(6.445)	(6.508)	(8.293)
BoardSize	0.005	0.006	0.009
	(0.461)	(0.481)	(0.736)
RegionLevel	0.394***	0.417***	0.403***
	(9.997)	(10.012)	(12.138)
FirmAge	−0.011*	−0.011*	−0.011*
	(−1.856)	(−1.891)	(−1.726)
Industry	Controlled	Controlled	Controlled
Year	Controlled	Controlled	Controlled
Constant	−2.314***	−2.262***	−2.660***
	(−4.717)	(−4.623)	(−5.486)
Observations	3192	3192	3192
F	21.431	21.540	22.462
Adj.R²	0.295	0.295	0.299

aggressively in regions with lower market orientations. We re-check this result using a ranked variable of the number of city-listed firms *(NUM_1)* and the result is consistent. However, the result disappears if we use the Fan-Wang marketization index instead of our *NUM* index, perhaps because the Fan-Wang index is a province-level index that does not reflect the variation between cities.

4.4. Additional tests

In the recent years, the value of political connections to corporations has been explored around the world (see, Fisman, 2001; Faccio et al., 2006; Goldman et al., 2009; Wu et al., 2010). Using our new measure of

Table 8
Economic consequences of political networking expenditures.

	(1) OLS *ROA*	(2) OLS *Tobin's Q*
AbLnExpense	0.011***	0.254***
	(5.225)	(5.275)
SOE	−0.013***	−0.080
	(−2.903)	(−1.228)
Size	0.015***	−0.369***
	(7.015)	(−6.519)
Lsh	0.000**	−0.005**
	(2.135)	(−2.224)
MB	0.012***	
	(2.663)	
Leverage	−0.017***	0.373***
	(−2.820)	(7.547)
Msh	0.020***	−0.851***
	(5.506)	(−3.466)
RegionLevel	−0.004	−0.008
	(−1.399)	(−0.151)
Region	Controlled	Controlled
Industry	Controlled	Controlled
Year	Controlled	Controlled
Constant	−0.279***	9.872***
	(−5.733)	(7.946)
Observations	3192	3192
F	13.171	39.035
Adj. R^2	0.143	0.354

Robust *t*-statistics are in parentheses.
* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

political connections, we examine the economic consequences of the political ties created through social intercourse.

We use return on total assets (*ROAt*) to measure accounting performance in year *t*. In column (1) of Table 8, the coefficient of *AbLnExpense* is significantly positive, indicating that political ties formed through social intercourse could improve firm performance. We also examine the effect of such political ties on firm valuation, which is proxied for by *Tobin's Q;* the result is similar. Consistent with previous studies, we find that political connections obtained through social intercourse can increase corporate value.

We also conduct several robustness tests. First, we exclude all of the observations from 2007 as the 17th National Congress of the Communist Party of China was convened that year and thus the number of provinces that experienced top official turnover is extremely high for that year. Second, we rule out the alternative explanation that increased expenditures may be caused by increased corporate investment after top local officials are replaced. Julio and Yook (2012) find that firms reduce investments during election years. Other researchers have argued that firms may increase investments after politicians are replaced and expenses may increase correspondingly. To test this, we additionally control for corporate investment in our model and the results remain the same. Following Xin et al. (2007), we define investment as the log value of the change in net PP&E, long-term investment, and intangible assets. We do not find a positive relationship between our measure of expenditures on political social intercourse (*AbLnExpense*) and corporate investment; therefore, we rule out the investment explanation.

Third, we use the IV-2SLS method to re-test the relationship between firm performance and corporate political networking expenditures. There may be an endogeneity issue in the analysis of the association between firm performance and corporate political socializing expenditure, as high-performing firms tend to

Table 9
Results of IV-2SLS regressions.

	(1) 2SLS Second step *ROA*	First step *AbLnExpense*	(2) 2SLS Second step *Tobin's Q*	First step *AbLnExpense*
AbLnExpense	0.012*		0.797*	
	(1.896)		(1.661)	
LnAvgSalry		0.252**		0.474***
		(2.034)		(2.599)
SOE	−0.009	−0.105*	−0.002	−0.140**
	(−1.455)	(−1.869)	(−0.016)	(−2.565)
Size	0.014***	0.017	−0.364***	−0.010
	(4.961)	(0.986)	(−6.349)	(−0.579)
Lsh	0.000*	−0.003*	−0.003	−0.004**
	(1.917)	(−1.652)	(−1.046)	(−2.269)
MB	0.010*	0.086***		
	(1.727)	(5.416)		
Leverage	−0.015***	−0.040***	0.375***	−0.003
	(−3.386)	(−4.077)	(7.568)	(−0.660)
Msh	0.056**	0.086***	−1.036***	0.316*
	(2.377)	(5.416)	(−3.738)	(1.678)
RegionLevel	−0.011	0.411***	−0.263	0.405***
	(−0.774)	(9.434)	(−1.123)	(8.227)
Region	Controlled	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled	Controlled
Year	Controlled	Controlled	Controlled	Controlled
Constant	−0.093**	−3.071**	9.814***	−4.864**
	(−1.988)	(−2.429)	(7.845)	(−2.498)
Observations	3192	3192	3192	3192
F	15.208	20.414	39.439	19.458
Adj. R^2	0.129	0.211	0.341	0.246

Robust *t*-statistics are in parentheses.
* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

have higher socializing expenditures. We choose an instrumental variable for corporate political networking expenditure to diminish the endogeneity problem. The IV we use is the average regional salary. We think that the average regional salary, to a certain extent, reflects regional consumption levels, and that the local corporate social expenses should reflect the local level of consumption. However, there is no theoretical link between firm performance or valuation and average regional salary. The results of the 2SLS are shown in Table 9 and are consistent with the OLS results. They confirm that corporate expenditures on political networking are a new measure of corporate political connections and that increased amounts of political networking increase firm value.

5. Conclusions

In this study of corporate political connections, we document that socializing with government officials is a common and important political strategy used by Chinese firms. We capture political connections using a new measure based on corporate socializing expenditures. Several interesting findings emerge from our analysis. First, we test the validity of the new measure using exogenous events, specifically the turnover of top local officials, which results in the breaking of corporate political ties. We find that corporate expenditures on political networking increase significantly when top local officials are replaced and this effect is stronger for non-SOEs, who seek political connections more aggressively. Second, this study shows that firms in regions with low levels of marketization react more aggressively to the turnover of local politicians, which confirms

previous findings that political connections are more important when the institutional environment is poor. We also find that corporate expenditures on socializing with officials have a positive effect on corporate performance and valuation, which suggests that socializing expenditures perform well as a new measure of corporate political connections and confirms the valuation effect of corporate political connections.

Acknowledgments

The authors would like to thank Qiang Cheng, Minghai Wei, Jinsong Tan, Chaopeng Wu (our discussant at CJAR special issue conference, March 2013), Bingxuan Lin and participants of the CJAR special issue conference. We also thank Haibo Wang for his excellent research assistance. All errors remain our own.

References

Adhikari, A., Derashid, C., Zhang, H., 2006. Public policy, political connections, and effective tax rates: longitudinal evidence from Malaysia. J. Account. Public Policy 25 (5), 574–595.

Allen, F., Qian, J., Qian, M.J., 2005. Law, finance and economic growth in China. J. Financ. Econ. 77, 57–116.

Bai, C.E., Lu, J., Tao, J., 2006. Property rights protection and access to bank loans: evidence from private enterprises in China. Econ. Transit. 14, 611–628 (in Chinese).

Cai, H.B., Fang, H.M., Xu, L.X., 2011. Eat, drink, firms, government: an investigation of corruption from the entertainment and travel costs of Chinese firms. J. Law Econ. 54, 55–77.

Chen, D., 2003. Local government, corporate governance and government subsidies: evidence from China. Study Finan. Econ. 9, 15–21 (in Chinese).

Chen, D., Chen, X., Wan, H., 2005. Regulation and non-pecuniary compensation in chinese SOEs. Econ. Res. J. 2, 92–101 (in Chinese).

Chen, C.J.P., Ding, Y., Kim, C.F., 2010. High-level politically connected firms, corruption, and analyst forecast accuracy around the world. J. Int. Bus. Stud. 41, 1505–1524.

Chen, H., Parsley, D.C., Yang, Y., 2009. Corporate Lobbying and Financial Performance. Unpublished working paper. University of Colorado at Boulder, Vanderbilt University, and Wake Forest University.

Claessens, S., Feijen, E., Laeven, L., 2008. Political connections and preferential access to finance: the role of campaign contributions. J. Financ. Econ. 88 (3), 554–580.

Cooper, M.J., Gulen, H., Ovtchinnikov, A.V., 2010. Corporate political contributions and stock returns. J. Finan. 65 (2), 687–724.

Faccio, M., 2006. Politically connected firms. Am. Econ. Rev. 96, 369–386.

Faccio, M., Masulis, R.W., McConnell, J.J., 2006. Political connections and corporate bailouts. J. Finan. 61 (6), 2597–2635.

Fisman, R., 2001. Estimating the value of political connections. Am. Econ. Rev. 91 (4), 1095–1102.

Goldman, E., Rocholl, J., So, J., 2008. Political Connections and the Allocation of Procurement Contracts. Unpublished working paper. Indiana University, University of North Carolina at Chapel Hill, and ESMT European School of Management and Technology.

Goldman, E., Rocholl, J., So, J., 2009. Do politically connected boards affect firm value? Rev. Financ. Stud. 22, 2331–2360.

Gul, F.A., Cheng, L.T.W., Leung, T.Y., 2011. Perks and the informativeness of stock prices in the Chinese market. J. Corporate Finan. 17, 1410–1429.

Johnson, S., Mitton, T., 2003. Cronyism and capital controls: evidence from Malaysia. J. Financ. Econ. 67, 351–382.

Julio, B., Yook, Y., 2012. Political uncertainty and corporate investment cycles. J. Finan. 67 (1), 45–83.

Hill, M.D., Kelly, G.W., Van Ness, R.A., 2009. Determinants and Effects of Corporate Lobbying. Unpublished working paper. University of Mississippi, Mississippi State University, and University of Nevraska–Lincoln.

Hu, X., 2006. Political background of private entrepreneurs and financing facilitations of private firms: Evidence from the largest 100 private firms in Zhejiang Province. Manage. World 5 (107–113), 141 (in Chinese).

Leuz, C., Oberholzer-Gee, F., 2006. Political relationships, global financing, and corporate transparency: evidence from Indonesia. J. Financ. Econ. 81 (2), 411–439.

Li, H., Meng, L., Zhang, J., 2006. Why do entrepreneurs enter politics? Evidence from China. Econ. Inq. 44, 559–578.

Lian, J., Liu, X., Yang, J., 2011. Political connections, bank loans and firm value. Nankai Bus. Rev. 5, 48–57 (in Chinese).

Luo, D., Liu, X., 2009. Political connections and barriers to entry and firm performance. Manage. World 5, 97–106 (in Chinese).

Luo, D., Ying, Q., 2012. Political connection, official inspection and firm performance: the empirical evidences come from Chinese manufacturing listed companies. Nankai Bus. Rev. 5, 78–84 (in Chinese).

Luo, D., Zhen, L., 2008. Private control, political relationship and financing constrain of private listed enterprises. J. Financ. Res. 12, 164–178 (in Chinese).

Niessen, A., Ruenzi, S., 2010. Political connectedness and firm performance: evidence from Germany. German Econ. Rev. 86, 87–105.

Pan, Y., Dai, Y., Li, C., 2009. Political connections and government subsidies of companies in financial distress: empirical evidence from Chinese ST listed companies. Nankai Bus. Rev. 5, 6–17 (in Chinese).

Wu, W., Wu, C., Rui, O.M., 2010. Ownership and the value of political connections: evidence from China. Eur. Financ. Manage. 18 (4), 695–729.

Xin, Q., Lin, B., Wang, Y., 2007. Government control, manager compensation and corporate investment. Econ. Res. J. 8, 110–122.

Yu, M., Hu, Y., Pan, H., 2010. Political connections, rent seeking, and the fiscal subsidy efficiency of local governments. Econ. Res. J. 3, 65–77 (in Chinese).

Yu, M., Pan, H., 2008. The relationship between politics, institutional environments and private enterprises' access to bank loans. Manage. World 8, 9–21 (in Chinese).

Zhang, J., Zhang, Z., 2005. Political strategies of Chinese private entrepreneurs. Manage. World 7, 94–105 (in Chinese).

Zhang, M., Zhang, S., Wang, C., Shen, H., 2010. Political connections and allocative efficiency of credit resource. Manage. World 11, 143–153 (in Chinese).

China Journal of Accounting Research 8 (2015) 41–57

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Does media governance restrict corporate overinvestment behavior? Evidence from Chinese listed firms

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ARTICLE INFO

Article history:
Received 14 May 2013
Accepted 11 October 2014
Available online 18 November 2014

Keywords:
Media governance
Overinvestment
Governance efficiency

ABSTRACT

Using China's A-share listed firms from 2007 to 2011, this paper empirically tests how media governance affects firms' levels of overinvestment and whether external supervision and informal institutional mechanisms reduce these levels. We find that media governance and overinvestment are significantly negatively related. When firms are located in a district with a stronger media governance environment their levels of overinvestment are lower, indicating that media governance significantly restricts overinvestment behavior. When internal corporate governance efficiency is low, the negative relationship between the media environment and overinvestment behavior is significantly enhanced, indicating that when internal governance or formal systems have reduced efficacy, an important complementary role is played by external supervision and the informal institutional environment. After considering endogeneity and different measures of overinvestment and other related variables, the conclusions remain unchanged.

1. Introduction

In the recent years, overinvestment has become an important problem in China's macro- and micro-economic development. For example, a report released by Li, China's chief representative to the International Monetary Fund (IMF), on April 15, 2013 stated that the level of overinvestment in China was 12–20% above

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http://dx.doi.org/10.1016/j.cjar.2014.10.001
1755-3091/

the equilibrium level as a share of GDP.[1] Academic research shows that serious problems are caused by inefficient investment by Chinese corporations (Tang et al., 2007) and that overinvestment by listed Chinese companies is relatively common (e.g., Li and Jiang, 2007; Wei and Liu, 2007; Jiang et al., 2009; Luo et al., 2012). Scholars have recently explored methods for managing overinvestment, mostly by focusing on the level of overinvestment by corporate or direct stakeholders. That is, recent studies on the governance of overinvestment have mostly been conducted from the internal corporate perspective and less attention has been paid to the role of informal institutional mechanisms, such as the external environment or external supervision. In China, a typical emerging market economy in transition, the formalization and implementation of the legal system is not perfect and certain informal institutions have an important role in managing firms' behavior (Allen et al., 2005; Chen et al., 2013).

Many recent studies have shown that the effects of media supervision on public opinion may effectively supplement internal corporate governance. In particular, given the high degree of information asymmetry in the capital market, the media acts as an information intermediary (Zavyalova et al., 2012). By collecting and disseminating information, the media develops an effective information environment and helps to reduce asymmetry between corporations and external investors. As a typical emerging market economy, China exhibits a wide disparity in the levels of media development in different areas (Yu, 2012), providing a useful setting for examining the supervisory function of the media governance environment on corporate behavior.

Based on China's A-share listed firms from 2007 to 2011, this paper empirically tests how media governance affects the level of overinvestment and whether external supervision and informal institutions can reduce overinvestment. We find that media governance and overinvestment are significantly negatively related. That is, if a district has a stronger media governance environment, corporations' levels of overinvestment are lower, suggesting that media governance significantly restricts overinvestment behavior. In addition, when corporate governance efficiency is low, the negative relationship between the media environment and overinvestment behavior is significantly enhanced, indicating that external supervision and the informal institutional environment play an important complementary role when internal governance or formal systems have reduced efficacy. After considering endogeneity and different measures of overinvestment and other related variables, the conclusions remain unchanged.

Our study makes three main contributions to the literature. First, it shows that the media governance environment can help to efficiently reduce the overinvestment levels of corporations, which enriches and expands the literature on the governance function of media supervision. Second, it explores how overinvestment behavior by corporations may be inhibited. Because previous studies on overinvestment governance have mostly focused on the design or restriction of overinvestment within corporations or by their direct stakeholders, little attention has been paid to supervisory roles outside the firm and to informal institutional mechanisms. Therefore, this paper further extends the literature in this field. Third, our study shows that when internal corporate governance fails, restrictions on overinvestment that are based on external supervision are significantly enhanced. In other words, when a formal system of internal governance fails, external oversight or informal institutional arrangements can have a significant supplementary role. This paper thus complements the literature that explores the corporate governance effects of informal institutions.

The remainder of the study is structured as follows. Section 2 provides a literature review and introduces the research hypotheses. Section 3 describes the sample and our research design. Section 4 presents and analyzes the empirical results. Section 5 provides some conclusions.

2. Literature review and research hypotheses

2.1. Literature review

2.1.1. Corporate overinvestment behavior

The previous academic literature mainly discusses the reasons for overinvestment from the principal-agent and asymmetric information perspectives. In terms of the principal-agent view, Jensen (1986) argues that the

[1] *Source:* http://finance.ifeng.com/news/macro/20130416/7909163.shtml.

most direct way for managers to achieve personal gain is to expand the size of their firms. Thus, a manager will try to make investments using a firm's free cash flow and may even invest in projects with a negative NPV to pursue the benefits of corporate expansion and construct a "corporate empire." From the asymmetric information perspective, information asymmetry between outside investors and internal corporate managers regarding firms' asset values and investment project earnings is widespread in China (Zhang and Lu, 2009). Insiders possess more information about the value of a company and are more likely to seize an opportunity to sell over-priced assets in the market. If the market fails to detect such overvaluations, then overinvestment occurs (e.g., Myers and Majluf, 1984; Heinkel and Zechner, 1990; Baker et al., 2003; Pan and Jin, 2003).

There has been much discussion about methods for regulating overinvestment. Most of the literature contemplates restricting overinvestment by strengthening supervision or constraining corporations' financial policies. For example, some studies suggest that the board of directors (e.g., Chung et al., 2003; Chen and Xie, 2011), institutional investors (e.g., Shleifer and Vishny, 1997; Ye et al., 2012), the controlling shareholder (Tang et al., 2007; Yu et al., 2010) or other supervisory parties can significantly reduce overinvestment by corporations. Other studies show that strengthening internal controls (Cheng et al., 2013), raising levels of debt (e.g., Huang and Shen, 2009), distributing cash dividends (e.g., Tang, 2007; Wei and Liu, 2007) or other internal financial policy constraints can help to improve the efficiency of corporate investments.

2.1.2. Governance efficiency of media supervision

The media can play an important role in encouraging public participation in corporate supervision. Media supervision can effectively supplement traditional methods of governance by greatly reducing the costs incurred by stakeholders in searching for information, and may thereby indirectly provide effective supervision (Zhang, 2009). Public review via media communications can be an important mechanism for the social supervision of corporate governance (Craven and Marston, 1997; Li and Shen, 2010). In general, the media does not own stakes in listed companies or exercise direct control over them, but it can influence some users of the information it provides to play a role in corporate governance (Yang and Zhao, 2012). The media's role in corporate governance has been verified in many studies (Besley and Prat, 2002; Miller, 2006; Dyck et al., 2008; Joe et al., 2009; Xu and Xin, 2011; Yang and Zhao, 2012). For example, Gillan (2006) notes in a literature review related to corporate governance that the media is equal to the law in its importance as an external governance mechanism. Joe et al. (2009) examine the worst boards of directors in the United States as published by *Business Weekly* in 1996, 1997 and 2000 and find that media reports that are critical of such boards lead them to attempt to improve their efficiency, exemplifying the media's role in governance. Xu and Xin (2011) argue that the media played an important role in governance during the Split Share Structure Reform, while Yang and Zhao (2012) find that the media has a supervisory function in setting executive pay rates in listed companies.

There are also attempts in the literature to explain how the media plays a supervisory role in corporate governance. Zhang (2009) argues that it is difficult to obtain all of the necessary information and knowledge about companies because of the high costs of information searching. Instead, investors are only able to obtain certain information and remain ignorant about other aspects. Media reports can greatly reduce the cost of investors' access to information and make the information they receive more complete, which helps stakeholders to effectively supervise a corporation and make rational investment decisions. Yan (2008) argues that the media supervision of firms affects three aspects of corporate governance: companies' internal governance structures, the internal and external governance mechanisms of various stakeholders, and external supervision. Li and Xiong (2012) note that the media mainly provides supervision through the dissemination of information. Through information intermediaries, the media can achieve the desired effect of expanding the amount of information available and can then affect the audience's understanding of that information, or it can change the conditions for the distribution of information. Thus, the media can effectively reduce the information asymmetry problem whenever a contract is signed and implemented. Compared with legal and regulatory supervision, which have shortcomings such as high costs, a heavy burden of proof and delayed implementation, the media has the advantage of early intervention and low costs relating to corporate supervision.

2.2. Research hypotheses

To a certain extent, media supervision can solve both the "principal-agent" and "information asymmetry" problems.

In terms of the "principal-agent" problem, the media can help to expose listed firms supervised by related parties via the dissemination of information, information manufacturing and other functions. It can effectively restrain managers' opportunistic behavior and reduce the incidence of agency problems (Yu et al., 2011). Scholars outside China have confirmed that the reputation mechanism can significantly restrict manager behavior (e.g., Fama and Jensen, 1983; Dyck et al., 2008). Although many Chinese scholars do not consider a manager reputation mechanism to be active in China, Zheng et al. (2011) use IPO data from the Shanghai and Shenzhen stock markets to show that negative media reports cause ordinary people to pay attention to companies, which constitutes an external constraint on the behavior of managers who care about their firms' reputation. Liang et al. (2012) note that media supervision reduces corporate agency costs by activating internal corporate governance mechanisms. After negative reports in the media, a firm's stakeholders tend to believe that the firm's problems may be even more serious than portrayed and will therefore take active measures to safeguard their own interests and improve efficiency (Yao et al., 2011).

In terms of "information asymmetry," Owen (2002) argues that the media is a very important information intermediary institution in modern economic life and a potential channel for reducing information asymmetry. The media can increase market efficiency by reducing the degree of information asymmetry among investors so that information can affect stock prices more quickly (Li and Xiong, 2012). The media can be seen as an alternative mechanism for disclosure of information relating to listed companies and media coverage can reduce the degree of information asymmetry in capital markets (Zhang and Liu, 2011). Yan (2008) demonstrates that the media plays an important role in reducing information asymmetry from the four perspectives of manufacturing information, the auxiliary processing of information disclosure and re-disclosure, disseminating information, and guiding public opinion.

Based on the foregoing analysis of the important role played by media governance in reducing information asymmetry and solving the principal–agent problem, improvements to the media supervision environment should effectively decrease corporations' overinvestment levels. The media can supervise and govern corporate behavior through the reputation mechanism or by encouraging the involvement of administrative agencies. To preserve firm reputation or due to pressure from the market, managers will forgo short-sighted and opportunistic behavior and work to improve decision-making efficiency, thereby reducing agency costs. Additionally, improvements to the media governance environment can reduce the cost of information transmission, allowing market participants to obtain the relevant information to effectively supervise managers and to increase the costs and risks of managers not obeying the law or acting contrary to the will of shareholders. Thus, the media can act as an implicit constraint mechanism and reduce agency costs.

Based on the important role that media governance plays in solving the "principal–agent" and "information asymmetry" problems described above, we propose our first research hypothesis:

H1. The level of media governance in the region where a firm is located is significantly negatively related to the level of corporate overinvestment in that region.

Corporate supervision by the media and the public is effective in eliminating corruption caused by too much power and a lack of constraints, making it an important supplement to corporate governance mechanisms (Xu and Xin, 2011). When a firm's internal management efficiency is low or its formal internal governance system is not effective, informal institutional mechanisms derived from external public supervision can play a more pronounced role.

Thus, we propose our second research hypothesis:

H2. When internal corporate governance efficiency is low, the negative relationship between the level of media governance and the degree of corporate overinvestment is significantly enhanced.

3. Research design and sample selection

3.1. Research design

3.1.1. Overinvestment estimation

Overinvestment (*Overinv*) represents the extent of corporate investment beyond a reasonable level and is measured as the amount by which the actual corporate investment level deviates from a normal level, where the portion that is greater than the normal level is defined as overinvestment.

We follow the framework of Richardson (2006) to estimate the normal level of investment. In constructing the model, we consider not only the influence of investment opportunities (*Growth*) but also the scale of the firm (*Asset*), its level of debt (*Level*), its market performance (*Ret*), the number of years the firm has been listed (*Age*), the level of cash holdings (*Cash*) and other control variables. The effects of time (*Year*) and industry (*Industry*) are also controlled for. In addition, because firms' investments in projects are often assigned to more than one accounting period, we include the lag of investments. The specific calculations and definitions of the variables are shown in Table 1. Yu et al. (2010), Tang et al. (2010) and Luo et al. (2012) use a similar approach.

We construct a model for estimating the normal level of investment as follows:

$$Inv_{i,t} = \alpha_0 + \beta_1 Asset_{i,t-1} + \beta_2 Lev_{i,t-1} + \beta_3 Growth_{i,t-1} + \beta_4 \mathrm{Ret}_{i,t} + \beta_5 Age_{i,t} + \beta_6 Cash_{i,t-1} + \beta_7 Inv_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

Table 1
Variable definitions.

Variable name	Definition	Calculation
Asset	Asset scale	Natural logarithm of total assets
Lev	Leverage level	Total liabilities/total assets
Growth1	Growth1	Sales growth
Growth2	Growth2	Tobin's *Q* value, the ratio of market value to book value
Ret	Market return	Cumulative return rate from May in year *t* to April in year *t* + 1
Age	Number of years listed	The number of years between the latest annual financial report and the firm's IPO
Cash	Cash holdings	(Cash + short-term investments or tradable financial assets)/total assets
Inv1	Investment 1	(Cash for buying fixed assets, intangible assets and other long-term assets – net cash for disposing of recovered fixed assets, intangible assets and other long-term assets)/total assets
Inv2	Investment 2	{Long-term assets at the end of the year – long-term assets at the beginning of the year)/total assets at the beginning of the year
Overinv1	Overinvestment 1	Overinvestment estimated using *Inv1* and *Growth1*
Overinv2	Overinvestment 2	Overinvestment estimated using *Inv1* and *Growth2*
Overinv3	Overinvestment 3	Overinvestment estimated using *Inv2* and *Growth1*
Media	Media governance	The *Chinese Media Development Index Report* by Guoming Yu measures the degree of regional media supervision. For the missing index for 2011, we adopt an OLS trend prediction
HHI5	Equity concentration	The sum of the squares of the top five shareholders' shareholding ratios
Magstk	Management shareholdings	Managerial stockholding ratio
Duality	Chairman and general manager combined	Whether the chairman and CEO roles are assumed by the same person; equals 1 if yes, and 0 otherwise
Boardsize	The size of the board of directors	Number of directors on the board
Idr	Ratio of independent directors	Proportion of independent directors on the board of directors
Fcf	Free cash flow	Natural logarithm of cash flow from operations less capital expenditure
Otac	Large shareholder governance	Other receivables/total assets
SOE	Nature of property rights	Equals 1 for state-owned corporations, and 0 otherwise
EM	Earnings management	Absolute value of manipulated accrual level; equals 1 if the value is higher than the median, and 0 otherwise

For the sake of robustness, based on Model (1) we define the normal investment level in three ways and obtain three estimates of overinvestment.

1. Using *Inv1* as a proxy for the level of actual investment and sales growth (*Growth1*) as a proxy for corporate investment opportunities, we obtain the residual value *Overinv1* as the level of overinvestment. Wang (2009) uses this estimation method.
2. Using *Inv1* as a proxy for the level of actual investment and the Tobin's Q value (*Growth2*) as a proxy for corporate investment opportunities, we obtain the residual value *Overinv2* as the level of overinvestment. Zhong et al. (2010) use this estimation method.
3. Using *Inv2* as a proxy for the level of actual investment and sales growth (*Growth1*) as a proxy for corporate investment opportunities, we obtain the residual value *Overinv3* as the level of overinvestment. Yang and Hu (2007) use this estimation method.

3.1.2. Research model

To test Hypothesis 1, we establish the following research model:

$$Overinv = \alpha_0 + \beta_1 Media + \beta_2 HHI5 + \beta_3 Magtsk + \beta_4 Duality + \beta_5 Boardsize + \beta_6 Idr + \beta_7 Fcf + \beta_8 Lev + \beta_9 Otac + \sum Year + \sum Ind + \varepsilon_{i,t} \quad (2)$$

In this model, the dependent variable is the corporation's overinvestment level, which we estimate from Model (1). The media governance variable (*Media*) is measured from the *Chinese Media Development Index Report* (2008–2012), which systematically evaluates media development in China and, for the first time, quantitatively examines its supervisory ability. The report also establishes the Chinese Media Development Index (CMDI), which depicts the regional media environment in China theoretically. The greater the value of the CMDI, the stronger the media supervision in that region (He and Wei, 2012; Wu et al., 2012). Because of a lack of data for 2011, we use the 2007–2010 data to predict an OLS trend for the 2011 media governance variable (*Media*). Following Tang et al. (2010) and Luo et al. (2012), we control for the corporate governance variables of equity concentration level (*HHI5*), the proportion of management shareholdings (*Magstk*), whether the chairman is also the CEO (*Duality*), the size of the board of directors (Boardsize) and the proportion of independent directors on the board of directors (*Idr*). In addition, because studies show that free cash flow (*Fcf*) (Jensen, 1986; Fazzari et al., 1988), debt ratio (*Lev*) (Huang and Shen, 2009; Zhang and Wang, 2010) and tunneling by controlling shareholders (*Otac*) (Luo et al., 2008) are important factors that influence overinvestment, we also control for these variables. Based on Hypothesis 1, we forecast the sign of β1 in Model (2) to be significantly negative.

We also test Hypothesis 2, that is, whether media governance influences overinvestment differently when corporate internal governance efficiency is low. Based on Model (2), we use interaction terms for internal governance efficiency and media governance in Model (3). To a certain extent, a company's degree of earnings management can be used as ex-post evidence of internal governance efficiency.

Following relevant research, such as that of Chen et al. (2013), we use the degree of earnings management as a proxy for internal governance efficiency. We estimate the level of a firm's non-discretionary accruals by using the cross-sectional modified Jones model. Discretionary accruals are represented by regression residuals. We adopt the absolute value of the residuals as a proxy for the degree of earnings management (EM). To avoid collinearity issues, we group EM by its median; thus, firms with values higher than the median are set to 1, and to 0 otherwise.

$$Overinv = \alpha_0 + \beta_1 Media + \beta_2 EM * Media + \beta_3 EM + \beta_4 HHI5 + \beta_5 Magtsk + \beta_6 Duality + \beta_7 Boardsize + \beta_8 Idr + \beta_9 Fcf + \beta_{10} Lev + \beta_{11} Otac + \sum Year + \sum Ind + \varepsilon_{i,t} \quad (3)$$

Table 2
Descriptive statistics for the main variables.

Variable	Mean	Minimum	P25	Median	P75	Maximum	Standard deviation
Asset	21.551	18.367	20.692	21.420	22.275	25.388	1.289
Lev	0.496	0.040	0.306	0.484	0.641	2.186	0.300
Growth1	0.270	−0.786	0.001	0.155	0.340	6.056	0.771
Growth2	2.062	0.825	1.219	1.589	2.273	11.309	1.553
Ret	−0.087	−0.989	−0.398	−0.113	0.233	1.600	0.552
Age	9.325	1	4	10	14	19	5.405
Cash	0.212	0.004	0.090	0.159	0.283	0.791	0.174
Inv1	0.057	−0.069	0.014	0.041	0.085	0.271	0.060
Inv2	0.065	−0.286	−0.004	0.039	0.111	0.655	0.134
Media	62.439	33.270	53.530	62.080	73.540	81.090	10.976
HHI5	0.172	0.013	0.076	0.145	0.245	0.567	0.121
Magstk	0.074	0.000	0.000	0.000	0.003	0.692	0.172
Duality	0.794	0	1	1	1	1	0.405
Boardsize	9.072	5	8	9	9	15	1.824
Idr	0.365	0.273	0.333	0.333	0.385	0.571	0.051
Fcf	19.019	14.387	18.042	18.993	19.984	23.311	1.610
Otac	0.023	0	0.004	0.010	0.024	0.228	0.037
SOE	0.508	0	0	1	1	1	0.500

3.2. Sample data

The sample comprises A-share listed companies in the Shanghai and Shenzhen stock markets from 2007 to 2011. Financial data for these companies are derived from the CSMAR database. Media governance data are derived from the *Chinese Media Development Index Report* (2008–2012)[2] and the industry classifications are from the *Industry Classification Guidance of Listed Companies* published by the China Securities Regulatory Commission (CSRC). Consistent with similar studies, we remove (1) firms in the financial industry and (2) abnormal observation values from the sample, and obtain a sample of 9191 observations. Additionally, to eliminate the influence of extreme values, we winsorize the continuous variables with extreme values in the intervals of 0–1% and 99–100%. We also carry out accuracy checks on all of the data and adjust the estimations for heteroskedasticity.

4. Empirical tests and analysis of results

4.1. Descriptive statistics

Table 2 gives the descriptive statistics for the main variables. We rule out the influence of outliers through winsorization. The maximum value for the media governance variable (*Media*) is 81.090 while the minimum is only 33.270. Thus, there are large differences between the media governance levels in different regions, which further indicates the significance of this study.

We divide our sample into two groups according to whether the level of media governance (*Media*) for the region in which each firm is located is greater than the median level.[3] We test the mean levels of overinvestment for the two groups via the indices *Overinv1*, *Overinv2* and *Overinv3*. The results are shown in Table 3.

We can see from Table 3 that the mean level of overinvestment for the high media governance group is significantly lower than that of the low media governance group in all three columns. These results statistically

[2] The index covers five types of indicators: the media product index, the media profit index, the audience consumption index, the competitive advertisement index and the media environment index. The index covers mass media, social media and academic journals through the dimensions of attention and influence. It objectively measures the media development index for 31 provinces, municipalities and autonomous regions in China.

[3] We eliminate those observations that are equal to the median, and use the same approach in Table 3.

Table 3
Results of t-tests for overinvestment under different levels of media governance.

Year	Media governance level	Overinv1		Overinv2		Overinv3	
		Mean	T value	Mean	T value	Mean	T value
2007	High	−0.0046	−2.65***	−0.0057	−2.07**	−0.0130	−3.14***
	Low	0.0035		0.0010		−0.0026	
2008	High	−0.0034	−2.58***	−0.0069	−2.33**	−0.0137	−4.02***
	Low	0.0048		0.0015		0.0016	
2009	High	−0.0095	−3.31***	−0.0080	−3.95***	−0.0184	−4.52***
	Low	0.0002		0.0045		−0.0035	
2010	High	−0.0001	−2.37**	−0.0059	−4.30***	−0.0172	−5.22***
	Low	0.0073		0.0080		0.0008	
2011	High	−0.0003	−2.17**	−0.0027	−3.34***	−0.0158	−4.01***
	Low	0.0078		0.0107		0.0025	
Total sample	High	−0.0030	−5.30***	−0.0046	−6.22***	−0.0151	−8.94***
	Low	0.0046		0.0051		−0.0003	

Notes: * $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

support the hypothesis that the level of media governance is negatively related to the degree of corporate overinvestment for all of the years from 2007 to 2011, which is consistent with Hypothesis 1.

4.2. Estimation of normal investment levels

Table 4 reports the estimations of the normal levels of investment. For each of the three estimation methods, corporate scale (*Asset*), investment opportunities (*Growth*), market performance (*Ret*), firms' cash holding levels (*Cash*) and lagged levels of investment ($Inv_{i,t-1}$) are significantly positively related to the firms' levels of corporate investment, while debt levels (*Level*) and listed years (*Age*) are significantly negatively related to corporate investment levels. These results are consistent with our expectations and with the results of similar studies (e.g., Yu et al., 2010; Tang et al., 2010; Luo et al., 2012).

4.3. Empirical results for Hypothesis 1

Table 5 reports the results of the regression analysis of media governance using the different overinvestment variables (*Overinv1*, *Overinv2*, and *Overinv3*).

We can see from columns 1, 3 and 5 of Table 5 that, after controlling for year and industry effects, media governance (*Media*) and overinvestment (*Overinv*) are significantly negatively related at the 1% level. We add other control variables, the results of which are shown in columns 2, 4 and 6 of Table 5, and find that the results are still significant. Thus, Hypothesis 1 is confirmed. In addition, the regression coefficient for *Fcf* is positive. That is, the greater the free cash flow in a firm, the higher the overinvestment level, indicating significant overinvestment behavior for high levels of free cash flow within listed companies in China. The results are consistent for all three estimation modes (*Overinv1*, *Overinv2* and *Overinv3*).

We also explore whether there is a significant difference between state-owned and non-state-owned listed companies. Table 6 reports the results of the regression analysis using *Overinv1* as the dependent variable.[4] We find that for both types of company, the coefficients for media governance (*Media*) are significantly negative. We re-test these results using the interaction variable *Media*SOE* and give the results in the third

[4] This conclusion is also consistent using Overinv2 and Overinv3 as the dependent variables. These results are also consistent for the tests that follow.

Table 4
Results of the estimation of normal investment levels.

Variable	Overinv1	Overinv2	Overinv3
$Asset_{i,t-1}$	0.00313***	0.00406***	0.00995***
	(0.00053)	(0.00055)	(0.00139)
$Lev_{i,t-1}$	−0.00860***	−0.00985***	−0.03657***
	(0.00181)	(0.00181)	(0.00576)
$Growth1_{i,t-1}$	0.00165**		0.00658***
	(0.00084)		(0.00255)
$Growth2_{i,t-1}$		0.00181***	
		(0.00048)	
$Ret_{i,t-1}$	0.00444***	0.00211***	0.01792***
	(0.00099)	(0.00053)	(0.00315)
$Age_{i,t-1}$	−0.00083***	−0.00086***	−0.00259***
	(0.00015)	(0.00014)	(0.00038)
$Cash_{i,t-1}$	0.04057***	0.04245***	0.09911***
	(0.00519)	(0.00507)	(0.01347)
$Inv1_{i,t-1}$	0.49392***	0.49447***	
	(0.01404)	(0.01398)	
$Inv2_{i,t-1}$			0.13462***
			(0.01735)
Constant	0.06104***	−0.13566***	−0.10546***
	(0.01045)	(0.01179)	(0.02824)
Year	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled
Number of observations	7119	7200	7155
R^2	0.41696	0.41604	0.12557

Notes: (1)* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.
(2) The standard errors are shown in brackets. The following tables use the same method.

Table 5
Empirical results for the testing of Hypothesis 1.

Variable	Overinv1		Overinv2		Overinv3	
	(1)	(2)	(3)	(4)	(5)	(6)
Media	**−0.00025*** **	**−0.00028*** **	**−0.00021*** **	**−0.00028*** **	**−0.00038*** **	**−0.00041*** **
	(0.00008)	**(0.00008)**	**(0.00005)**	**(0.00006)**	**(0.00009)**	**(0.00009)**
HHI5		−0.01637**		−0.01377**		−0.04093***
		(0.00644)		(0.00583)		(0.00791)
Magstk		0.00057		0.01164**		−0.00999
		(0.00670)		(0.00589)		(0.00764)
Duality		−0.00134		−0.00247		−0.00236
		(0.00238)		(0.00180)		(0.00249)
Boardsize		−0.00072*		−0.00026		−0.00106**
		(0.00042)		(0.00034)		(0.00048)
Idr		−0.02080		−0.01738		−0.02959*
		(0.01309)		(0.01204)		(0.01536)
Fcf		0.00536***		0.00544***		0.00624***
		(0.00052)		(0.00042)		(0.00059)
Lev		0.00126		0.00054***		0.00646***
		(0.00207)		(0.00013)		(0.00114)
Otac		−0.01069		−0.02202		−0.03113
		(0.02175)		(0.01371)		(0.01948)
Constant	0.12448***	−0.13039***	0.01201***	−0.09635***	0.14883***	−0.16615***
	(0.00599)	(0.01105)	(0.00416)	(0.01041)	(0.00564)	(0.01289)
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Number of observations	7118	4954	7200	5040	7128	4959
R^2	0.03413	0.06486	0.00581	0.04907	0.09557	0.15639

Notes: (1)* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table 6
Media governance, property rights and overinvestment.

Variable	(1) State-owned	(2) Non-state-owned	(3) Total sample
Media	**−0.00029*** **	**−0.00032** **	**−0.00028** **
	(0.00008)	**(0.00015)**	**(0.00013)**
Media*SOE			**−0.00013**
			(0.00015)
SOE			0.00623
			(0.00932)
HHI5	−0.02053**	0.00075	−0.01841***
	(0.00810)	(0.01139)	(0.00566)
Magstk	−0.00766	−0.00315	−0.00488
	(0.01074)	(0.00874)	(0.00694)
Duality	0.00042	−0.00133	−0.00093
	(0.00263)	(0.00382)	(0.00225)
Boardsize	−0.00048	−0.00157	−0.00063
	(0.00044)	(0.00101)	(0.00041)
Idr	−0.01280	−0.04775*	−0.02549**
	(0.01599)	(0.02496)	(0.01296)
Fcf	0.00475***	0.00712***	0.00544***
	(0.00058)	(0.00103)	(0.00047)
Lev	−0.00222	0.00183	0.00036
	(0.00396)	(0.00223)	(0.00206)
Otac	−0.03933**	0.02373	−0.02719
	(0.01838)	(0.04698)	(0.02109)
Constant	−0.07078***	−0.08727***	−0.06616***
	(0.01362)	(0.02449)	(0.01183)
Year	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled
Number of observations	3040	1914	4954
R^2	0.08369	0.08422	0.06548

Notes: (1)* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

column of Table 6. The results indicate that regardless of the method adopted to estimate overinvestment, the coefficients for the interaction variable are not significant, indicating that there are no significant differences between state-owned and non-state-owned listed companies.

4.4. Empirical results for Hypothesis 2

Table 7 reports the test results for Hypothesis 2. We can see that the regression coefficient for the interaction term *EM*Media* is significantly negative at the 5% level. In Table 7, column 2, the coefficient for *Media* in the group with low levels of internal governance is −0.00023, while that for the group with high levels of internal governance is −0.00035 (=−0.00023–0.00012). These results confirm Hypothesis 2; that is, when internal corporate governance efficiency is low, the negative association between the level of media governance and the degree of corporate overinvestment is significantly enhanced. This result suggests that the media governance environment plays a stronger complementary role for firms with low internal governance efficiency.

4.5. Robustness tests

To guarantee the reliability of the results, we perform several robustness tests.

4.5.1. Re-estimating the variable for overinvestment

Overinvestment (*Overinv*) is the core variable in this research. To ensure that our conclusions are not driven by the method used to estimate overinvestment, we re-estimate overinvestment in the following ways.

Table 7
Empirical results for the testing of Hypothesis 2.

Variable	(1)	(2)
Media	**−0.00025*** **	**−0.00023** **
	(0.00009)	**(0.00010)**
EM*Media	**−0.00021** **	**−0.00012** **
	(0.00009)	**(0.00006)**
EM	0.00697	0.00686
	(0.00810)	(0.00844)
HHI5		−0.02149***
		(0.00615)
Magstk		0.00130
		(0.00587)
Duality		−0.00092
		(0.00222)
Boardsize		−0.00087**
		(0.00039)
Idr		−0.02344*
		(0.01323)
Fcf		0.00514***
		(0.00051)
Lev		0.00102
		(0.00224)
Otac		−0.01988
		(0.02055)
Constant	0.01902***	−0.06163***
	(0.00539)	(0.01143)
Number of observations	7118	4954
R^2	0.00636	0.04099

Notes: (1)* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

1. By setting a firm's investment level as a function of its ability to grow at the beginning of the year, we estimate each firm's normal investment level. We use the residual from the estimation as an additional proxy for overinvestment, *Overinv4*. Following Biddle et al. (2009) and Chen et al. (2011), normal investment is estimated in Model (4):

$$lnv_{i,t} = \alpha_0 + \beta Growth_{i,t-1} + \epsilon_{i,t} \quad (4)$$

2. Based on the *Overinv1* values estimated by Model (1), we retain only the sample group with residuals greater than 0. The residual measures the overinvestment level, and we define it as *Overinv5*. Xin et al. (2007) and Zhang and Lu (2012) use this method.
3. Based on the *Overinv1* values estimated by Model (1), we divide the data into two categories. We set the group with residual errors greater than 0 to 1 (the overinvestment group), and to 0 otherwise. We then obtain the overinvestment estimator *Overinv6*, and adopt the Logit model for the regression. Jiang et al. (2009) adopt this estimation method.
4. Based on the *Overinv1* values estimated by Model (1), we group our observations by the quartile of the residuals and set the dummy variable *Overinv7* as a proxy for overinvestment. Following Biddle et al. (2009) and Zhang and Lu (2012), we divide the residuals into four groups according to the quartiles. The largest group is defined as the overinvestment group and is assigned a value of 1. We delete the set with the smallest residuals and define the two groups in the middle as the control group, the value of which is 0. A probit model is used for the regression.
5. Studies examining company investment behavior show that cash flow, debt levels and uncertainty are the major factors affecting the level of business investment. However, uncertainty variables are not included in the estimation model used by Richardson (2006),[5] which may distort the estimation of overinvestment. We

[5] This method is the same as Model (1) earlier in this paper.

Table 8
Robustness tests 1.

Variable	(1) Overinv4-OLS	(2) Overinv 5-OLS	(3) Overinv 6-Logit	(4) Overinv 7-Probit
Media	**−0.00031*** **	**−0.00021*** **	**−0.00951*** **	**−0.00625*** **
	(0.00007)	**(0.00011)**	**(0.00296)**	**(0.00218)**
HHI5	0.00549	−0.00950	−0.11884	−0.88480***
	(0.00665)	(0.00986)	(0.26291)	(0.19288)
Magstk	0.06543***	0.01888**	1.89833***	−0.69482***
	(0.00744)	(0.00949)	(0.22562)	(0.16472)
Duality	−0.00662***	−0.00356	−0.35512***	0.01855
	(0.00200)	(0.00276)	(0.07700)	(0.05681)
Boardsize	0.00061	−0.00043	−0.01708	−0.00470
	(0.00040)	(0.00054)	(0.01698)	(0.01228)
Idr	−0.00872	−0.04224**	−0.24491	0.30987
	(0.01359)	(0.01890)	(0.57885)	(0.42662)
Fcf	0.01123***	0.00358***	0.17587***	0.14567***
	(0.00049)	(0.00067)	(0.02119)	(0.01584)
Lev	0.00009	0.00144	0.18172***	−0.01221
	(0.00035)	(0.00122)	(0.04414)	(0.02260)
Otac	−0.09006***	−0.02790	1.27237*	−1.72347***
	(0.01599)	(0.04234)	(0.71336)	(0.63035)
Constant	−0.11232***	−0.01075	−2.54870***	−3.00508***
	(0.01182)	(0.01934)	(0.52299)	(0.37663)
Year	Controlled	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled	Controlled
Number of observations	5098	2076	5670	4467
R^2	0.26492	0.07622	0.0673	0.0801

Notes: (1)* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

add uncertainty variables and stock price volatility (*Stock*) to the original model and re-estimate *Overinv1*, *Overinv2* and *Overinv3* to generate three new overinvestment estimators, *Overinv8*, *Overinv9* and *Overinv10*.

6. In general, firms with high levels of free cash flow and a lack of investment opportunities tend to overinvest. We divide the sample firms into overinvestment and underinvestment groups based on these two variables, forming a new variable *Overinv11*. For both free cash flow and investment opportunities, we divide the firms into high and low groups by the medians, with investment opportunities being measured by the Tobin's Q values (Zhong et al., 2010). We define *Overinv11* as being equal to 1 for firms with a combination of high free cash flow and low investment opportunities, and 0 otherwise. Because this overinvestment estimation method is not based on Richardson (2006), some firm-level characteristic variables are not effectively controlled for and we thus add these to the regressions.

The regression results for media governance using the four estimation methods for overinvestment (*Overinv4*, *Overinv5*, *Overinv6*, and *Overinv7*) are shown in estimations (1), (2), (3) and (4) in Table 8. The results using estimation methods (5) and (6) (*Overinv8*, *Overinv9*, *Overinv10*, and *Overinv11*) are shown in Table 9. In all cases, the coefficients for the media governance variable (Media) are significantly negative, suggesting that our conclusions are not affected by the overinvestment estimation method used.

4.5.2. Balanced panel data

To examine as many firms as possible, the foregoing results are based on non-balanced panel data, which may cause bias. We re-select the sample retaining only those listed firms with complete data for the five years from 2007 to 2011, and perform the tests again. The results for *Overinv1*, as an example, are given in Table 10, column 1. The regression results show that the coefficient for media governance (*Media*) is significantly negative, which is consistent with our previous results.

Table 9
Robustness tests 2.

Variable	(1) Overinv 8-OLS	(2) Overinv 9-OLS	(3) Overinv 10-OLS	(4) Overinv 11-probit
Media	**−0.00024*** **	**−0.00024*** **	**−0.00062*** **	**−0.00478** **
	(0.00007)	**(0.00007)**	**(0.00016)**	**(0.00243)**
HHI5	−0.01462**	−0.01641***	−0.08274***	0.76693***
	(0.00596)	(0.00565)	(0.01403)	(0.22194)
Magstk	0.00283	0.01175**	0.03731***	0.66298***
	(0.00633)	(0.00488)	(0.00857)	(0.21958)
Duality	−0.00314*	−0.00322*	−0.00071	0.03826
	(0.00187)	(0.00175)	(0.00393)	(0.06388)
Boardsize	−0.00041	−0.00069**	−0.00399***	−0.00726
	(0.00035)	(0.00035)	(0.00101)	(0.01370)
Idr	−0.01609	−0.02167*	−0.07027**	−0.24077
	(0.01215)	(0.01206)	(0.03019)	(0.46628)
Fcf	0.00515***	0.00578***	0.02080***	0.33683***
	(0.00043)	(0.00042)	(0.00109)	(0.02484)
Lev	0.00396***	0.00350***	0.00436	0.10250***
	(0.00094)	(0.00098)	(0.00283)	(0.02781)
Otac	−0.02010	−0.01528	−0.05264	−0.31735
	(0.01531)	(0.01562)	(0.04807)	(0.70104)
Asset				0.38911***
				(0.03562)
Growth				−0.07653*
				(0.03948)
Return				−0.63669***
				(0.07333)
Age				−0.01717***
				(0.00654)
Cash				−0.23504
				(0.19738)
Constant	−0.12766***	−0.04767***	−0.20275***	−14.35959***
	(0.01013)	(0.01041)	(0.02989)	(0.62496)
Year	Controlled	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled	Controlled
Number of observations	4896	5435	5446	4938
R^2	0.07833	0.08167	0.10674	–

Notes: (1)* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

4.5.3. Re-estimating the media governance variable

We use OLS trend prediction to estimate the media governance variable (*Media*) for 2011 from an averaged index of media development for each of 2007 to 2010 and the Media Development Index for 2010. In this way we obtain new estimators *Media2* and *Media3*. We re-run the tests and provide the results in Table 10 (using the dependent variable *Overinv1* as an example, the results are the same as before).

The media governance levels are measured by the regional media governance environment and this may be highly correlated with the overall environment and with the marketization level in different regions. To prevent a potential influence on our estimations, we perform the following two supplementary tests. First, we add control variables for the marketization index (*Market*) to Model (2) to rule out the effect of the degree of marketization on the results. This index is derived from the marketization report of Fan et al. (2011) for China.[6] Second, we use the Baidu Media Index (*Media4*) to reassess the levels of media governance. We hand-collect the Baidu Media Index data for all of the listed companies in 2011 (to be statistically consistent,

[6] The index consists of 23 indicators, with each indicator scoring all of the provinces by establishing the relative position of the marketization process in each field. We use principal component analysis to determine each individual item's weight in the aspects index, and use these weights to calculate an aspects index. In addition, we use the same method to determine each aspect's weight in the total index, and use these weights to calculate the total index.

Table 10
Robustness test 3.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Media	**−0.00029*** **			**−0.00026*** **		**−0.00036*** **	**−0.00026*** **
	(0.00008)			**(0.00008)**		**(0.00007)**	**(0.00007)**
Media2		**−0.00026*** **					
		(0.00008)					
Media3			**−0.00027*** **				
			(0.00008)				
Media4					**−0.00021***		
					(0.00012)		
ST*Media							**−0.00023*** **
							(0.00008)
ST							0.00357
							(0.06897)
HHI5	−0.01597**	−0.01638**	−0.01636**	−0.01589**	−0.01882***	−0.01913***	−0.02266***
	(0.00662)	(0.00645)	(0.00645)	(0.00645)	(0.00637)	(0.00607)	(0.00627)
Magstk	−0.00287	0.00058	0.00060	0.00095	−0.00167	−0.00176	0.00317
	(0.00809)	(0.00671)	(0.00670)	(0.00673)	(0.00663)	(0.00608)	(0.00616)
Duality	−0.00073	−0.00135	−0.00134	−0.00126	−0.00115	−0.00124	−0.00128
	(0.00249)	(0.00238)	(0.00238)	(0.00238)	(0.00240)	(0.00195)	(0.00195)
Boardsize	−0.00070*	−0.00072*	−0.00072*	−0.00072*	−0.00070*	−0.00067*	−0.00098**
	(0.00043)	(0.00042)	(0.00042)	(0.00042)	(0.00042)	(0.00040)	(0.00041)
Idr	−0.02149	−0.02078	−0.02084	−0.01997	−0.01873	−0.02598*	−0.02142
	(0.01347)	(0.01309)	(0.01309)	(0.01301)	(0.01305)	(0.01404)	(0.01408)
Fcf	0.00519***	0.00536***	0.00536***	0.00534***	0.00543***	0.00538***	0.00526***
	(0.00052)	(0.00052)	(0.00052)	(0.00052)	(0.00053)	(0.00046)	(0.00048)
Lev	0.00138	0.00127	0.00126	0.00124	0.00123	0.00048	0.00171
	(0.00207)	(0.00207)	(0.00207)	(0.00207)	(0.00203)	(0.00164)	(0.00167)
Otac	−0.01346	−0.01037	−0.01059	−0.00872	−0.00538	−0.02767	−0.01965
	(0.02192)	(0.02176)	(0.02176)	(0.02179)	(0.02186)	(0.02056)	(0.02091)
Market				−0.00009			
				(0.00035)			
Constant	−0.00074	−0.03759***	−0.03724***	−0.03415***	−0.05148***	−0.05695***	−0.05889***
	(0.01178)	(0.01143)	(0.01145)	(0.01198)	(0.01178)	(0.01103)	(0.01202)
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled	Controlled	Controlled	–	Controlled
Number of observations	4734	4954	4954	4927	4951	4954	4954
R^2	0.06318	0.06471	0.06480	0.06495	0.06250	0.03433	0.04073

Notes: (1)* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

we use stock names as the search terms), and use the firm-level media governance index to reduce the influence of other regional factors as much as possible. The results are given in Table 10, columns 2, 3, 4 and 5.[7]

The coefficients for the media governance variables (*Media2*, *Media3* and *Media4*) are all significantly negative. After controlling for the marketization variable, the coefficient for media governance (*Media*) is still significantly negative, suggesting that the results are not affected by the method used to measure media governance.

4.5.4. Re-selecting the econometric method

The main econometric method used is OLS. A panel data model is likely to have fewer missing variables, allowing better elimination of the effect of these non-observed factors. We also examine how fixed effects influence the results. The regression results are given in Table 10, column 6. The coefficient for the media governance variable (*Media*) is significantly negative at the 1% level, indicating that the results are not affected by the econometric method used.

[7] The Baidu Media Index is a number related to the keywords recorded by the Baidu news channel for Internet media news reports.

Table 11
Endogeneity tests.

Variable	(1) 2SLS	(2) GMM
Media	**−0.00032*** **	**−0.00049*** **
	(0.00009)	**(0.00018)**
HHI5	−0.01592**	0.00525
	(0.00639)	(0.02262)
Magstk	0.00094	0.03538
	(0.00666)	(0.04553)
Duality	−0.00139	0.00109
	(0.00234)	(0.00348)
Boardsize	−0.00072*	0.00014
	(0.00042)	(0.00087)
Idr	−0.02101	−0.02397
	(0.01297)	(0.01617)
Fcf	0.00538***	0.00503***
	(0.00051)	(0.00063)
Lev	0.00127	0.00201
	(0.00205)	(0.00237)
Otac	−0.01158	−0.03772
	(0.02147)	(0.03748)
Constant	−0.05921***	−0.01728
	(0.01179)	(0.04589)
Year	Controlled	Controlled
Industry	Controlled	Controlled
Number of observations	4954	4954
R^2	0.06478	–

Notes: (1)* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

4.5.5. Re-estimating the variable for internal governance efficiency

The preceding portion of this paper uses the work of Chen et al. (2013) to choose the proxy for the internal governance efficiency of a company. To test the robustness of Hypothesis 2, we use ST firms (*ST*) as the measure of low internal governance efficiency, setting *ST* to 1 when a firm receives special treatment, and 0 otherwise. Column 10 of Table 7 gives the results. The regression coefficient for the interaction variable *ST*Media* is significantly negative at the 1% level. These results confirm Hypothesis 2; that is, when corporate internal governance efficiency is lower, the negative relationship between the level of external media supervision and overinvestment is more pronounced.

4.5.6. Endogeneity tests

According to past research, many factors influence overinvestment (*Overinv*), such as the institutional environment (Yang and Hu, 2007), bank credit (Luo et al., 2012), cash distributions (Zhang and Lu, 2012) and the background governance (Jiang et al., 2009). Extra-regional governance indicators such as these are correlated with some extent with media governance (*Media*). There may also be a bias caused by omitted variables in the foregoing results.

Accordingly, this paper further adopts the instrumental variable method to solve the problem of endogeneity. We use four variables as instrumental variables: the per capita number of newspapers in print (*Newspaper*), the per capita number of magazines in print (*Magazine*), TV ownership per 100 households (*Television*), and computer ownership per 100 households (*Computer*). The data are derived from the China Statistical Yearbook (2008–2012) and the Collection of China Press and Publication Statistical Data (2008–2012). These variables are highly correlated with media governance (*Media*) (the correlation coefficients are 0.375, 0.710, 0.554, and 0.871, respectively), but no direct relationship between these variables and overinvestment (*Overinv1*) is found (the correlation coefficients are 0.026, 0.026, 0.058, and 0.052, respectively). We re-estimate the results using two-stage least squares (2SLS) regressions; column 1 in Table 11 shows the results. Then, to take account of heteroskedasticity within a large sample, we use the generalized method of moments (GMM); the results of which are shown in column 2 of Table 11.

The regression results are consistent with the previous conclusion that media governance (*Media*) and overinvestment (*Overinv*) are significantly negatively related.

Having carried out these tests, we believe that this paper's conclusions are robust.

5. Conclusion and discussion

Based on China's A-share listed firms from 2007 to 2011, this paper empirically tests how the level of media governance affects the level of corporate overinvestment. We find that when a region has a stronger media governance environment, levels of overinvestment by corporations are lower, suggesting that media governance significantly restricts overinvestment behavior. There is no significant difference in media governance between state-owned and non-state-owned corporations. Further, when corporate governance efficiency is low, the negative relationship between the media environment and overinvestment behavior is significantly enhanced. To guarantee the reliability of our results, we carry out multiple robustness tests, but the results remain unchanged.

This paper shows that a strong media supervision environment can create potential constraints on corporations that help to reduce overinvestment. In particular, when a formal system of internal governance fails, external supervision or informal institutional mechanisms can play an important supplementary role. Our conclusions highlight the important role played by media supervision in corporate governance, and especially in overinvestment, from the perspective of external corporations or informal institutions.

It should be noted that our focus is on the effect of the media governance environment in the region in which a corporation is located on the local investment efficiency of listed companies and we do not specifically analyze the degree to which firms' behavior may vary under the influence of emerging media that can break through regional limits, such as the media's interest in individual corporations, micro-blogging and Weixin. These types of media could be the focus of future research.

Acknowledgment

The authors appreciate financial support from National Natural Science Foundation of China – China (Approval No. 71202030, and 71132004), and the Fundamental Research Funds for the Central Universities – China.

References

Baker, M., Stein, J.C., Wurgler, J., 2003. When does the market matter? Stock prices and the investment of equity-dependent firms. Quart. J. Econ. 118 (3), 969–1005.

Besley, T., Prat, A., 2002. Handcuffs for the grabbing hand? Media capture and government accountability. Am. Econ. Rev. 96 (3), 710–736.

Biddle, G.C., Hilary, G., Verdi, R.S., 2009. How does financial reporting quality relate to investment efficiency? J. Account. Econ. 48 (2), 112–131.

Chen, Y., Xie, D., 2011. Network location, the independent director governance and investment efficiency. Manage. World 7, 113–127.

Chen, F., Hope, O., Li, Q., 2011. Financial reporting quality and investment efficiency of private firms in emerging markets. Account. Rev. 86 (4), 1255–1288.

Chen, D., Hu, X., Liang, S., Xin, F., 2013. Religious traditions and corporate governance. Econ. Res. J. 9, 71–83.

Cheng, M., Dhaliwal, D., Zhang, Y., 2013. Does investment efficiency improve after the disclosure of material weakness in internal control over financial reporting? J. Account. Econ. 56 (1), 1–18.

China Statistical Yearbook, 2008–2012. China Statistics Press, Beijing.

Chung, K.H., Wright, P., Kedia, B., 2003. Corporate governance and market valuation of capital and R&D investments. Rev. Financ. Econ. 12 (2), 161–172.

Collection of China Press and Publication Statistical Data, 2008–2012. Chinese Book Company, Beijing.

Craven, B.M., Marston, C.L., 1997. Investor relations and corporate governance in large UK companies. Corp. Governance Int. Rev. 5 (3), 137–151.

Dyck, A., Volchkova, N., Zingales, L., 2008. The corporate governance role of the media: evidence from Russia. J. Finance 63 (3), 1093–1135.

Fama, E.F., Jensen, M.C., 1983. Separation of ownership and control. J. Law Econ. 26 (2), 301–325.

Fan, G., Wang, X., Zhu, H., 2011. NERI INDEX of marketization of China's provinces 2011 Report. Economic Science Press.

Fazzari, S., Hubbard, R.G., Petersen, B.C., 1988. Financing constraints and corporate investment. Brook. Pap. Econ. Activity 1, 141–195.
Gillan, S.L., 2006. Recent developments in corporate governance: an overview. J. Corp. Finance 12 (3), 381–402.
He, J., Wei, M., 2012. Control rights, media, and market governance effects: perspective of financial report restatements. Account. Res. 4, 36–43.
Heinkel, R., Zechner, J., 1990. The role of debt and preferred stock as a solution to adverse investment incentives. J. Financ. Quant. Anal. 25 (1), 1–24.
Huang, Q., Shen, H., 2009. Source of debt, debt maturity structure and cash flow over-investment: empirical evidence based on the Chinese listed companies in manufacturing industry. J. Financ. Res. 9, 143–155.
Jensen, M., 1986. Agency cost of free cash flow, corporate finance, and takeovers. Corp. Finance Takeovers Am. Econ. Rev. 76 (2).
Jiang, F., Yin, Z., Su, F., 2009. Managers background characteristics and corporate over-investment behavior. Manage. World 1, 130–139.
Joe, J.R., Louis, H., Robinson, D., 2009. Managers' and investors' responses to media exposure of board ineffectiveness. J. Financ. Quan. Anal. 44 (03), 579–605.
Li, W., Jiang, T., 2007. Corporate governance and over-investment of listed companies in China. Finance Trade Econ. 12, 56–61.
Li, P., Shen, Y., 2010. The corporate governance role of media: empirical evidence from China. Econ. Res. J. 4, 14–27.
Li, C., Xiong, Y., 2012. Media governance: role, mechanism and effect. A review based on previous studies of the investor protection framework. J. Xiam. Univ. (Arts Soc. Sci.) 2, 9–16.
Liang, H., Yao, Y., Ning, J., 2012. Media exposure, corporate governance and agency costs. J Finance Econ. 7, 90–100.
Luo, J., Wan, D., Cai, D., 2008. Large shareholder governance and managers' over-investment behavior. Econ. Manage. Z1, 33–39.
Luo, D., Ying, Q., Ying, Q., Chang, L., 2012. Bank credit, property rights, and corporate over-investment: the empirical evidence of China's listed companies. J. World Econ. 3, 48–67.
Miller, G.S., 2006. The press as a watchdog for accounting fraud. J. Account. Res. 44 (5), 1001–1033.
Myers, S.C., Majluf, N.S., 1984. Corporate financing and investment decisions when firms have information that investors do not have. J. Financ. Econ. 13 (2), 187–221.
Allen, F., Qian, J., Qian, M., 2005. Law, finance, and economic growth in China. J. Financ. Econ. 77 (1), 57–116.
Owen, B.M., 2002. Media as Industry: Economic Foundations of Mass Communications. World Bank Institute Development Series.
Pan, M., Jin, Y., 2003. Information asymmetry, equity arrangement, and corporate over-investment. J. Finance 1, 36–45.
Richardson, S., 2006. Over-investment of free cash flow. Rev. Acc. Stud. 2–3, 1–5.
Shleifer, A., Vishny, R.W., 1997. A survey of corporate governance. J. Finance 52 (2), 737–783.
Tang, X., Zhou, X., Ma, R., 2007. Empirical research on over-investment behavior and its restriction systems in China's listed companies. Account. Res. 7, 44–52.
Tang, X., Zhou, X., Ma, R., 2010. Government intervention, GDP growth and local state-owned enterprises over-investment. J. Finance 8, 33–48.
Wang, Y., 2009. Financing constraints, cash holdings and overinvestment. J. Finance 7, 121–133.
Wei, M., Liu, J., 2007. Dividends of State-owned enterprises, corporate governance and overinvestment. Manage. World 4, 88–95.
Wu, C., Ye, X., Wu, S., 2012. The role of the media in replacing politically connected CEOs: evidence from China. Econ. Manage. 2, 57–65.
Xin, Q., Lin, B., Wang, T., 2007. Government control, manager compensation and capital investment. Econ. Res. J. 8, 110–122.
Xu, L., Xin, Y., 2011. Media coverage and minority shareholder protection. Nankai Business Rev. 06, 36–47.
Yan, X., 2008. The role of media in governance of listed companies and functions. Econ. Manage. 9, 72–76.
Yang, H., Hu, Y., 2007. The institutional environment and over-investment of free cash flow. Manage. World 9, 99–106.
Yang, D., Zhao, C., 2012. Media monitoring, media governance and executive salary. Econ. Res. J. 6, 116–126.
Yao, Y., Liang, H., Ning, J., 2011. A study on the mechanism of how media monitoring affects enterprise performance – evidence from the fast moving consumer goods industry in China. China Ind. Econ. 9, 151–160.
Ye, J., Zhao, S., Li, D., 2012. Institutional investors' governance role: excessive investment perspective. Securities Market Herald 5, 27–35.
Yu, G., 2012. Annual report on China's media development index (2012). People's Daily Publishing Corporation.
Yu, H., Xu, L., Chen, B., 2010. The control right of ultimate controlling shareholder and overinvestment of free cash flow. Econ. Res. J. 8, 103–114.
Yu, Z., Tian, L., Qi, B., 2011. The mechanisms of media's governance role: from earnings management perspective. Manage. World 9, 127–140.
Zavyalova, A., Pfarrer, M.D., Reger, R.K., Shapiro, D.L., 2012. Firm actions and industry spillovers on media coverage following wrongdoing. Acad. Manag. J. 55 (5), 1079–1101.
Zhang, Y., 2009. A review on the relationship between media and corporate governance. Econ. Perspec. 6, 137–141.
Zhang, C., Lu, W., 2009. Information disclosure, information intermediary, and corporate over-investment. Account. Res. 1, 60–65.
Zhang, H., Lu, Z., 2012. Cash distribution, corporate governance, and over-investment: A study based on cash holdings of listed firm and its subsidiaries. Manage. World 3, 141–150.
Zhang, J., Lui, X., 2011. The role of media in corporate governance. Commun. Finance Account. 18, 123–125.
Zhang, H., Wang, Z., 2010. Government intervention, government's goal and over-investment of state-owned listed companies. Nankai Business Rev. 3, 101–108.
Zheng, Z., Ding, D., Wang, C., 2011. Media's negative reports, managers' reputation and corporate performance improvement: evidence from Chinese listed companies. J. Finance 12, 163–176.
Zhong, H., Ran, M., Wen, S., 2010. Government intervention, insider control and corporate investment. Manage. World 7, 98–108.

China Journal of Accounting Research 8 (2015) 59–73

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China Journal of Accounting Research

journal homepage: www.elsevier.com/locate/cjar

Career concerns, shareholder monitoring and investment efficiency: From the perspective of compensation contract rigidity in Chinese SOEs

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ARTICLE INFO

Article history:
Received 1 February 2013
Accepted 7 January 2015
Available online 7 February 2015

JEL classification:
M12
M52
O16

Keywords:
Career concerns
Shareholder monitoring
Investment efficiency
Compensation contract rigidity
SOEs

ABSTRACT

This paper presents theoretical analysis of how career concerns and shareholder monitoring affect chief executive officer (CEO) agency costs. We investigate investment efficiency prior to CEO retirement based on a sample of Chinese state-owned enterprises (SOEs) during the 1999–2007 period and find that there is a significant decline in investment efficiency prior to CEO retirement, relative to other periods, and that this decline becomes less significant under stronger shareholder supervision. Our research furthers understanding of the significance of SOE incentive and monitoring mechanisms.

1. Introduction

The debate surrounding China's retirement system has heated up in recent years, particularly regarding the issue of whether the country should introduce a flexible retirement system. Some scholars believe that it would

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http://dx.doi.org/10.1016/j.cjar.2015.01.003
1755-3091/

be reasonable to raise the retirement age and implement a flexible retirement system to compensate for the rising average life expectancy in China (Li, 2012).[1] In addition to this macroeconomic viewpoint, it is important to investigate the issues involved from a microeconomic perspective, considering, for example, whether a more flexible retirement system could alleviate CEOs' lack of career concern incentives resulting from the mandatory retirement age, reduce agency costs and maintain or improve the performance of Chinese state-owned enterprises (SOEs). These issues are in urgent need of theoretical and empirical evidence.

In theory, career concern incentives have dual effects. On the one hand, early in CEOs' careers, such incentives help to mitigate agency costs between CEOs and shareholders (Fama, 1980; Holmström, 1999). On the other hand, when CEOs are approaching retirement, a lack of career concern incentives can lead to a horizon problem for CEOs and increase agency costs, which can be characterized as a decline in investment efficiency, increased private benefits of control gained through insider trading, excessive remuneration and increased perquisite consumption. Because investment is an important source of corporate value, a decrease in investment efficiency equates to a loss in value. Thus, a change in investment efficiency offers a useful perspective for examining agency costs immediately before CEOs retire.

Many studies have discussed the rigidity of the compensation contracts awarded to CEOs of Chinese SOEs and the consequences thereof (Chen et al., 2005; Xin et al., 2007; Wan and Chen, 2012). Here, we analyze how the lack of career concern incentives influences investment efficiency under the mandatory retirement of SOE CEOs from the perspective of compensation contract rigidity.[2] We also investigate whether shareholder supervision can serve as a substitute to reduce agency costs and increase investment efficiency.

Our theoretical analysis leads to the conclusion that investment efficiency often declines immediately before SOE CEOs retire, although that decline becomes insignificant in the presence of stronger shareholder supervision. Empirical analysis of investment efficiency as CEOs approach retirement in a sample of 256 publicly listed SOEs in the 1999–2007 period produces further support for this conclusion.

The remainder of the paper is organized as follows. We review the literature in Section 2, discuss the background to the study and propose hypotheses in Section 3, outline our research design in Section 4 and display our empirical results and analysis in Section 5. Section 6 concludes the paper.

2. Literature review

2.1. Managerial labor market and career concerns

Managerial labor market mechanisms include the CEO appointment mechanism, compensation and incentive mechanism, and dismissal and exit mechanism. Prior research shows that although the managerial labor market for Chinese SOEs is still controlled to a certain extent (Liu, 2001; Chen, 2003), its efficiency has gradually improved, as indicated by the marketization of compensation, increased pay-performance sensitivity (Zhou, 2003; Zhou and Huang, 2006; Lv and Zhao, 2008; Wu and Wu, 2010; Chen and Li, 2011) and a more efficient appointment and dismissal mechanism (Zhu, 2002; Fang et al., 2007).

In addition, researchers have recently turned their attention to the prescriptive 60-year-old retirement age for SOE CEOs in China. Although it may seem reasonable, this mandatory retirement age can have adverse effects on the performance of SOEs. Thus, it needs to be discussed as a critical problem in the SOE reform process. Previous studies have investigated perquisite consumption immediately before the retirement of SOE CEOs (Wan and Chen, 2012) and find that the imminent retirement of its CEO is associated with lower SOE performance (Zhang, 2010). However, further research is needed to determine how career concern incentives affect the financial decisions of SOEs, particularly with regard to the crucial issue of investment efficiency.

[1] As reported in (Li, 2012), some scholars hold the opinion that as average life expectancy rises in China, raising the retirement age and introducing a flexible retirement system will provide an ideal solution to the retirement age issue. While other scholars propose that China should implement a flexible retirement system, but note that the opinions of individuals and employers should be consulted rather than simply sorting by industries or groups.

[2] Career concern incentives include both external labor market incentives, such as the CEO's positions outside his/her current firm, and internal labor market incentives, such as how fast and by what means the CEO can get promoted inside that firm (Brickley et al., 2006). Because dismissal or demotion can cause negative incentives, career concern incentives can be viewed as opportunities for CEOs to take positions outside the company and to be promoted or remain inside the company.

2.2. Dynamic adjustment of incentive contracts and compensation contract rigidity

The effectiveness of an incentive contract and its influence on CEO behavior are of great interest in the corporate governance literature. Incentive contracts include not only the explicit incentive of compensation, but also the implicit incentive of career concerns (or the managerial labor market). Fama (1980) believes that a CEO can realize his/her value through market pricing if the CEO market is efficient, in which case the marginal utility of explicit incentives must equal that of implicit incentives. Whereas, Holmström (1999) maintains that the managerial labor market cannot completely resolve the problem of incentives, as a CEO may work hard early in his/her career and then become a buck-passer later on. To overcome the shirking problem, Gibbons and Murphy (1992) propose strengthening pay-performance sensitivity as a CEO ages, particularly when he/she is approaching retirement, thereby making special arrangements to eliminate opportunistic behavior in the retirement term. The aforementioned studies view explicit and implicit incentives as substitutive in nature. More importantly, they state that if a compensation contract can be adjusted flexibly, then CEOs should be offered more explicit incentives late in their careers to guarantee the effectiveness of compensation contracts, mitigate agency costs and sustain or increase firm value.

A CEO's incentive contract should take into consideration the effect of his/her current work on both his/her current and future pay. The former embodies compensation incentives (explicit incentives), whereas the latter embodies career concern incentives (implicit incentives). In theory, an optimal incentive contract should optimize total incentives and if contracts can be adjusted to various environments, then different types of contracts can apply to different contract environments while leading to the same effects. In other words, such optimal contracts always achieve optimal effects regardless of the circumstances. For instance, Choe (2006) examines optimal CEO compensation contracts in different conditions and finds that when return on investment (ROI) is considered, the best contract includes base pay, a severance package and a bonus. When ROI is not factored in, restricted shares and stock options are alternatives. Both types of contracts achieve the same effects. Hence, the optimality of an incentive contract is determined by whether it can be flexibly adjusted as inventive circumstances or contract factors change.

Most international research in this area assumes the precondition of a mature managerial labor market and flexible compensation contracts, and thus their results may not apply to China. Chinese researchers realize that SOEs are bound by compensation regulations, which can have significant effects on a CEO's perquisite consumption and investment decisions. The rigidity of Chinese SOE incentive contracts also mean that firms cannot revise CEO compensation contracts to optimize total incentives in the absence of career concern incentives.

2.3. Incentive contracts, shareholder monitoring, and investment efficiency

Prior research shows that incentive contracts exert a significant effect on both investment decisions (Larcker, 1983; Chen and Clark, 1994) and mergers and acquisitions (M&As) (Lewellen et al., 1985; Tehranian et al., 1987). Incentive contracts not only influence the motivation for and scale of investments, but also their efficiency. In general, a pay-performance-sensitive contract aligns the interests of CEOs and shareholders, prompting CEOs to make investment decisions that boost firm value (Morck et al., 1990; McConnell and Servaes, 1990; Jensen and Murphy, 1990). Bliss and Rosen (2001) find that younger CEOs tend to engage in more M&As, evidence for the important role that implicit incentives play in M&As. Minnick et al. (2011) show that firms with higher pay-performance sensitivity experience higher abnormal returns when announcing an M&A decision and higher subsequent performance. These findings indicate that an effective incentive contract, whether explicit or implicit, can motivate M&As and boost M&A efficiency.

Research on shareholder monitoring and investment efficiency indicates that financial constraints on investment can be influenced by both ownership structure (Zheng et al., 2001) and the controlling shareholder's stockholding (Rao and Wang, 2006). Moreover, if a company's majority shareholder is stated-owned, excessive investments occur more frequently, whereas a higher tradable stock proportion results in the opposite (Xu and Zhang, 2009). Dou et al. (2011) find that under the condition of joint control by multiple large shareholders, mutual monitoring can mitigate excessive investment.

Chinese research that takes the rigidity of SOE compensation contracts into consideration finds that such rigidity can affect investment efficiency. However, because SOE CEOs have access to implicit compensation in the form of perquisite consumption and implicit incentives in the form of career concern incentives, contract rigidity may be compensated for to some extent. Theoretical models show that, of the two means of keeping the issue of CEOs' moral hazard under control, the weight given to incentive mechanisms versus supervisory mechanisms depends on the trade-off between their costs (Demougin and Fluet, 2001). However, in the absence of career concern incentives, further theoretical analysis and empirical evidence are needed to determine whether shareholder monitoring can serve as a substitute in controlling agency costs.

2.4. Current study and its contributions

Our review of the literature suggests that most Western research in this area is largely inapplicable to the SOE managerial labor market in China, and the characteristics of the compensation incentives discussed therein and conclusions drawn are thus not generalizable to China. Compensation incentive rigidity is quite common in China and thus offers a useful perspective and foundation for the study reported herein. Such rigidity can result in principals' inability to adjust compensation contracts in a timely fashion in response to a particular CEO's conditions. It also means that SOEs are deficient in CEO incentives. Previous research has paid attention to the economic consequences of compensation rigidity, but is largely silent on career concern incentives, the main type of implicit incentive. Here, we examine changes in investment efficiency and the role that shareholder monitoring plays when SOEs face the dual constraints of compensation contract rigidity and a lack of career concern incentives as CEOs approach retirement. We are particularly interested in the last term before retirement, which we call the "retirement term" for short. This paper contributes to the CEO market and career concern incentives literature by offering a financial decision-making perspective.

3. Theoretical analysis and hypotheses

3.1. Career concern incentives and investment efficiency under compensation contract rigidity

The foregoing literature review shows that if compensation contracts can be adjusted flexibly, optimal incentives can in theory be achieved for CEOs regardless of whether they are close to retirement,[3] and investment efficiency may not necessarily deteriorate. Our interest here, however, is how career concern incentives influence investment efficiency under the rigidity of the compensation regulations in place for Chinese SOEs.

On the one hand, an absence of career concern incentives can result in underinvestment. Because the Chinese SOE managerial labor market is regulated, SOE compensation contracts generally lack pay-performance sensitivity. At the same time, increases in cash compensation are constrained by various kinds of political power. Therefore, it is quite difficult to make special arrangements for CEOs before their retirement. Further, equity incentives are usually insufficient and overly related to specific positions. They are thus unable to successfully render future firm performance endogenous to current CEO pay, and CEOs are unable to enjoy future compensation arising from current successful investments. The absence of career concern incentives in conjunction with a lack of alternative explicit contracts, and no motive to collect information on investment opportunities, can lead CEOs to shirk their responsibilities in their retirement term. SOE underinvestment is the result.

On the other hand, compensation contract rigidity is more likely to have the opposite effect, namely, overinvestment, as it can serve as a convenient way to obtain private benefits of control. Wan and Chen (2012) find that SOE CEOs enjoy more perquisite consumption rights before retirement (when there is a lack of shareholder monitoring), which may be caused by their stronger rent-seeking motive in their retirement term. Gaining private benefits of control via investment is a more typical form of agency problem than

[3] For example, Gibbons and Murphy (1992) investigate the characteristics of optimal incentive contracts when imminent retirement has resulted in horizon problems and a lack of career concerns in CEOs. They conclude that, as implicit incentives decline when a CEO gets close to retirement, it is better to strengthen pay-performance sensitivity to reinforce implicit incentives, including stock incentives (Dechow and Sloan, 1991), or confer more options, thereby increasing pay-R&D sensitivity (Cheng, 2004).

rent-seeking through perquisite consumption. Jensen and Meckling (1976) and Shleifer and Vishny (1989) believe that CEOs who lack equity incentives are more impelled to invest excessively. Hao et al. (2010) survey a number of papers in this area and conclude that excess investment is quite common in capital investment decisions because CEOs are motivated to consolidate and expand their benefits of control. As Chinese SOEs have yet to establish a mature incentive and supervisory mechanism, and lack an effective system of accountability, CEOs seldom pay the price for investment failures. Hence, CEOs are driven to gain more private benefits of control, which can lead to abuse of free cash flows and to overinvestment.

Thus, a lack of career concern incentives brings about a lower degree of investment efficiency under the condition of compensation contract rigidity. In theory, post-retirement employment can help to mitigate or eliminate the horizon problems of CEOs caused by retirement and increase investment efficiency. Brickley et al. (2006) investigate CEOs' pre-retirement agency costs from the perspective of post-retirement position incentives (continuing to serve as a director of the current or another company), and consider that such incentives do help to reduce these costs. They find that CEOs who exhibit better performance are more likely to be appointed as directors after retirement. However, this mechanism is uncommon among Chinese SOEs. As the SOE managerial labor market is far from well-established, CEOs have no opportunities to remain with their company or work in another after retirement (Wan and Chen, 2012). In addition, the prescriptive retirement age for SOE CEOs lacks flexibility, which renders it difficult in China to mitigate the agency problem induced by retirement through post-retirement re-employment plans or flexible retirement plans.

Compared to retirement term CEOs, those who quit their jobs have more career concern incentives. When these incentives are in place, the reputation mechanism works to some extent regardless of the efficiency of the managerial labor market. Accordingly, a CEO who resigns from his/her position with one company can usually take up a position with another SOE under the existing SOE executive appointment system. Hence, they have an opportunity to remain or be promoted within the SOE system,[4] and are more likely to reap the benefits (or suffer the consequences) of successful (or failed) investments. Such CEOs must thus take into consideration the influence of current investments on future career prospects, and are more likely to make decisions in accordance with their company's investment opportunities, which can in turn increase investment efficiency. The end result is that agency costs may not rise systematically and there may be little reduction in investment efficiency.

To sum up, SOE CEO compensation contracts are not optimal in the run-up to retirement. Both under- and over-investment decrease investment efficiency. But, CEOs who resign from their jobs rather than retire appear to face a different situation.

This discussion leads us to propose Hypothesis 1: When SOE CEOs are approaching retirement, a lack of career concern incentives and compensation contract rigidity results in a decline in firms' investment efficiency.

3.2. Shareholder monitoring and investment efficiency before CEO retirement

Can shareholder monitoring have a constrictive effect when the approaching retirement of CEOs leads to a decline in investment efficiency? Firth et al. (2002) suggest that Chinese firms are more reliant on internal than external control mechanisms to restrict a CEO's adverse behavior. Theoretically, internal control mechanisms are achieved primarily through equity restrictions and board supervision. However, an important feature of the corporate governance landscape in China is a strong controlling shareholder combined with a weak board (Corporate Governance Evaluation Team within Corporate Governance Research Center of Nankai University, 2004). Zeng and Chen (2006) show that board independence has almost no influence on a company's agency costs, whereas the nature of the ultimate controller does. This paper is concerned primarily with the influence of the controlling shareholder.

Researchers have demonstrated that the financial constraints of investment within a company are affected by its ownership structure (Zheng et al., 2001), that the majority shareholder's shareholding has an effect on investment (Rao and Wang, 2006) and that majority state ownership is likely to cause

[4] A minority of SOE CEOs can go into politics or take positions in private enterprises, which gives them similar career concern incentives to work in SOEs. However, most will not do so, with only 2% turning to private enterprises (Wan and Chen, 2012). Hence, we do not consider the influence of post-retirement employment on investment.

excessive investment, whereas the proportion of tradable shares can curb it (Xu and Zhang, 2009). Dou et al. (2011) find excessive investment behavior to be mitigated when firms are under the control of multiple large shareholders, if mutual supervision exists among them. Thus, in the case of state-owned controlling shareholders, equity restrictions help to reduce excessive investment and improve investment efficiency. The CEO of the firm is assigned by the state-owned controlling shareholder (Group) and thus there is always a strong internal control feature. If CEOs make inefficient investments before retirement, the controlling shareholders (Groups) find it difficult to engage in effective supervision. As an alternative mechanism, in the presence of equity restrictions, the other shareholders must be able to effectively restrain those inefficient investments for their own interests. Conversely, if equity restrictions are lacking, the other shareholders cannot restrict the large shareholders' decisions effectively and cannot supervise CEOs' investment behavior before retirement, thus resulting in a significant decline in investment efficiency.

Accordingly, we propose Hypothesis 2: In the absence of equity restrictions, business investment and efficiency decline significantly when SOE CEOs are close to retirement.

4. Research design

4.1. Research design and sample selection

The main issue of interest in the study is whether the investment efficiency of SOEs declines significantly just before the retirement of their CEOs.[5] The research sample thus comprises "retirement" firms with a CEO is in his/her retirement term during the research period,[6] and the control sample comprises "severance" firms with a CEO that leaves office but does not retire.[7] To ensure the comparability of the research and control samples, the two sets of firms are matched by industry and size. Retirement term, pre-retirement term, departure term and pre-departure term are determined as follows. If a CEO aged 58–61 leaves office after his/her tenure, he/she enters the retirement term category, the term before it enters the pre-retirement term category. If no CEOs are facing retirement, the severance term is chosen, and the term before it is chosen as the pre-severance term. Both the retirement and severance terms are named as outgoing terms, and both the pre-retirement and pre-severance terms are named as pre-outgoing terms. The recording of in-office CEOs begins in 1999. Because the global financial crisis that began in 2008 is likely to have exerted considerable effects on both the investment level and efficiency of SOEs, the sample period ends in 2007.

To ensure the robustness of the conclusions in this paper, firms with missing values for investments, growth opportunities, operating cash flow, firm size and CEO age are excluded from the sample. The final sample consists of panel data from 256 listed SOEs and 1,174 firm-years. The research sample comprises 128 companies and 582 firm-years, and the control sample 128 companies and 592 firm-years. The observations for different years are relatively balanced. At 75 firms, 1999 contains the fewest; and at 169 firms, 2003 contains the most. Industry classification is based on the Industry Classification Guidance for Listed Companies issued by the China Securities Regulatory Commission in 2001. Because the manufacturing industry includes many listed firms and there are big differences between second-level classification companies, manufacturing companies are classified by their second-level classification and all other industries are classified according to their first-level classification. The industry distribution of the sample is representative, with sample firms representing 19 of the 22 industries. The machinery, equipment, and instrumentation industry accounts for the largest number of firms (240), followed by the metal and non-metal industries (167) and the petroleum, chemical and plastics industries (133). Other

[5] Both chairperson and general manager are taken as CEO for our research purpose, so either of them facing retirement in SOEs will be included in our research sample.

[6] Retirees who are over the age of 61 when they left office are excluded. Because the statutory retirement age is 60, if a CEO/chair candidate is 57 years old, he/she can remain in position for an additional term, but must retire if he/she is 58 years old. Hence, the retirement age will be no more than 61 years old. If a CEO does not retire at that age, then the company may be special in some way, and was thus deemed inappropriate for inclusion in the research sample.

[7] A decline in investment efficiency caused by outgoing CEOs may also exist in the severance sample, and thus including a control sample based on outgoing non-retiring CEOs helps to control for the general influence of outgoing CEOs on investment efficiency.

manufacturing (7), agricultural (8), and communication and culture (15) are the industries with the fewest observations.

4.2. Model selection and variable measurement

According to the classical investment literature, if a company's investments and growth opportunities are positively correlated, its investments are deemed efficient (Tobin, 1969; Hayashi, 1982; Hubbard, 1998). Durnev et al. (2004) and Chen et al. (2006) follow this body of literature in their study of investment efficiency. They measure companies' growth opportunities with Tobin's Q and investigate the influence of share price information and the sensitivity of share prices on companies' investment efficiency. With reference to these studies and the models therein, the current study investigates the influence of incentive rigidity on investment efficiency by examining the effects of CEO retirement on a company's investments and the sensitivity of its share prices (Tobin's Q). Since Fazzari et al. (1988), a large body of empirical research has shown that a company's operating cash flow is an important corporate investment decision factor. Accordingly, in this study, we control for operating cash flow as a possible influential factor in a firm's investment decisions.

In accordance with the previous literature and the needs of the study, we use the following variables. $Inv_{i,t}$, a proxy for investment, is calculated by "cash outflows on the purchase and construction of fixed assets, intangible assets and other long-term assets" plus "net cash flows on the acquisition of subsidiaries or other operating units," minus "net cash flows on the disposal of fixed assets, intangible assets and other long-term assets," minus "net cash flows on the disposal of subsidiaries and other business units," minus the total sum of "fixed asset depreciation, the depletion of oil and gas assets and productive biological assets," "the amortization of intangible assets," and "the amortization of long-term unamortized expenses" divided by total assets. All of the company investments considered are additional investments in long-term assets. As Hao et al. (2010) point out, fixed assets, intangible assets, equity and R&D investments may be tools that the major shareholder or CEOs can use to obtain private benefits. The total investment amount contains both ongoing and additional investments. As ongoing investments are a prerequisite for the maintenance of existing value, whereas additional investments are the core of future company growth, the latter is the main study object in this research. $RetireFirm_{i,t}$ represents a firm in the retirement sample. If the CEO of the sample firm retires in the sample period, the variable takes a value of 1, and 0 otherwise. $Leave_{i,t}$ represents an outgoing CEO. For both the retirement and severance samples, if a CEO leaves office after his/her tenure, the variable takes a value of 1 and 0 otherwise.

$TobinQ_{i,t-1}$ stands for growth opportunities[8] calculated by (market value of tradable shares + Net assets × the proportion of non-tradable shares + book value of liabilities)/(Net assets + book value of liabilities). The book value of liabilities is the total sum of short-term loans, long-term loans and bonds payable. All of the data are from the beginning of the year. $Cashflow_{i,t-1}$ stands for operating cash flow and is calculated by "net cash flow from operating activities" divided by the opening amount of total assets. $Size_{i,t-1}$ stands for firm size calculated by the natural logarithm of the opening amount of total assets. $Inv_{i,t-1}$ stands for lagged investment, which is used to control for the influence of investment stickiness on current period investments. $Lev_{i,t-1}$ is the lagged debt ratio and controls for the influence of financial structure. Finally, $Balance_{i,t-1}$ is the proportion of the shares held by the second largest shareholder group relative to those held by the largest group, and is included to control for the influence of equity restrictions.[9]

[8] Sales growth is a commonly used proxy variable for measuring investment opportunity. However, in this study, sales growth may be endogenous to investment (for example, overinvestment by CEOs who are in their retirement term may lead to a higher level of sales growth), and its use was therefore inappropriate.

[9] Theoretically, local GDP, whether a firm's external auditor is one of the Big Four or one of China's Big Ten, and other corporate governance variables may also affect a firm's investments and the efficiency of those investments. However, this study does not adopt them as control variables because local GDP is more likely to reflect the local investment level rather than investment efficiency. At the same time, because this study is interested in the difference between firms, the difference between districts is absorbed. External audits and other corporate governance variables can reflect differences in corporate governance, but lack adequate empirical evidence for the exogenous nature and effectiveness of governance, particularly when it comes to investment efficiency. Here, the focus is on retirement and the influence of equity restrictions on investment efficiency. The role of corporate governance mechanisms is a potential direction for future research.

A positive coefficient of $\text{TobinQ}_{i,t-1}$ indicates that the investments of a sample firm are efficient. The focus of the study reported herein is on whether the investment efficiency of CEOs in the retirement sample ($\text{RetireFirm}_{i,t}$) is significantly lower than that of their counterparts in the severance sample, i.e., whether the sign of $\text{RetireFirm}_{i,t} \times \text{Leave}_{i,t} \times \text{TobinQ}_{i,t-1}$ is significantly negative. For model completeness, the interactions of these three variables, i.e., $\text{RetireFirm}_{i,t} \times \text{TobinQ}_{i,t-1}$, $\text{Leave}_{i,t} \times \text{TobinQ}_{i,t-1}$, and $\text{RetireFirm}_{i,t} \times \text{Leave}_{i,t}$, are also controlled. The regression model used in this study is as follows.

$$\begin{aligned} Inv_{i,t} = {} & \alpha + \beta_1 * \text{TobinQ}_{i,t-1} + \beta_2 * \text{RetireFirm}_{i,t} + \beta_3 * \text{Leave}_{i,t} + \beta_4 * \text{RetireFirm}_{i,t} * \text{TobinQ}_{i,t-1} + \beta_5 \\ & * \text{Leave}_{i,t} * \text{TobinQ}_{i,t-1} + \beta_6 * \text{RetireFirm}_{i,t} * \text{Leave}_{i,t} + \beta_7 * \text{RetireFirm}_{i,t} * \text{Leave}_{i,t} * \text{TobinQ}_{i,t-1} \\ & + \beta_8 * \text{Balance}_{i,t-1} + \beta_9 * \text{Cashflow}_{i,t-1} + \beta_{10} * \text{Lev}_{i,t-1} + \beta_{11} * \text{Inv}_{i,t-1} + \beta_{12} * \text{Size}_{i,t-1} \\ & + \Sigma_i \text{Industry}_i + \Sigma \lambda_i \text{Year}_i + U_{i,t} \end{aligned}$$

To avoid the influence of industry-year factors on variable measurement, $\text{Inv}_{i,t}$, $\text{Inv}_{i,t-1}$, $\text{TobinQ}_{i,t-1}$, $\text{Lev}_{i,t-1}$, $\text{Size}_{i,t-1}$ and $\text{Cashflow}_{i,t-1}$ are adjusted by their industry-year medians. In addition, to avoid the influence of extreme values, all variables are winsorized at the 1% level. All data are obtained from the CSMAR database, except that data on ultimate controlling shareholders are hand collected.

5. Empirical results and analysis

5.1. Descriptive statistics and correlation of variables

Table 1 lists the descriptive statistics of the variables for the 1,174 firm-years. It shows that investment to total assets ($\text{Inv}_{i,t}$) has a mean (median) of 3.9% (1.4%) and a standard deviation of 9.2%, which means there are considerable differences among the investment levels of the sample firms. The outgoing term subsample ($\text{Leave}_{i,t} = 1$) accounts for around 53% of firm-years and the retirement subsample ($\text{RetireFirm}_{i,t} = 1$) around 50%.

Table 2 indicates that investment is highly positively correlated with growth, operating cash flow, and lagged investment, with correlation coefficients of 12%, 21% and 45% respectively, and is significantly negatively correlated with financial leverage (correlation coefficient is −14%), which is consistent with the previous literature (e.g., Fazzari et al., 1988; Chen et al., 2006). $\text{Leave}_{i,t}$ is negatively correlated with investment (coefficient of 1.5%; insignificant), which shows that firm investment increases when a CEO is about to leave office, but not to a statistically significant extent. $\text{RetireFirm}_{i,t}$ is positively related to investment (coefficient is 5%, significant at the 10% level), which means the investment level of the retirement sample is significantly higher than that of the severance sample.

Fig. 1 reveals the influence of retirement (severance) on investment efficiency by comparing efficiency in the retirement (severance) term and pre-retirement (pre-severance) term subsamples. It shows that the investment efficiency of the retirement sample is 23.3% in the pre-retirement term, declining to −7.2% in the retirement term, for a difference of 30.5%. In the severance sample, in contrast, investment efficiency declines from 17.8% to 15.6%, a difference of just 2.1%. We can thus infer that CEOs who are close to retirement significantly reduce a company's investment efficiency. These results provide preliminary support for Hypothesis 1.

Table 1
Main variables and summary statistics.

Variables	Mean	Median	Std.	1% percentile	99% percentile
$\text{Inv}_{i,t}$	0.039	0.014	0.092	−0.081	0.368
$\text{Leave}_{i,t}$	0.526	1	0.5	0	1
$\text{RetireFirm}_{i,t}$	0.496	0	0.5	0	1
$\text{Balance}_{i,t-1}$	0.216	0.084	0.263	0.002	0.958
$\text{TobinQ}_{i,t-1}$	1.562	1.408	0.673	0.864	3.746
$\text{Cashflow}_{i,t-1}$	0.07	0.058	0.151	−0.169	0.389
$\text{Lev}_{i,t-1}$	0.457	0.448	0.194	0.096	0.888
$\text{Inv}_{i,t-1}$	0.073	0.05	0.082	−0.041	0.4
$\text{Size}_{i,t-1}$(in 100 millions)	21.333	21.259	0.932	19.342	23.673

Table 2
Pearson and Spearman correlation coefficients.

	$Inv_{i,t}$	$Leave_{i,t}$	$RetireFirm_{i,t}$	$TobinQ_{i,t-1}$	$Cashflow_{i,t-1}$	$Balance_{i,t-1}$	$Lev_{i,t-1}$	$Inv_{i,t-1}$
$Leave_{i,t}$	0.015							
	(0.614)							
$RetireFirm_{i,t}$	0.048*	0.021						
	(0.099)	(0.474)						
$TobinQ_{i,t-1}$	0.120***	0.021	−0.028					
	(<0.01)	(0.464)	(0.346)					
$Cashflow_{i,t-1}$	0.211***	−0.019	0.057**	0.096***				
	(<0.01)	(0.509)	(0.050)	(<0.01)				
$Balance_{i,t-1}$	−0.045	0.007	−0.082***	0.081***	−0.077***			
	(0.122)	(0.818)	(<0.01)	(<0.01)	(<0.01)			
$Lev_{i,t-1}$	−0.144***	0.033	−0.073**	−0.104***	−0.099***	0.033		
	(<0.01)	(0.266)	(0.012)	(<0.01)	(<0.01)	(0.256)		
$Inv_{i,t-1}$	0.446***	0.021	0.064**	0.036	0.105***	−0.045	−0.084***	
	(<0.01)	(0.475)	(0.029)	(0.224)	(<0.01)	(0.124)	(<0.01)	
$Size_{i,t-1}$	0.019	0.056*	0.098***	−0.268***	0.073**	−0.071**	0.145***	0.108***
	(0.521)	(0.057)	(<0.01)	(<0.01)	(0.013)	(0.015)	(<0.01)	(<0.01)

Note: Below the parameter estimates are *t*-values (already heteroskedasticity-adjusted according to White (1980)).
* The parameter estimates indicate the level of statistical significance: that the parameter estimates are significant at the 10% level (two-tailed test).
** The parameter estimates indicate the level of statistical significance: that the parameter estimates are significant at the 5% level (two-tailed test).
*** The parameter estimates indicate the level of statistical significance: that the parameter estimates are significant at the 1% level (two-tailed test).

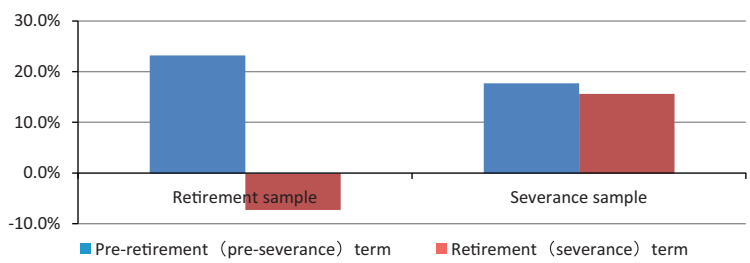

Figure 1. Time-series differences investment efficiency.

5.2. Regression results and analysis: full sample

The first column of Table 3 lists the regression results for the retirement and severance samples. The coefficient of $TobinQ_{i,t-1}$ is 0.012 (significant at the 1% level), which means that the greater the growth opportunities, the more investments there are and the greater the overall investment efficiency of the SOE in question. It also means that increases (decreases) of one standard deviation lead to increases (decreases) of 1% in investments ($Inv_{i,t}$), which equals a quarter of investment's mean value (3.9%). The implication is that investment efficiency, which is measured by the sensitivity of investment opportunities, is economically significant. The coefficient of $RetireFirm_{i,t}$ is 0.003, indicating that the retirement sample has an insignificantly higher investment level than the severance sample (approximately 7.6% of the mean value). Hence, we can conclude that there are no big differences between the retirement and severance samples, thereby excluding the possibility that the results presented herein are the result of biased sample selection. The coefficient of $Leave_{i,t}$ is 0.001, indicating that the investment level increases slightly for outgoing CEOs, but not to a significant extent either statistically or economically. Hence, outgoing CEOs, in general, do not significantly influence the

Table 3
Regression results for full sample (OLS model).

Dependent variable: $Inv_{i,t}$			
	(1) Full sample	(2) Retirement sample	(3) Severance sample
$TobinQ_{i,t-1}$	0.012***	0.015**	0.013***
	(3.30)	(2.43)	(3.62)
$Leave_{i,t}$	0.001	−0.001	−0.000
	(0.25)	(−0.23)	(−0.04)
$RetireFirm_{i,t}$	0.003		
	(0.38)		
$Leave_{i,t} \times TobinQ_{i,t-1}$	0.001	−0.025***	0.002
	(0.18)	(−2.94)	(0.32)
$Leave_{i,t} \times RetireFirm_{i,t}$	−0.006		
	(−0.59)		
$RetireFirm_{i,t} \times TobinQ_{i,t-1}$	0.004		
	(0.61)		
$Leave_{i,t} \times RetireFirm_{i,t} \times TobinQ_{i,t-1}$	−0.027**		
	(−2.45)		
$Balance_{i,t-1}$	−0.007	−0.007	−0.008
	(−0.90)	(−0.48)	(−0.86)
$Cashflow_{i,t-1}$	0.132***	0.133**	0.133***
	(4.01)	(2.54)	(3.92)
$Lev_{i,t-1}$	−0.032***	−0.040**	−0.023
	(−2.82)	(−2.17)	(−1.62)
$Inv_{i,t-1}$	0.446***	0.381***	0.505***
	(11.56)	(7.26)	(9.14)
$Size_{i,t-1}$	−0.001	−0.005	0.004
	(−0.25)	(−1.41)	(0.93)
Observations	1,174	1,174	
Adj. R2	24.8%	25.2%	

Note: Below the parameter estimates are *t*-values (already heteroskedasticity-adjusted according to White (1980)).
OLS = ordinary least squares. * The parameter estimates indicate the level of statistical significance, i.e., that the parameter estimates are significant at the 10% level (two-tailed test).
** The parameter estimates indicate the level of statistical significance, i.e., that the parameter estimates are significant at the 5% level (two-tailed test).
*** The parameter estimates indicate the level of statistical significance, i.e., that the parameter estimates are significant at the 1% level (two-tailed test).

investment level. The coefficients of both $Leave_{i,t} \times RetireFirm_{i,t-1}$ and $Leave_{i,t} \times TobinQ_{i,t-1}$ approach 0, which indicates that, compared with former tenure, neither investment level nor investment efficiency decrease significantly, thereby precluding the possibility that the study was influenced by the outgoing CEO factor. The coefficient of $RetireFirm_{i,t} \times TobinQ_{i,t-1}$ is only 0.001, which means that an increase (decrease) in investment level brought by one standard deviation of $TobinQ_{i,t-1}$ is 0.1% higher in the retirement sample, an increase too small to reach statistical significance. We can thus conclude that there are no significant differences in investment efficiency between the retirement and severance samples and that the retirement sample does not suffer from sample selection bias. If our prediction that investment efficiency declines in the retirement term holds, then that decline can be taken to result from the lack of incentives arising from the rigidness of compensation contracts and retirement problems in Chinese SOEs.

The coefficient of the study's main variable, i.e., $RetireFirm_{i,t} \times Leave_{i,t} \times TobinQ_{i,t-1}$, is −0.027 and significant at the 1% level, which indicates that, compared with severance companies, retirement companies' investment efficiency decreased significantly in the outgoing term of their general managers. Economically, the investment efficiency of the severance companies during their executives' severance term is the sum of $TobinQ_{i,t-1}$ and $Leave_{i,t} \times TobinQ_{i,t-1}$, that is, 0.013, and its economic meaning is the same as the coefficient of $TobinQ_{i,t-1}$. The investment efficiency of the retirement companies during the retirement term should be the sum of $TobinQ_{i,t-1}$, $Leave_{i,t} \times TobinQ_{i,t-1}$, and $RetireFirm_{i,t} \times Leave_{i,t} \times TobinQ_{i,t-1}$, that is, −0.012. In

other words, a one standard deviation[10] in investment opportunities ($TobinQ_{i,t-1}$) increases (decreases) investments ($Inv_{i,t}$) by 1.1%, which is equal to 28% of investment's mean value. Investments and investment opportunities change inversely, and the change is economically significant. The implication is that investments remain efficient during the severance term of companies, but are inefficient during the retirement term of companies. Columns 2 and 3 of Table 3 present the regression results of the retirement and severance samples separately. They are consistent with the regression results for the full sample. Moreover, in the separate regressions, the coefficient of $Leave_{i,t} \times TobinQ_{i,t-1}$ is significant at the 5% level, which further verifies the credibility of the results presented above. Taken together, our results indicate that a lack of incentives resulting from the rigidity of compensation contracts and retirement problems leads to decreases in investment efficiency and that these decreases do not arise from the outgoing CEO factor or sample selection bias.

In the regression of the full sample, the coefficient of the control variable $Cashflow_{i,t-1}$ is 0.132 (significant at the 1% level), which means a company's operating cash flow exerts a significant influence on its investment level. Further, a one standard deviation change in $Cashflow_{i,t-1}$ leads to an investment change of 1.3% (which equals 33% of the mean value), which is significant both statistically and economically. The coefficient of $Lev_{i,t-1}$ is −0.032 (significant at the 1% level), meaning that more highly leveraged companies are less likely to invest. A one standard deviation change in $Lev_{i,t-1}$ leads to a 2.8% change in investments, which is both statistically and economically significant. The coefficient of $Inv_{i,t-1}$ is 0.446 (significant at the 1% level), which suggests that investments are sticky. A one standard deviation change in $Inv_{i,t-1}$ leads to a 3.3% change in investments, which is significant both statistically and economically. The results of the foregoing variables are the same as those in Chen et al. (2006) and Xin et al. (2007).

5.3. Influence of equity restrictions

Chen and Wang (2004) and Tang et al. (2005) find that the second largest shareholder in a firm can restrict entrenchment and other opportunistic behavior by the largest shareholder. Based on data of the ten largest shareholders, Hong and Xue (2008) further define the first and second largest shareholder groups, and investigate how the second largest shareholder group suppresses the opportunistic behavior of the first. Dou et al. (2011) find that, conditional upon a number of large shareholders jointly controlling a firm, if those shareholders mutually supervise one another, overinvestment behavior is alleviated. In this paper, we argue that the closer the proportion of shares held by the second largest shareholder group relative to the largest shareholder, the greater the former's power to supervise the latter and the more likely they are to supervise the CEOs appointed by the latter. Accordingly, to further test Hypothesis 2, we use the proportion of shares held by the second largest shareholder group to those held by the largest group as a proxy for equity restrictions (denoted $Balance_{i,t-1}$). To avoid the endogenous effect of outgoing CEOs on investment efficiency and equity restrictions, we use the mean of a company's pre-outgoing term (denoted $Balance\_Mean_{i,t-1}$) as the basis for calculating the median ($Balance\_Median_{i,t-1}$). If $Balance\_Mean_{i,t-1} \geqslant Balance\_Median_{i,t-1}$, the company's equity restrictions are considered to be strong, and otherwise weak.[11]

Table 4 presents the results by group. In the low equity restriction group, the coefficient of $RetireFirm_{i,t} \times Leave_{i,t} \times TobinQ_{i,t-1}$ is −0.043 (significant at the 1% level), indicating that, compared with a severance company, a retirement company's investment efficiency decreases significantly in the retirement term relative to the pre-retirement term. In the high equity restriction group, the coefficient of $RetireFirm_{i,t} \times Leave_{i,t} \times TobinQ_{i,t-1}$ is 0.011, indicating that compared with the severance sample, investment efficiency in the retirement sample experienced no significant decline when CEOs are in their retirement term rather than the pre-retirement term. The difference between the foregoing coefficients was 5.4%, and an *F*-test shows the difference to be significant at the 1% level. These results validate Hypothesis 2, which posits

[10] Because the variables in the regression model were already median-adjusted, when calculating significance (standard deviations of correspondent coefficients × independent variables), we adopt the standard deviations after median-adjustment rather than those before, as in Table 1. The standard deviation of Tobin's Q is 0.91 in the regression sample.

[11] As the actual controlling shareholding data in the CSMAR database begin from 2003, we replace data before 2003 with data for 2003. Although this missing data may have introduced some degree of bias, it is more likely to be "biased against" the results reported in this paper.

Table 4
Regression results grouped by equity restriction level (OLS model).

Dependent variable: $Inv_{i,t}$		
	(1) Equity restriction ⩾ median	(2) Equity restriction < median
$TobinQ_{i,t-1}$	0.014**	0.010***
	(2.05)	(2.64)
$Leave_{i,t}$	−0.003	0.006
	(−0.38)	(0.72)
$RetireFirm_{i,t}$	−0.002	0.008
	(−0.27)	(0.91)
$Leave_{i,t} \times TobinQ_{i,t-1}$	−0.010	0.012
	(−1.25)	(1.14)
$Leave_{i,t} \times RetireFirm_{i,t}$	0.010	−0.017
	(0.82)	(−1.37)
$RetireFirm_{i,t} \times TobinQ_{i,t-1}$	0.003	0.006
	(0.26)	(0.64)
$Leave_{i,t} \times RetireFirm_{i,t} \times TobinQ_{i,t-1}$	0.011	−0.043***
	(0.77)	(−2.91)
$Cashflow_{i,t-1}$	0.138***	0.125***
	(2.76)	(2.92)
$Lev_{i,t-1}$	−0.039**	−0.025*
	(−2.11)	(−1.79)
$Inv_{i,t-1}$	0.440***	0.448***
	(8.07)	(8.25)
$Size_{i,t-1}$	0.001	−0.001
	(0.27)	(−0.39)
Observations	1,174	
Adjusted R-squared	24.9%	

Note: Below the parameter estimates and those in parentheses are *t*-values (heteroskedasticity-adjusted according to White (1980)).
* The parameter estimates indicate the level of statistical significance: that the parameter estimates are significant at the 10% level (two-tailed test).
** The parameter estimates indicate the level of statistical significance: that the parameter estimates are significant at the 5% level (two-tailed test).
*** The parameter estimates indicate the level of statistical significance: that the parameter estimates are significant at the 1% level (two-tailed test).

that weaker equity restrictions reduce large shareholders' ability to supervise CEOs effectively, and thus the investment efficiency decline arising from incentive contract rigidity cannot be reduced.

In summary, the enforced retirement of SOE CEOs result in incentive contract rigidity, and the loss of contract efficiency results in a decline in investment efficiency. Further investigation shows the consequences of a rigid incentive contract to vary by shareholder supervision. When equity restrictions are stronger, the second largest shareholder groups have relatively stronger power to restrict the largest shareholder, which helps to strengthen the supervision on CEOs and compensate for a lack of flexibility in retirement term incentive contracts. Accordingly, in this case, there is no significant decline in investment efficiency. If, in contrast, non-ultimate controllers' supervisory power is insufficient to make up for the reduced efficiency arising from incentive contract rigidity, the result is a significant decline in investment efficiency.

5.4. Further discussion and sensitivity analysis

If the retirement of CEOs causes a decline in investment efficiency, are there any differences between central and local SOEs, whose ultimate controllers are the central and local government, respectively? In this paper, we argue that, on the one hand, the supervision of central SOE shareholders may be stronger because of the government's policy to "retain the large, release the small," thereby alleviating the decline in investment efficiency caused by CEOs' retirement. On the other hand, because of the monopoly position of central enterprises and their greater reliance on administrative means, the market compensation mechanism is more likely to exist in local SOEs than in central SOEs, thereby leading to greater compensation rigidity in central

SOEs and hence greater managerial myopia and a more severe decline in retirement-induced investment efficiency. The answer depends on which influence dominates. The results presented in this paper primarily support the latter prediction (although the difference between central and local SOEs is statistically insignificant). In other words, the retirement of CEOs in central SOEs may lead to a decline in investment efficiency because of the salary rigidity in these SOEs.[12]

The overinvestment model in Richardson (2006), the most commonly used empirical research model at present, influences the study reported herein in the following ways. First, the establishment of the optimal investment level had the preconditions of no information asymmetry or agency problems. However, when estimating additional investments, with the exception of the investment opportunity variables, the variables caused the estimates of expected investments to deviate from the theoretically optimal investment level. The estimated optimal investment level includes a return variable. Accordingly, if the market expects enterprises with managerial retirement issues to suffer more severe agency problems, it will underestimate the theoretically optimal investment level, and thus overestimate overinvestment or underestimate underinvestment. Second, the model includes one-period-lagged investments. Because the outgoing term is related to three consecutive years, if overinvestment exists in the first year, overinvestments in previous years are taken as the normal level in estimating overinvestment in subsequent years, thus leading to underestimation of subsequent years' overinvestment, which is detrimental to the accuracy of the research results. We use the Tobin's Q model in this study to investigate the sensitivity coefficient between investments and investment opportunities, which is not affected by the aforementioned factors.

To ensure the reliability of our conclusions, we perform the following sensitivity analyses, which result in no changes to the main conclusions. First, in the measurement of Tobin's Q, we calculate the market value of equity by all shares multiplied by the share price, and the market/book value of liabilities including all liabilities rather than just including loans and bonds. Second, we group companies according to power by the proportion of the second largest shareholder groups' shareholding relative to that of the largest shareholder, dividing the groups by 20% and 50% rather than by the sample median. Third, we identify the equity structure by calculating the total shareholding of the second- to fifth-largest shareholder groups divided by the shareholding of the largest shareholder group. Fourth, in accordance with Milnor and Shapley (1978), we calculated the Shapley index of different largest shareholder groups, and grouped companies according to the sum of the Shapley index of the second- to tenth-largest shareholder groups divided by that of the largest shareholder group. Finally, we carried out regressions on outgoing chairpersons and general managers separately.

6. Conclusions

This paper theoretically analyzes how career concerns and shareholder monitoring affect CEO agency costs. Efficient compensation contracts help to reduce agency costs, but a lack of incentives owing to imminent retirements cannot be remedied by adjusting compensation contracts because of the constraints imposed by contract rigidity in the Chinese SOE context. Shareholder monitoring as an internal governance mechanism helps to alleviate agency costs, particularly when incentives are insufficient, and contract efficiency can be improved to some extent through shareholder monitoring. In Chinese SOEs, compensation contracts suffer rigidity, and the problem of managerial myopia is exacerbated by the retirement-age regulation. Empirical analysis of these issues is of both theoretical and practical significance.

This paper reports the empirical results of systematic examination of the effects of rigid compensation contracts on firms' investment efficiency based on a sample of Chinese A-share listed companies from 1999 to 2007. The results reveal a significant decrease in investment efficiency in the retirement term of the CEO relative to the previous term. However, stronger shareholder monitoring can effectively restrict the agency problems of CEOs approaching retirement, thereby improving investment efficiency.

This paper is of theoretical significance. In Chinese SOEs, promotion opportunities or the possibility of staying on constitute important incentives for executives because the private benefits of control arising from

[12] To save space, this paper does not report the relevant results, but they are available from the authors upon request.

promotion (or staying on) can compensate for the lack of other forms of explicit or implicit compensation. The incentive contracts in SOEs remain optimal despite compensation regulations. However, promotion incentives decline as CEOs approach retirement and compensation contract rigidity induces greater agency costs and diminishes investment efficiency in the retirement term. In the presence of compensation contract rigidity, shareholder monitoring can serve as an effective alternative mechanism.

The paper is also of practical significance. One of the most important topics in SOE reform is the demand to establish and improve incentive and monitoring systems. We currently lack sufficient empirical evidence to determine whether shareholder monitoring can improve contract and investment efficiency in the face of compensation contract rigidity, and thus reduce agency costs. The results reported herein show that compensation contract rigidity increases agency costs, although shareholder monitoring can alleviate these costs, thereby improving contract efficiency and enhancing firm competitiveness. The debate over the demand for a more flexible retirement system in Chinese SOEs has become increasingly fierce in recent years and this paper adds supporting evidence for the requirement for greater flexibility. Implementing a more flexible retirement system may help to strengthen the efficiency of incentive contracts and decrease the agency costs induced by compensation contract rigidity.

Acknowledgments

This paper received support from the National Natural Science Foundation of China (Nos. 70972060, 71102013 and 71272008), National Accounting Leader (Reserve) Personnel Training Plan (Academic Class), Humanities and Social Science Research Foundation of the Ministry of Education of China (Nos. 11JJD790008, 13YJC790041 and 14JJD630005), Innovation Program of the Shanghai Municipal Education Commission (Nos. 11ZS186 and 14ZS157) and the "Shu Guang" project supported by the Shanghai Municipal Education Commission and Shanghai Education Development Foundation (No. 10SG54). It is also included in the "211" Key Project of the Shanghai University of Finance and Economics. We owe many thanks to Prof. Bin Ke (Nanyang Technological University) and Prof. Hongjun Zhu (Shanghai University of Finance and Economics) for their enlightening advice. Nevertheless, we three co-authors take full responsibility for the paper. We also gratefully acknowledge Junzi Zhang (Lancaster University) for her assistance in data collection and excellent work in general.

References

Bliss, R., Rosen, R., 2001. CEO compensation and bank mergers. J. Financial Econ. 61, 107–138.

Brickley, J.A., Linck, J.S., Coles, J.L., 2006. What happens to CEOs after they retire? New evidence on career concerns, horizon problems, and CEO incentives. J. Financial Econ. 52 (3), 341–377.

Chen, D., 2003. A study and analysis on local government, corporate governance: empirical evidence from subsidy in China. J. Finance Econ. 29 (9), 15–21 (in Chinese).

Chen, S., Clark, R.L., 1994. Management compensation and payback method in capital budgeting: a path analysis. Acc. Bus. Res. 24 (94), 121–132.

Chen, Z., Li, Y., 2011. Marketization process, characteristics of the enterprise and executive pay-performance sensitivity. Finance Trade Res. 6, 133–143 (in Chinese).

Chen, X., Wang, H., 2004. Equity restrictions and firm value: model and empirical evidences. Quant Tech. Econ. 11, 102–110 (in Chinese).

Chen, D., Chen, X., Wan, H., 2005. Regulation and non-pecuniary compensation in Chinese SOEs. Econ. Res. J. 2, 92–101 (in Chinese).

Chen, Q., Goldstein, I., Jiang, W., 2006. Price informativeness and investment sensitivity to stock price. Rev. Financial Stud. 20 (3), 619–650.

Cheng, S., 2004. R&D expenditures and CEO compensation. Acc. Rev. 79 (2), 305–328.

Choe, C., 2006. Optimal CEO compensation: some equivalence results. J. Labor Econ. 24 (1), 171–201.

Corporate Governance Evaluation Team within Corporate Governance Research Center of Nankai University, 2004. Strong Controlling Shareholder and Weak Board. China Entrepreneur 3, pp. 126–128. (in Chinese).

Dechow, P., Sloan, R., 1991. Executive incentives and the horizon problem: an empirical investigation. J. Acc. Econ. 14, 51–89.

Demougin, D., Fluet, C., 2001. Monitoring versus incentives. Eur. Econ. Rev. 45 (9), 1741–1764.

Dou, W., Liu, X., An, L., 2011. Ownership concentration, allocation of control rights and inefficient investment in firms: monitoring or colluding among multiple large shareholders? J. Manage. Sci. 11, 81–96 (in Chinese).

Durnev, A., Morck, R., Yeung, B., 2004. Value-enhancing capital budgeting and firm-specific stock return variation. J. Finance 59 (1), 65–105.

Fama, E.F., 1980. Agency problem and the theory of the firm. J. Polit. Econ. 88, 288–307.

Fang, Y., Xia, L., Zhu, J., 2007. Can management turnover improve firm performance? Empirical research on corporate governance efficiency of firms with poor performance. China Acc. Finance Rev. 1, 1–45 (in Chinese).
Fazzari, S.M., Hubbard, R.G., Petersen, B.C., Blinder, A.S., Poterba, J.M., 1988. Financial Constraints and Corporate Investment. Brookings Pap. Econ. Act. 1988 (1), 141–206.
Firth, M., Fung, P.M.Y., Rui, O.M. 2002. Firm Performance, Governance Structure and Top Management Turnover in Chinese Listed Firms, Working Paper.
Gibbons, R., Murphy, K.J., 1992. Optimal incentive contracts in the presence of career concerns: theory and evidence. J. Polit. Econ. 100 (3), 468–505.
Hao, Y., Liu, X., Lin, Z., 2010. Snatching private benefit of control with capital investment: comment and discussion. Manage. Rev. 2, 109–120 (in Chinese).
Hayashi, F., 1982. Tobin's marginal and average Q: a neoclassical interpretation. Econometrica 50 (1), 213–224.
Holmström, B., 1999. Managerial incentive problems: a dynamic perspective. Rev. Econ. Stud. 66 (1), 169–182.
Hong, J., Xue, H., 2008. The effect of equity restrictions on the amount of related party transactions and the consistence of related party sales. Nankai Bus. Rev. 1, 24–30 (in Chinese).
Hubbard, R.G., 1998. Capital-market imperfections and investment. J. Econ. Lit. 36, 193–225.
Jensen, M., Meckling, W., 1976. Theory of the firm: managerial behavior, agency costs and ownership structure. J. Financial Econ. 32 (3), 305–360.
Jensen, M., Murphy, K., 1990. Performance pay and top-management incentives. J. Polit. Econ. 98, 225–264.
Larcker, D.F., 1983. The Association between performance plan adoption and corporate and capital investment. J. Acc. Econ. 4, 3–30.
Lewellen, W.G., Loderer, W.D., Rosenfeld, A., 1985. Merger decisions and executive stock ownership. J. Acc. Econ. 4, 209–231.
Li, Y. 2012, June 7. Raising Retirement Age is An Inevitable Choice. Oriental Morning Post A04. (in Chinese).
Liu, X., 2001. China Enterprise Development Report: 1990–2000. Social Science Academic Press, Beijing, China (in Chinese).
Lv, C.J., Zhao, Y., 2008. A Study on the effect of the incentive given to managers of state-owned enterprises. Manage. World 11, 99–109 (in Chinese).
McConnell, J., Servaes, H., 1990. Additional evidence on equity ownership and corporate value. J. Financial Econ. 27, 595–612.
Milnor, J.W., Shapley, L.S., 1978. Value of large games 2: oceanic games. Math. Oper. Res. 3 (4), 290–307.
Minnick, K., Haluk, U., Liu, Y., 2011. Pay for performance? CEO compensation and acquirer returns in BHCs. Rev. Financial Stud. 24, 439–473.
Morck, R., Shleifer, A., Vishny, R., 1990. The Stock Market and Investment: Is The Market a Side-Show?, vol 2. Brookings Papers on Economic Activity.
Rao, Y., Wang, Y., 2006. Large shareholders' effect on corporate investment: evidence from China listed companies. Nankai Bus. Rev. 5, 67–73 (in Chinese).
Richardson, S., 2006. Over-investment of free cash flow. Rev. Acc. Stud. 11, 159–189.
Shleifer, A., Vishny, R.W., 1989. Management entrenchment: the case of managerial specific investments. J. Financial Econ. 25 (3), 123–139.
Tang, Q., Luo, D., Wang, L., 2005. Controlling shareholder's tunneling and resistant powers: evidence from the Chinese stock market. China Acc. Rev. 1, 63–86 (in Chinese).
Tehranian, H., Travlos, N., Waegelein, J., 1987. The effect of long-term performance plans on corporate sell-off-induced abnormal returns. J. Finance 42, 933–942.
Tobin, J., 1969. A general equilibrium approach to monetary theory. J. Money, Credit, Banking 1, 15–29.
Wan, H., Chen, X., 2012. Shareholder monitoring, compensation contract efficiency and perquisite consumption: a study on the '59-year-old phenomenon' of state-owned enterprise managers. China Acc. Finance Rev. 4, 111–174 (bilingual both in Chinese and English).
White, H., 1980. Nonlinear regression on cross section data. Econometrica 48, 721–746.
Wu, Y., Wu, S., 2010. Executive compensation: incentives or self-interest? Evidence from the listed firms in China. Acc. Res. 11, 40–48 (in Chinese).
Xin, Q., Lin, B., Wang, Y., 2007. Government control, executive compensation and capital investment. Econ. Res. J. 8, 110–122 (in Chinese).
Xu, X., Zhang, T., 2009. Corporate governance, free cash flow and inefficient investment in China. J. Finance Econ. 10, 47–58 (in Chinese).
Zeng, Q., Chen, X., 2006. Which internal governance mechanisms affect equity agency cost – a comparison of governance efficiency between block shareholder and the board of directors. J. Finance Econ. 2, 106–117 (in Chinese).
Zhang, R., 2010. Is There An End-of-The-Game Effect – Evidence from Chinese Stock Markets, Working Paper (in Chinese).
Zheng, J., He, X., Wang, H., 2001. Financial constraints of public company investment: from the perspective of ownership structure. J. Finance 8, 92–99 (in Chinese).
Zhou, Z., 2003. Empirical research on management compensation of China's listed companies. Reform 3, 50–57 (in Chinese).
Zhou, J., Huang, D., 2006. Risk and pay-performance sensitivity in managerial compensation: evidence from listed companies in China. Acc. Res. 4, 44–50 (in Chinese).
Zhu, H., 2002. The Cause and Economic Consequences of Turnover of Top Management: An Empirical Study Based on Firm Performance. Doctoral Dissertation, Shanghai University of Finance and Economics.