

**What Determines the Synchronicity  
of Stock Price Movements in the  
Shanghai and Shenzhen Stock Exchanges?**

Julan Du  
He Hao  
Chenggang Xu

Shanghai-Hong Kong Development Institute

Hong Kong Institute of Asia-Pacific Studies

August 2007

**About the Authors**

Julan Du is Assistant Professor in the Department of Economics, The Chinese University of Hong Kong.

He Hao is Equity Analyst of the China International Capital Corporation Limited (Beijing).

Chenggang Xu is Lecturer in the Department of Economics, London School of Economics and Political Science; and Visiting Professor in the Department of Economics, Hong Kong University of Science and Technology.

Opinions expressed in the publications of the Shanghai-Hong Kong Development Institute and Hong Kong Institute of Asia-Pacific Studies are the authors'. They do not necessarily reflect those of the Institutes.

© 2007 Julan Du, He Hao and Chenggang Xu

ISBN 978-962-441-818-7

All rights reserved. No part of this book may be reproduced in any form without written permission from the authors.

## **What Determines the Synchronicity of Stock Price Movements in the Shanghai and Shenzhen Stock Exchanges?**

### **Introduction**

Synchronicity of stock price movement refers to the extent to which individual stock prices move up and down en masse. As Roll (1988) made clear, the degree of stock price co-movement depends on the relative amounts of firm-level and market-wide information that have been capitalized into stock prices. Recent studies such as those by Campbell et al. (2001) and Morck et al. (2000) have documented a marked decline in the synchronicity of stock price movements and a salient increase in firm-specific variations in US stock returns. More importantly, various studies have demonstrated that stock market synchronicity may be related to institutional quality in an economy and stock market. Morck et al. (2000) showed that in the mid-1990s, stock prices in low-income and weak-institution economies moved much more synchronously than those in high-income and strong-institution economies. Beny (2005) found a significant positive correlation between the stringency of a country's prohibitions against insider trading and the asynchronicity of individual stock returns. She interpreted the result as indicating that in countries with tougher insider trading laws stock prices are more informationally efficient. Fox et al. (2003) found firm-specific price variations to be significantly higher in the years following a major historical tightening in the US disclosure laws than in prior years for the most affected stocks, but not for other stocks. This again links greater firm-specific variations

to better disclosure of corporate information. Similarly, Bushman et al. (2004) found that stock returns exhibit greater variations in firm-specific returns in countries with more developed financial analysis industries and with a freer press than in countries where such industries are less developed and the press under greater restraints.

However, there have so far been no studies linking firm-level stock price synchronicity with corporate governance. In this paper, we systematically investigate this issue for Chinese companies listed in the stock exchanges of Shanghai and Shenzhen. China is a good platform to explore the relationship between corporate governance and stock price synchronicity. China is known to have weak legal foundations for the development of stock markets. Information disclosure laws and their enforcement are particularly weak. Under this circumstance, corporate governance at the firm level and public governance at the regional (provincial) level is expected to play an especially important role in enhancing the disclosure of corporate information. Some listed companies, out of a determination to upgrade themselves and raise more funds in the future, try to disclose information in a more truthful and timely manner, thereby developing a good reputation in the stock markets. Some regions with a stronger system of public governance may also perform relatively well in the disclosure of corporate information. In this sense, examining the case of China can show us how corporate and regional public governance can partially make up for the absence of effective formal legal institutions.

We use a four-year panel dataset collected from the annual reports of listed firms in the stock exchanges of Shanghai and Shenzhen. Rather than relying on survey data, we employ the actual measures for the practice of corporate governance for all listed firms in China from 1999 to 2002. Controlling for a number of variables that are typically included in studies of stock return synchronicity, we use  $R_{it}^2$  to determine the synchronicity of these firms. Estimating both fixed-effects and random-effects models, we document statistically strong effects of indicators of static and dynamic corporate governance and regional governance mechanisms on stock return synchronicity. More concretely, we find very strong empirical support for our main hypotheses that there are negative relationships between the quality of

static corporate governance and stock return synchronicity, between mechanisms of dynamic corporate governance and stock return synchronicity, and between the quality of regional governance and stock return synchronicity.

The rest of the paper is organized as follows. Section 2 describes the data and variables used in the study. Section 3 discusses the estimation methodology. Section 4 presents the results of the econometric analysis. Section 5 concludes with a summary of the results.

### **Data, Variables, and Hypotheses**

Our data were mainly drawn from China Stock Market & Accounting Research Database (CSMAR), and the China Marketization Index Dataset (Fan and Wang, 2004), complemented by useful information from the *China Listed Company Yearbook*, and the Shanghai and Shenzhen Stock Exchanges. The sample includes all listed companies on the stock exchanges of both Shanghai and Shenzhen between 1999 and 2002.

#### ***Static Corporate Governance Mechanisms***

Good corporate governance consists of a set of mechanisms to ensure that suppliers of finance obtain a decent return on their investment. Theoretically speaking, better corporate governance leads to better information disclosure, so that the firm's stock returns exhibit less synchronicity.

In China's listed companies, there are several internal mechanisms of governance including an ownership structure, a board of directors, executive compensation, and financial disclosure. Ownership structure is crucial to the maximization of a firm's value. Concentrated equity ownership confers on the controlling shareholders a substantial amount of discretionary power to maximize their personal gain using the firm's resources. Claessens et al. (2000) found that cross-holdings and a pyramidal ownership structure are common in Asian economies. This kind of ownership structure allows controlling shareholders to

obtain even more control for a minimal capital outlay so that tunnelling becomes easier. Listed companies in China usually have a controlling shareholder who holds a significant stake. Therefore, it is feasible for the controlling shareholder to transfer corporate resources out of the listed company into the parent company or to the accounts of other related parties. On the other hand, ownership concentration may also have a positive effect on corporate governance. Shleifer and Vishny (1986) have argued that a large shareholder can mitigate the free-rider problem among shareholders in monitoring the managers of a company. We believe both the positive and negative effects of having a large controlling shareholder can exist in China's listed companies. Which effect dominates is an empirical question.

We consider several measures of ownership concentration. First, we denote the stake of the largest shareholder as *largest\_stake*. We use this variable to measure the largest shareholder's interest in a company and also the largest shareholder's power on the board. Second, we look at the ownership concentration of the second to the tenth largest shareholders in the company. We take the natural logarithm of the sum of the squares of the percentage points of the shareholdings of the second to the tenth largest shareholders and denote it as *lnsq2\_10*. Third, we consider one more variable that indicates whether or not the largest shareholder is some level of government or a state-owned legal person. Governments probably have goals that are in conflict with the market, such as maintaining a certain level of employment and safeguarding social stability at the expense of pursuing profit maximization. A controlling government shareholder can use the listed company as a vehicle to achieve these policy goals, even though they are in variance with the interests of shareholders (Bai et al., 2004). Therefore, we take a dummy variable that equals one if the largest shareholder is a government and zero otherwise, and denote it as *gvnt\_ctrl*. We expect this variable to have negative (positive) effects on the disclosure of corporate information (stock return synchronicity).

There are some mechanisms of corporate governance stipulated by law to ensure financial transparency and the adequate disclosure of information. To better monitor companies, shareholders need

sufficient, accurate, and up-to-date information on a firm's operations and financial situation. Most listed companies in China are audited by local accounting firms, whose practices may not be up to international standards. The corporate data audited by the local accounting firms may not be as reliable as those audited by foreign accounting firms, especially the Big Four international accounting firms. However, companies issuing H shares, which are listed in the Hong Kong Stock Exchange, and companies issuing B shares, which are mainly traded in US dollars for foreign investors at the Shanghai or Shenzhen Stock Exchanges, must adopt international accounting standards. This provides those companies that issue H and B shares with better information disclosure mechanisms than other companies that do not issue such shares. We take a dummy variable equal to one if a company has H shares traded in Hong Kong or B shares traded in the Shanghai or Shenzhen Stock Exchanges, and zero otherwise. We denote this dummy variable as *b&h*.

### *Dynamic Corporate Governance Mechanisms*

By dynamic corporate governance mechanisms, we mean changes to the chairman of the board of directors and the general manager of a company. There is a large literature in the US on the relationship between firm performance and turnover in top management (Coughlan and Schmidt, 1985; Warner et al., 1988; Weisbach, 1988; Denis et al., 1997). For instance, turnover in top executives is negatively related to both stock market performance and accounting-based measures of corporate performance. This relationship is stronger when the board is dominated by outside directors (Weisbach, 1988) or in firms with a block shareholder (Denis et al., 1997). In other words, poor stock performance as well as poor sales and earnings increase the likelihood of executive turnover (Kaplan, 1994; Kang and Shivdasani, 1995). Hence, executive turnover is widely regarded as a means of improving corporate governance.

We treat the chairman of the board of directors and the general manager as two separate groups. For each group, we divide the "changes" into four categories: whether or not the reasons for leaving the position are related to corporate governance; whether the

successor comes from within or outside the company; whether the successor takes the position permanently or temporarily; and whether or not the chairman and the general manager are the same person. Each of the above categories is a potential means of improving corporate governance, which is expected to lead to better disclosure of information.

We construct several variables to measure dynamic corporate governance. First, a dummy variable is denoted as *chg*. It takes a value of one if the changes in the chairman or general manager happened in one particular year, and zero otherwise. This is a key variable, because all of the variables that will be introduced below are set up to be conditional on this *chg* variable. We expect this variable to have a negative impact on the stock return synchronicity. Second, we consider a variable indicating the reason why the posts of chairman of the board of directors and general manager were vacated. According to the CSMAR, there are 12 different reasons why people leave top management positions: 1. changes in work assignment: removal from the position because of an assignment to another position; 2. retirement; 3. expiration of the term of office; 4. a change of controlling shareholder; 5. resignation: voluntary resignation of the position for unknown reasons; 6. dismissal: dismissal for unknown reasons; 7. health-related reasons, including death; 8. personal reasons; 9. improvements in corporate governance; 10. involvement in litigation; 11. others; 12. the end of the period of service as the acting general manager or president.

Based on the classifications by the CSMAR, we find that reasons 2, 3, 7, 8, 11, and 12; namely, retirement, expiration of term of office, health-related reasons, personal reasons, others, and the end of service in an acting position, are not apparently related to corporate governance. We denote these normal reasons for leaving the positions conditional on changes as *chg\_normal*, which means that the chairman or general manager has changed for normal reasons. On the other hand, reasons 1, 4, 5, 6, 9, and 10; namely, changes in work assignment, changes in share-controlling rights, resignation, dismissal, improvements in corporate governance, and involvement in litigation, are closely related to improvements in corporate governance. We denote these

abnormal cases for leaving the managerial posts conditional on changes as *chg\_abnormal*, which means that the chairman or general manager has changed for abnormal reasons. In our opinion, *chg\_normal* would not have a significant effect on synchronicity, while *chg\_abnormal* would have a negative and significant impact on stock price synchronicity.

If a chairman or general manager leaves, we are concerned not only about the reasons for the departure but also about the source of the successor. We classify sources of successors into internal sources and external sources. If a successor did (not) previously hold a position in the listed company, the source is internal (external). We denote the internal and external sources conditional on change as *chg\_internal* and *chg\_external*, respectively. Often it is the case that new officers coming from outside bring fresh approaches to corporate operations, so that the appointment of such officers may lead to an improvement in corporate governance. Hence, we predict that *chg\_external* would have a negative significant effect on stock price synchronicity.

Whether the successor takes the position temporarily or permanently could be an important factor affecting the quality of corporate governance. A successor who takes up a permanent position is expected to form a longer-term business strategy, which may prompt him or her to make efforts to improve corporate governance including the disclosure of corporate information. We denote the circumstance of a successor taking up the position temporarily conditional on change as *chg\_ifagent\_yes*, which means the chairman or general manager has changed and that his or her successor will take up the position only temporarily. We denote the scenario of a successor taking the position permanently as *chg\_ifagent\_no*, which means that the chairman or general manager has changed and that the successor will take up the position as a permanent job. Although we are not sure about the sign of *chg\_ifagent\_yes*, we predict that the effect of this variable on stock return synchronicity will not be significant. However, we forecast that *chg\_ifagent\_no* would have a negative and significant effect on stock return synchronicity.

We denote the circumstance where the chairman and the general manager are the same person, conditional on changes taking place,

as *chg\_indep\_no*, which means that the chairman and the general manager have both changed. Furthermore, we denote the situation where the chairman and the general manager are not the same person, conditional on changes taking place, as *chg\_indep\_yes*. We expect *chg\_indep\_no* to have a more significant negative effect on stock return synchronicity, because changing both the chairman and the general manager would have a bigger impact on corporate governance.

### ***Regional Governance Mechanisms***

Good regional governance consists of a set of institutions to balance the roles of the government and the market, improve market environment, and stimulate the growth of both goods markets and factor markets. Better regional governance could lead to better informational efficiency so that firms in the region exhibit less stock return synchronicity.

It is well documented in the literature that market reforms have been the engine for China's rapidly growing economy (Jefferson et al., 1992). However, China's rapid economic transformation since 1979 has been accompanied by the development of stark regional disparities as marketization and industrialization progressed. The coastal provinces have swiftly integrated with world markets, while inland regions have lagged far behind in the development of markets. This imbalance in regional development is expected to create large variations in the business environment, business practices, and corporate governance strategies of listed companies in different regions. This in turn may give rise to different patterns of stock price co-movements in companies operating in different regions.

To gauge the process of marketization in China, Fan and Wang (2004) constructed indices to measure the relative marketization process among regions. Their measures consist of 25 fundamental indices covering the following five aspects of marketization: the development of the non-state sector, the relationship between the government and the market, the growth of the goods market, the growth of the factor market, and the legal environment for the market economy.

We denote the relationship between the government and the

market as *gov\_mkt\_rel*. This variable measures the power of market forces in the allocation of resources and the extent of government interference with the market. It also measures the burden to the market and to society caused by a large government. The closer the relationship between the government and the market is in a province, the lower the score that will be assigned to this variable.

Theoretically, when there is intense government interference with the business sector, government policies will have a tremendous impact on business operations. As regional government policies affect all firms in a region, the corporate fundamentals of regional listed companies tend to exhibit similar movements. This would lead to a greater degree of return co-movement. Hence, we expect that government intervention will raise stock return synchronicity.

We denote the state of the development of the non-state sector as *non\_sta\_econ*. According to Fan and Wang (2004), the more the non-state economy in a province flourishes, the higher the score the index will receive. According to Fan and Wang (2004), the non-state sector accounts for two thirds of the whole national economy, especially in the industries of architecture, transportation, and food; however, it is still weak in service industries such as telecommunications, finance, and insurance. A stronger non-state economy means the scope and degree of government intervention in business operations are smaller, which may reduce the possibility of government intervention driving corporate fundamentals in a common direction and hence stock price co-movements.

The development of goods and factor inputs markets is an important indicator of market development. Before the outset of economic reforms, the prices of most goods in China were controlled by the government. By the year 2000, this percentage had plummeted to 10%. The development of a goods market also refers to a decrease in attempts by local governments to protect local markets by erecting barriers to the entry of regional markets. We denote the growth of a goods market as *gds\_mkt\_ext*, and expect this variable to have negative effects on stock return synchronicity. Similarly, we denote the growth of factor markets as *fct\_mkt\_ext*. This variable is to measure the openness of the capital market, labour market, and the usage of

homeland resources. According to Fan and Wang (2004), the more the factor market flourishes, the higher the score this variable will take. A better developed factor market implies a better developed capital market, which certainly has a more efficient system for disclosing market information, and which would lead to a less extent of stock return co-movements. Moreover, in China, the development of the goods and factor markets also means a declining level of government interference with the business sector. This reduces the influence of government policies on business operations, which in turn reduces the synchronicity of stock returns.

Legal institutions are an important foundation for the healthy development of a market economy. We measure the development of legal institutions by the ratio of barristers and accountants to the total population in a specific province and the extent of the legal environment. We denote this variable that gauges the development of intermediary organizations and the legal environment for a market economy as *mkt\_agt\_lgl*. The more adequate the legal institutions are, the higher value that will be assigned to this variable. The survey by Fan and Wang (2004) showed that the development of market intermediary agencies and the legal environment in China is unbalanced. As the development of legal institutions improves corporate governance and, thus, enhances the disclosure of corporate information, we expect this variable to have a negative impact on stock return synchronicity.

### ***Stock Price Synchronicity***

To measure the stock return synchronicity of individual companies, we adopt the methodology of Morck et al. (2000) and Li et al. (2003) and measure the degree of an individual company's stock price co-movement. A higher degree of synchronicity of stock price movement indicates less firm-specific variation in stock returns, and thus a lower level of informational efficiency for stock prices.

We start by assessing the synchronicity of individual stock *i* in year *t*. We use the following model:

$$\gamma_{it} = \alpha_i + \beta_{1i} \gamma_{mt}^{Shanghai} + \beta_{2i} \gamma_{mt}^{Shenzhen} + \beta_{3i} [\gamma_{US,t} + \varepsilon_{US,t}] + \beta_{4i} [\gamma_{HK,t} + \varepsilon_{HK,t}] + \varepsilon_{it}$$

where  $\gamma_{it}$  is firm *i*'s return in period *t*,  $\gamma_{mt}^{Shanghai}$  and  $\gamma_{mt}^{Shenzhen}$  are the Shanghai and Shenzhen stock market index returns in period *t* respectively,  $\gamma_{US,t}$  and  $\gamma_{HK,t}$  are the US and Hong Kong stock market index returns respectively,  $\varepsilon_{US,t}$  and  $\varepsilon_{HK,t}$  are the rate of change in the exchange rate between the RMB and the US dollar or Hong Kong dollar respectively, and  $\varepsilon_{it}$  is the disturbance term. For each year, we use the weekly data on the individual company's stock return, the stock market index return, and the change in the exchange rate to conduct regressions. Calculating from this regression for firm *i* in year *t*, we obtain  $R_{it}^2$  and  $SST_{it}$  for all companies from one particular province. We will use  $R_{it}^2$  as the dependent variable in the subsequent regression models. A higher  $R_{it}^2$  means that the price movement of the individual company *i*'s stock is driven more by market factors and less by the firm-specific factors, i.e., it shows a higher degree of stock price co-movement.

### ***Control Variables***

We include some firm characteristics and regional characteristics as control variables in our analysis. Variables for firm characteristics mainly include total assets, book value leverage, and Tobin's *q*. We denote the natural logarithm of the total assets of a listed company as *lg\_tot\_asst*, the book value leverage of a listed company as *book\_value\_lev*, and Tobin's *q* as *tq*. To control for industry and provincial fixed effects, we also include 13 industry dummy variables and 31 province dummy variables. Variables for regional characteristics include the natural logarithm of GDP per capita, the ratio of FDI (foreign direct investment) to GDP, the ratio of total trade value to GDP, and the ratio of total industrial output to GDP, which are denoted as *lg\_pcgdp*, *fdi/gdp*, *trade/gdp*, and *ind/gdp*, respectively. They mainly reflect the level of economic development and the openness of different regions. We expect them to have negative effects on stock return synchronicity.

## Methodology

We employ three groups of variables and three estimation methods: ordinary least squares (OLS), fixed-effects, and random-effects using the four-year panel dataset. We estimate both a fixed-effects model and a random-effects model because some of the variables of corporate governance are time-invariant and their effects cannot be estimated by a fixed-effects model. A general form of the OLS regression model is as follows,

$$R_{it}^2 = \alpha + \beta'X_{it} + \varepsilon_{it}$$

where  $X_{it}$  includes all of the independent variables,  $\alpha$  is a constant term, and  $\varepsilon_{it}$  is a random error.

In terms of fixed-effects regressions, we set up a general form as follows,

$$R_{it}^2 = \alpha_i + \gamma_t + \beta'X_{it} + \varepsilon_{it}$$

where  $\alpha_i$  is the firm fixed-effects term,  $\gamma_t$  is the year fixed effects, and  $\varepsilon_{it}$  is the random error.

A general form of the random-effects regression model is as follows,

$$R_{ijt}^2 = \theta + v_i + \gamma_t + \beta'X_{ijt} + \eta_j + \varepsilon_{ijt}$$

where  $v_i$  is the random disturbance characterizing the  $i$ -th firm or the  $i$ -th province,  $\gamma_t$  is the constant year effect,  $\theta$  is a constant term,  $\eta_j$  is the province fixed effect, and  $\varepsilon_{ijt}$  is the random error.

## Empirical Results

### Summary Statistics

Table 1 reports the summary statistics for the variables of static corporate governance. The proportion of listed companies that have issued H or B shares is less than 5%. About 40% of the listed companies in China are controlled by the government. The mean stake holding of the largest shareholder is 44.1%, with a maximum value

**Table 1** Summary statistics for the variables of static corporate governance

Year	Variable	No. of obs.	Mean	S.D.	Min.	Max.
1999	<i>b&amp;h</i>	1266	0.0332	0.1792	0	1
	<i>gvnt_ctrl</i>	913	0.3888	0.4878	0	1
	<i>largest_stake</i>	913	45.5844	18.0156	0.4090	88.5800
	<i>lnsq2_10</i>	912	3.3203	2.5920	-4.0687	7.4398
	<i>lg_tot_asst</i>	908	20.7544	0.8356	18.6242	24.0176
	<i>book_value_lev</i>	908	0.4641	0.4157	0	3.4247
2000	<i>b&amp;h</i>	1266	0.0332	0.1792	0	1
	<i>gvnt_ctrl</i>	1050	0.3810	0.4859	0	1
	<i>largest_stake</i>	1050	44.9236	17.7692	2.1400	88.5800
	<i>lnsq2_10</i>	1050	3.2264	2.7713	-5.2785	7.2730
	<i>lg_tot_asst</i>	1044	20.8975	0.8222	18.5561	24.3860
	<i>book_value_lev</i>	1044	0.4734	0.7291	0	18.2741
2001	<i>b&amp;h</i>	1266	0.0332	0.1792	0	1
	<i>gvnt_ctrl</i>	1299	0.3561	0.4790	0	1
	<i>largest_stoke</i>	1299	43.5100	18.5955	1.7900	85.0000
	<i>lnsq2_10</i>	1299	3.3308	2.7786	-7.7634	7.2781
	<i>lg_tot_asst</i>	1125	20.9757	0.8711	17.7066	26.6102
	<i>book_value_lev</i>	1125	0.5219	0.5592	0	7.5537
2002	<i>b&amp;h</i>	1266	0.0332	0.1792	0	1
	<i>gvnt_ctrl</i>	1198	0.3239	0.4681	0	1
	<i>largest_stake</i>	1198	42.5378	18.4700	0	85.0000
	<i>lnsq2_10</i>	1171	3.4858	2.5789	-8.1491	8.0863
	<i>lg_tot_asst</i>	1188	21.0318	0.9176	17.5534	26.6324
	<i>book_value_lev</i>	1188	0.6151	1.1062	0	24.3478



of 88.6%. The mean and the standard deviation for the concentration of the second to the tenth largest shareholders are 3.34 and 2.68, respectively.

Tables 2 and 3 report the summary statistics for the variables of dynamic corporate governance. Overall, 22.3% of companies changed their chairman and 18.5% changed their general manager. The proportion of changes in chairmen and general managers for normal reasons is as low as only 3.3% and 2.8% respectively, compared with the corporate governance-related ones of 6.5% and 7.3% respectively. Successors to chairmen are more often drawn from internal sources (11.7%) than from external sources (9.8%). However, successors for the position of general manager come more often from external than internal sources. Temporary changes in chairmen and general managers are surprisingly rare, at only 0.9% and 0.4% respectively. Most successors take up the position permanently, with 21.4% of the changes in chairmen and 18.3% of the changes in general managers being permanent.

Table 4 reports the summary statistics for the variables of regional governance. The four-year mean and variance of the index on the relationship between governments and markets are 6.74 and 1.49 respectively, and the highest value is 9.18. The four-year mean of the index on the extent of the non-state sector is 6.75, and the highest value is 12.05. The four-year mean of the index on the growth of the goods market is 7.99, and that of the factor market is 4.62, implying that the goods market is better developed on average than the factor market. The mean and the variance of the index on the development of intermediary organizations and the legal environment in markets are 5.94 and 1.84 respectively, and the highest value is 11.04.

### **Results on Static Corporate Governance Mechanisms**

In this part, we investigate empirically the effects of the static corporate governance mechanisms on stock return synchronicity. We employ  $R_{it}^2$  as the dependent variable. The explanatory variables include four variables of static corporate governance, *b&h*, *gvnt\_ctrl*, *largest\_stake*, and *lnsq2\_10*, together with the control variables

**Table 2** Summary statistics for the variables of dynamic corporate governance: Chairman

Year	Variable	No. of obs.	Mean	S.D.	Min.	Max.
1999	<i>chg</i>	1266	0.1967	0.3976	0	1
	<i>chg_normal</i>	1266	0.0371	0.1891	0	1
	<i>chg_abnormal</i>	1266	0.0664	0.2490	0	1
	<i>chg_internal</i>	1266	0.1216	0.3270	0	1
	<i>chg_external</i>	1266	0.0758	0.2648	0	1
	<i>chg_ifagent_yes</i>	1266	0.0047	0.0687	0	1
	<i>chg_ifagent_no</i>	1266	0.1919	0.3940	0	1
	<i>chg_indep_yes</i>	1266	0.1367	0.3504	0	1
2000	<i>chg</i>	1266	0.2346	0.4239	0	1
	<i>chg_normal</i>	1266	0.0237	0.1522	0	1
	<i>chg_abnormal</i>	1266	0.0592	0.2362	0	1
	<i>chg_internal</i>	1266	0.1453	0.3526	0	1
	<i>chg_external</i>	1266	0.0893	0.2852	0	1
	<i>chg_ifagent_yes</i>	1266	0.0039	0.0627	0	1
	<i>chg_ifagent_no</i>	1266	0.2306	0.4214	0	1
	<i>chg_indep_yes</i>	1266	0.1809	0.3851	0	1
2001	<i>chg</i>	1266	0.2235	0.4168	0	1
	<i>chg_normal</i>	1266	0.0284	0.1663	0	1
	<i>chg_abnormal</i>	1266	0.0687	0.2531	0	1
	<i>chg_internal</i>	1266	0.1185	0.3233	0	1
	<i>chg_external</i>	1266	0.1051	0.3067	0	1
	<i>chg_ifagent_yes</i>	1266	0.0047	0.0687	0	1
	<i>chg_ifagent_no</i>	1266	0.2188	0.4136	0	1
	<i>chg_indep_yes</i>	1266	0.1540	0.3611	0	1
2002	<i>chg</i>	1266	0.2354	0.4244	0	1
	<i>chg_normal</i>	1266	0.0434	0.2039	0	1
	<i>chg_abnormal</i>	1266	0.0648	0.2462	0	1
	<i>chg_internal</i>	1266	0.0837	0.6011	0	1
	<i>chg_external</i>	1266	0.1201	0.3252	0	1
	<i>chg_ifagent_yes</i>	1266	0.0213	0.5126	0	1
	<i>chg_ifagent_no</i>	1266	0.2141	0.4178	0	1
	<i>chg_indep_yes</i>	1266	0.1817	0.3857	0	1
	<i>chg_indep_no</i>	1266	0.0324	0.1771	0	1

**Table 3** Summary statistics for the variables of dynamic corporate governance: General Manager

Year	Variable	No. of obs.	Mean	S.D.	Min.	Max.
1999	<i>chg</i>	1266	0.1754	0.3804	0	1
	<i>chg_normal</i>	1266	0.0300	0.1707	0	1
	<i>chg_abnormal</i>	1266	0.0742	0.2623	0	1
	<i>chg_internal</i>	1266	0.0790	0.2698	0	1
	<i>chg_external</i>	1266	0.0964	0.2952	0	1
	<i>chg_ifagent_yes</i>	1266	0.0047	0.0973	0	1
	<i>chg_ifagent_no</i>	1266	0.1730	0.3784	0	1
	<i>chg_indep_yes</i>	1266	0.0545	0.2471	0	1
	<i>chg_indep_no</i>	1266	0.1106	0.3137	0	1
2000	<i>chg</i>	1266	0.1722	0.3777	0	1
	<i>chg_normal</i>	1266	0.0261	0.1594	0	1
	<i>chg_abnormal</i>	1266	0.0608	0.2391	0	1
	<i>chg_internal</i>	1266	0.0853	0.2795	0	1
	<i>chg_external</i>	1266	0.0861	0.2806	0	1
	<i>chg_ifagent_yes</i>	1266	0.0039	0.0627	0	1
	<i>chg_ifagent_no</i>	1266	0.1682	0.3742	0	1
	<i>chg_indep_yes</i>	1266	0.0561	0.2302	0	1
	<i>chg_indep_no</i>	1266	0.1051	0.3067	0	1
2001	<i>chg</i>	1266	0.1959	0.3970	0	1
	<i>chg_normal</i>	1266	0.0197	0.1392	0	1
	<i>chg_abnormal</i>	1266	0.0798	0.2711	0	1
	<i>chg_internal</i>	1266	0.0964	0.2995	0	1
	<i>chg_external</i>	1266	0.0995	0.2995	0	1
	<i>chg_ifagent_yes</i>	1266	0.0008	0.0281	0	1
	<i>chg_ifagent_no</i>	1266	0.1951	0.3964	0	1
	<i>chg_indep_yes</i>	1266	0.0656	0.2476	0	1
	<i>chg_indep_no</i>	1266	0.1003	0.3005	0	1
2002	<i>chg</i>	1266	0.1983	0.3988	0	1
	<i>chg_normal</i>	1266	0.0348	0.1832	0	1
	<i>chg_abnormal</i>	1266	0.0774	0.2673	0	1
	<i>chg_internal</i>	1266	0.0798	0.3803	0	1
	<i>chg_external</i>	1266	0.1106	0.3137	0	1
	<i>chg_ifagent_yes</i>	1266	0.0047	0.2576	0	1
	<i>chg_ifagent_no</i>	1266	0.1951	0.3964	0	1
	<i>chg_indep_yes</i>	1266	0.0932	0.2908	0	1
	<i>chg_indep_no</i>	1266	0.0877	0.2829	0	1

**Table 4** Summary statistics for the variables of regional governance

Year	Variable	No. of obs.	Mean	S.D.	Min.	Max.
1999	<i>gov_mkt_rel</i>	1266	6.6683	1.4081	0	8.3800
	<i>non_sta_econ</i>	1266	5.7825	2.4295	0	10.0000
	<i>gds_mkt_ext</i>	1266	7.4861	1.7105	0	9.7900
	<i>fct_mkt_ext</i>	1266	4.2088	1.8999	0	7.2100
	<i>mkt_agt_lgl</i>	1266	5.4615	1.3110	0	7.5300
	<i>lg_pcgdp</i>	1266	9.0812	0.5950	7.8070	10.2174
	<i>fdi/gdp</i>	1249	0.0489	0.0396	0.0015	0.1260
	<i>trade/gdp</i>	1266	0.4333	0.4710	0.0316	1.3729
	<i>ind/gdp</i>	1266	0.8669	0.3176	0.1419	1.5596
2000	<i>gov_mkt_rel</i>	1266	6.6361	1.4701	0	8.3700
	<i>non_sta_econ</i>	1266	6.3664	2.3568	0	10.6900
	<i>gds_mkt_ext</i>	1266	7.6950	1.5920	0	9.8800
	<i>fct_mkt_ext</i>	1266	4.5750	2.1206	0	7.8700
	<i>mkt_agt_lgl</i>	1266	5.7570	1.3555	0	7.9700
	<i>lg_pcgdp</i>	1266	9.1395	0.5646	7.9440	10.2105
	<i>fdi/gdp</i>	1258	0.0377	0.0322	0.0014	0.0999
	<i>trade/gdp</i>	1266	0.5107	0.5423	0.0368	1.6576
	<i>ind/gdp</i>	1266	0.9145	0.3247	0.1399	1.5899
2001	<i>gov_mkt_rel</i>	1266	6.6842	1.4882	-2.2200	8.3200
	<i>non_sta_econ</i>	1266	6.9478	2.4838	0.5900	11.3500
	<i>gds_mkt_ext</i>	1266	8.3985	1.2214	3.9900	10.0200
	<i>fct_mkt_ext</i>	1266	4.7831	2.4287	0.9400	8.3600
	<i>mkt_agt_lgl</i>	1266	6.0843	2.2412	2.9700	10.7600
	<i>lg_pcgdp</i>	1266	9.2453	0.5895	7.9571	10.3312
	<i>fdi/gdp</i>	1249	0.0345	0.0271	0.0011	0.0877
	<i>trade/gdp</i>	1266	0.4949	0.5093	0.0408	1.4997
	<i>ind/gdp</i>	1266	0.9263	0.3407	0.1289	1.5980
2002	<i>gov_mkt_rel</i>	1266	6.9837	1.5738	-0.9800	9.1800
	<i>non_sta_econ</i>	1266	7.9161	2.5010	1.4000	12.0500
	<i>gds_mkt_ext</i>	1266	8.3864	1.3128	3.8300	10.1500
	<i>fct_mkt_ext</i>	1266	4.9188	2.3804	1.2800	8.7400
	<i>mkt_agt_lgl</i>	1266	6.4607	2.4610	1.7300	11.0400
	<i>lg_pcgdp</i>	1266	9.3372	0.5909	8.0354	10.4129
	<i>fdi/gdp</i>	1258	0.0362	0.0280	0.0011	0.0860
	<i>trade/gdp</i>	1266	0.5318	0.5389	0.0430	1.5549
	<i>ind/gdp</i>	1266	0.9613	0.3512	0.1207	1.6201

including *lg\_tot\_asst*, *book\_value\_lev*, *tq*, *lg\_pcgdp*, *fdi/gdp*, *trade/gdp*, *ind/gdp*, industry dummies, and province dummies.

Our results are presented in Table 5. With regard to the OLS model, if a company has H shares trading in the Hong Kong Stock Exchange, or B shares trading in the Shanghai or Shenzhen Stock Exchanges, its stock return synchronicity is significantly lower. The coefficient of *gvnt\_ctrl* is positive, but not statistically significant. Hence, we find the expected positive relationship between *gvnt\_ctrl* and stock return synchronicity, although it is not significant. The coefficients of *largest\_stake* and *lnsq2\_10* are negative and statistically significant. The results suggest that the concentrated ownership structure of China's listed companies has improved corporate governance and the disclosure of corporate information. Among the three control variables for firm-specific characteristics, *lg\_tot\_asst*, *book\_value\_lev*, and *tq*, the leverage ratio of the firm has a statistically significant positive effect on stock return synchronicity, while Tobin's q and total assets have statistically significant negative effects. For control variables for regional characteristics, *lg\_pcgdp*, *fdi/gdp*, *trade/gdp*, and *ind/gdp*, the ratio of total industrial output to GDP has a statistically significant negative effect on stock return synchronicity, but the other three variables have signs that are opposite to our prediction.

With regard to the fixed-effects model, all of the results are consistent with the OLS ones, except that the estimated coefficient of *gvnt\_ctrl* has become negative although it remains statistically insignificant. The random-effects model allows us to estimate the impact of time-invariant variables. We find that the concentration of shares from the second to the tenth largest shareholders has a statistically significant negative effect on stock return synchronicity. All of the results are consistent with those of the OLS model, which confirms our theoretical predictions.

### Results on Dynamic Corporate Governance Mechanisms

#### Results from Changes in Chairmen

In this sub-section, we investigate empirically the effects of the selected chairman-change corporate governance mechanisms on stock return synchronicity. As before, we use  $R_{it}^2$  as the dependent variable.

**Table 5** Static corporate governance and stock return synchronicity

Estimation	OLS	Fixed-effects	Random-effects
<i>b&amp;h</i>	-0.0359** (-2.23)	—	-0.0338* (-1.77)
<i>gvnt_ctrl</i>	0.0056 (0.84)	-0.0111 (-0.38)	0.0036 (0.47)
<i>largest_stake</i>	-0.0005* (-1.93)	-0.0014** (-1.97)	-0.0004* (-1.67)
<i>lnsq2_10</i>	-0.0076*** (-4.95)	-0.0059* (-1.73)	-0.0071*** (-4.27)
<i>lg_tot_asst</i>	-0.0228*** (-3.62)	-0.1264*** (-9.08)	-0.0256*** (-5.48)
<i>book_value_lev</i>	0.0097** (2.01)	0.0105** (2.08)	0.0101** (2.44)
<i>tq</i>	-0.0682*** (-4.31)	-0.0642*** (-10.78)	-0.0653*** (-14.42)
<i>lg_pcgdp</i>	1.0233*** (19.73)	1.0528*** (23.66)	1.0202*** (24.05)
<i>fdi/gdp</i>	1.1747*** (2.99)	1.1673*** (3.21)	1.1926*** (3.31)
<i>trade/gdp</i>	0.1520*** (2.70)	0.1764*** (3.06)	0.1556*** (2.71)
<i>ind/gdp</i>	-0.2108* (-1.87)	-0.1886* (-1.78)	-0.2154** (-2.05)

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Note: The year dummies, industry dummies, and province dummies are included but not reported.

The explanatory variables include nine chairman-change variables, *chg*, *chg\_normal*, *chg\_abnormal*, *chg\_internal*, *chg\_external*, *chg\_ifagent\_yes*, *chg\_ifagent\_no*, *chg\_indep\_yes*, and *chg\_indep\_no*, together with industry dummies and province dummies as control variables. To avoid the potential problem of multicollinearity, we put *chg* and the four-pair variables (i.e., *chg\_normal* and *chg\_abnormal*, *chg\_internal* and *chg\_external*, *chg\_ifagent\_yes* and *chg\_ifagent\_no*, and *chg\_indep\_yes* and *chg\_indep\_no*) separately into the regression models.

Table 6 presents the main results. With regard to the OLS model, if the chairman of a company has changed, this is estimated to have a negative effect on stock return synchronicity, which is statistically significant at the 1% level. This means that when the chairman of a firm changes, the stock return synchronicity of this firm becomes significantly smaller. The coefficients of both *chg\_normal* and *chg\_abnormal* are negative and statistically significant. However, the estimated coefficient of *chg\_abnormal* has a larger magnitude and greater statistical significance than that of *chg\_normal*. This implies that changes in chairmen for reasons relating to corporate governance have more pronounced effects on stock return synchronicity.

Interestingly, *chg\_internal* has no significant effects, but *chg\_external* does. Clearly, this means that if a successor comes from the same company, this would not appreciably affect corporate governance and, thus, stock return synchronicity, whereas a successor coming from outside would have a significant negative effect on stock return synchronicity.

Our prediction about the pair *chg\_ifagent\_yes* and *chg\_ifagent\_no* has also been verified. The coefficient of *chg\_ifagent\_yes* is positive and not significant, but the coefficient of *chg\_ifagent\_no* is negative and significant at the 1% level. This implies that if a successor takes up the position temporarily, the synchronicity is not affected; but if a successor takes the position permanently, the synchronicity would become significantly lower.

The last pair is *chg\_indep\_yes* and *chg\_indep\_no*. Since “independent” here means that the chairman and the general manager are not the same person, *chg\_indep\_yes* means that either chairman

**Table 6** Chairman-change variables and stock return synchronicity

Estimation	OLS	Fixed-effects	Random-effects
<i>chg</i>	-0.0187*** (-2.86)	-0.0087 (-1.05)	-0.0237*** (-3.15)
No. of obs.	4223	4223	4223
<i>chg_normal</i>	-0.0309** (-2.18)	-0.0113 (-0.60)	-0.0203 (-1.19)
<i>chg_abnormal</i>	-0.0362*** (-3.32)	-0.0105 (-0.74)	-0.0356*** (-2.84)
No. of obs.	4223	4223	4223
<i>chg_internal</i>	-0.0014 (-0.19)	-0.0239*** (-3.01)	-0.0232*** (-3.17)
<i>chg_external</i>	-0.0349*** (-3.77)	0.0089 (0.75)	-0.0198* (-1.89)
No. of obs.	4223	4223	4223
<i>chg_ifagent_yes</i>	0.0014 (0.11)	-0.0218* (-1.72)	-0.0162 (-1.40)
<i>chg_ifagent_no</i>	-0.0174*** (-2.65)	-0.0110 (-1.32)	-0.0245*** (-3.23)
No. of obs.	4223	4223	4223
<i>chg_indep_yes</i>	-0.0130* (-1.76)	-0.0101 (-1.09)	-0.0185** (-2.21)
<i>chg_indep_no</i>	-0.0403*** (-2.91)	-0.0257 (-1.38)	-0.0562*** (-3.38)
No. of obs.	4223	4223	4223

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Note: The year dummies, industry dummies, and province dummies are included but not reported.

or general manager has changed. Here, it simply means the chairman has changed. Similarly, *chg\_indep\_no* means that both the chairman and the general manager have changed. The results mostly fit our hypothesis. Although the coefficients of both variables are negative and statistically significant, *chg\_indep\_no* has a bigger effect on stock return synchronicity.

The fixed-effects model turns out results that are mostly different from those of the OLS model. The *chg* still has a negative effect. However, it is not statistically significant. The coefficients of both *chg\_normal* and *chg\_abnormal* are negative, and not statistically significant. The results of the pair of *chg\_internal* and *chg\_external* are surprising. The coefficient of the former becomes significantly negative at the 1% level, and that of the latter changes from negative to positive, and is not statistically significant. The results of *chg\_ifagent\_yes* and *chg\_ifagent\_no* also become quite different. The effect of the former turns significantly negative from positive. The effect of the latter is still negative, but becomes statistically insignificant. The last pair is *chg\_indep\_yes* and *chg\_indep\_no*. They still have negative effects as they do in the OLS model. However, both of them become not statistically significant. In summary, we think there must be a factor that is unobservable so that after controlling for this factor in the fixed-effects model, we have different results from those of the OLS model.

The random-effects model allows us to estimate the impact of time-invariant variables. We find that the coefficients of *chg*, *chg\_abnormal*, *chg\_ifagent\_no*, and *chg\_indep\_no* are all negative and statistically significant at the 1% level. Most results are consistent with those of the OLS model, which confirms our theoretical predictions.

#### *Results from Changes in General Managers*

We now turn to examining the effects of the changes in general managers on stock return synchronicity. The dependent variable is still  $R_{it}^2$ . The explanatory variables include nine general manager-change variables, *chg*, *chg\_normal*, *chg\_abnormal*, *chg\_internal*, *chg\_external*, *chg\_ifagent\_yes*, *chg\_ifagent\_no*, *chg\_indep\_yes*, and *chg\_indep\_no*, together with industry dummies and province dummies

as control variables. Again, to avoid the problem of multicollinearity, we put *chg* and the four pairs of variables separately into regression models.

Our results are shown in Table 7. With regard to the OLS model, if a general manager of a company has changed, this would be estimated to have a negative and significant effect at the 1% level on the stock return synchronicity. This means that when a general manager of a firm has changed, the stock return synchronicity of this firm becomes significantly lower. The coefficients of both *chg\_normal* and *chg\_abnormal* are negative and statistically significant.

The coefficient of *chg\_internal* is not statistically significant, but that of *chg\_external* is. Clearly, if a successor comes from the same company, he or she would almost certainly not affect stock return synchronicity. If a successor is from another company, he or she would have a significant negative effect on stock return synchronicity. As for the pair *chg\_ifagent\_yes* and *chg\_ifagent\_no*, the result is also consistent with our hypothesis. The coefficient of *chg\_ifagent\_yes* is positive and not significant, and the coefficient of *chg\_ifagent\_no* is -0.0337 and significant at the 1% level. This implies that if a successor takes the position temporarily, the synchronicity might be slightly bigger, and if a successor takes the position permanently, the synchronicity becomes significantly smaller. The last pair is *chg\_indep\_yes* and *chg\_indep\_no*. Since “independent” here means that the chairman and the general manager are not the same person, *chg\_indep\_yes* means that either the chairman or general manager has changed. Here it just means that the general manager has changed. Similarly, *chg\_indep\_no* means that both the chairman and the general manager have changed. The results mostly fit our hypothesis. Although the coefficients of both variables are negative and statistically significant, *chg\_indep\_no* has a bigger effect on stock return synchronicity.

As for the fixed-effects model, the results are mostly different from those of the OLS model. The *chg* still has a negative, but insignificant effect. The coefficients of both *chg\_normal* and *chg\_abnormal* are negative, and not statistically significant. The result of the pair *chg\_internal* and *chg\_external* is also negative, but not statistically significant. The result of *chg\_ifagent\_yes* and *chg\_ifagent\_no* also

**Table 7** General manager-change variables and stock return synchronicity

Estimation	OLS	Fixed-effects	Random-effects
<i>chg</i>	-0.0333*** (-4.83)	-0.0043 (-0.47)	-0.0295*** (-3.65)
No. of obs.	4223	4223	4223
<i>chg_normal</i>	-0.0491*** (-3.02)	-0.0303 (-1.46)	-0.0437** (-2.34)
<i>chg_abnormal</i>	-0.0314*** (-3.10)	-0.0031 (-0.23)	-0.0272** (-2.29)
No. of obs.	4223	4223	4223
<i>chg_internal</i>	-0.0101 (-1.26)	-0.0115 (-1.03)	-0.0192* (-1.93)
<i>chg_external</i>	-0.0502*** (-5.54)	-0.0025 (-0.21)	-0.0384*** (-3.65)
No. of obs.	4223	4223	4223
<i>chg_ifagent_yes</i>	0.0126 (1.16)	-0.0291 (-1.23)	-0.0158 (-0.74)
<i>chg_ifagent_no</i>	-0.0337*** (-4.85)	-0.0044 (-0.48)	-0.0296*** (-3.65)
No. of obs.	4223	4223	4223
<i>chg_indep_yes</i>	-0.0275** (-2.40)	0.0091 (0.66)	-0.0083 (-0.68)
<i>chg_indep_no</i>	-0.0289*** (-3.31)	-0.0185 (-1.60)	-0.0410*** (-3.98)
No. of obs.	4223	4223	4223

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Note: The year dummies, industry dummies, and province dummies are included but not reported.

becomes quite different. The effect of the former changes from positive to negative, and the effect of the latter is still negative, but becomes statistically insignificant. The last pair is *chg\_indep\_yes* and *chg\_indep\_no*. The former changes from being significantly negative at the 5% level to being positive, and the latter remains negative but not statistically significant. In summary, in our opinion, there must be an unobservable factor, so that after controlling for this factor in the fixed-effects model, we have different results from those of the OLS model.

The random-effects model allows us to estimate the impact of time-invariant variables. We find that the coefficients of *chg*, *chg\_external*, *chg\_ifagent\_no*, and *chg\_indep\_no* are all negative and statistically significant at the 1% level. Nearly all of the results are consistent with those of the OLS model, which confirms our theoretical predictions.

### Results on Regional Governance Mechanisms

In this part, we investigate empirically the effects of the chosen indicators of regional governance on stock return synchronicity. We use  $R_i^2$  as the dependent variable. The independent variables include five variables of regional governance, *gov\_mkt\_rel*, *non\_sta\_econ*, *gds\_mkt\_ext*, *fct\_mkt\_ext*, and *mkt\_agt\_lgl*. Other explanatory variables include four variables of corporate governance, *b&h*, *gvnt\_ctrl*, *largest\_stake*, and *insq2\_10*; three firm-specific characteristics, *lg\_tot\_asst*, *book\_value\_lev*, and *tq*; and four regional characteristics, *lg\_pcgdp*, *fdi/gdp*, *trade/gdp*, and *ind/gdp*; together with industry dummies and province dummies as control variables.

Table 8 presents the correlation among the five variables of regional governance. The variables are highly correlated. Hence, we put each variable of regional governance separately into the regression models.

Table 9 to Table 13 present different regression results. For the OLS model, the coefficients of *gov\_mkt\_rel*, *fct\_mkt\_ext*, and *non\_sta\_econ* are negative, and the first two are statistically significant; the coefficients of *gds\_mkt\_ext* and *mkt\_agt\_lgl* are positive, but not statistically significant. These results are mostly consistent with

**Table 8** Correlation among variables of regional governance

	<i>gov_mkt_rel</i>	<i>non_sta_econ</i>	<i>gds_mkt_ext</i>	<i>fst_mkt_ext</i>	<i>mkt_agt_lgl</i>
<i>gov_mkt_rel</i>	1.0000				
<i>non_sta_econ</i>	0.7649	1.0000			
<i>gds_mkt_ext</i>	0.5285	0.6521	1.0000		
<i>fst_mkt_ext</i>	0.6870	0.8339	0.3607	1.0000	
<i>mkt_agt_lgl</i>	0.4860	0.6195	0.1226	0.7813	1.0000

our hypotheses. As for the variables of corporate governance, the coefficients of *b&h*, *largest\_stake*, and *lnsq2\_10* are all significantly negative. The variable of *gvnt\_ctrl* has an insignificantly positive effect on stock return synchronicity. The results are consistent with our hypotheses. The results of the firm-specific characteristics and regional characteristics are mostly not significant.

For the fixed-effects model, only the coefficient of *fst\_mkt\_ext* has a significantly negative effect at the 1% level. Although the coefficient of *mkt\_agt\_lgl* is negative, the t-value is only -0.15. The coefficients of three other variables, *gov\_mkt\_rel*, *non\_sta\_econ*, and *gds\_mkt\_ext* all turn out to be positive; however, the t-value is less than one. As for the variables of corporate governance, the coefficients of *largest\_stake* and *lnsq2\_10* are all significantly negative. The coefficient of *gvnt\_ctrl* has a not significantly positive effect on stock return synchronicity. The results of the firm-specific characteristics and regional characteristics are similar to those of the OLS model, i.e., they are mostly not significant.

The random-effects model allows us to estimate the impact of time-invariant variables. The coefficient of *gov\_mkt\_rel* is -0.0049, and the t-value is -1.62, which means that it is almost statistically significant at the 10% level. The effect of *non\_sta\_econ* on stock return synchronicity becomes negative again; however, it is still not significant. The coefficients of *gds\_mkt\_ext* and *mkt\_agt\_lgl* are positive, but both are not statistically significant. The effect

**Table 9** Regional governance and stock return synchronicity: Relationship between the government and the market

Estimation	OLS	Fixed-effects	Random-effects
<i>gov_mkt_rel</i>	-0.0051* (-1.87)	0.0021 (0.25)	-0.0049 (-1.62)
<i>b&amp;h</i>	-0.0377** (-2.43)	—	-0.0363* (-1.93)
<i>gvnt_ctrl</i>	0.0046 (0.71)	0.0184 (0.65)	0.0025 (0.34)
<i>largest_stake</i>	-0.0006** (-2.47)	-0.0015** (-2.16)	-0.0006** (-2.18)
<i>lnsq2_10</i>	-0.0073*** (-5.05)	-0.0096*** (-2.89)	-0.0071*** (-4.34)
<i>lg_tot_asst</i>	-5.40e-13** (-2.00)	-2.88e-11*** (-5.28)	-4.92e-13 (-1.35)
<i>book_value_lev</i>	0.0038 (0.95)	0.0072 (1.46)	0.0040 (0.99)
<i>tq</i>	-0.0510*** (-4.66)	-0.0260*** (-4.82)	-0.0452*** (-11.11)
<i>lg_pcgdp</i>	-0.0261*** (-2.76)	-0.2718** (-2.21)	-0.0282** (-2.51)
<i>fdilgdp</i>	-0.0078 (-0.05)	-0.2657 (-0.66)	-0.0551 (-0.28)
<i>tradelgdp</i>	0.0194 (1.63)	-0.0152 (-0.23)	0.0220 (1.59)
<i>indlgdp</i>	0.0152 (0.87)	0.1598 (1.45)	0.0178 (0.87)
No. of obs.	4122	4122	4122

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Note: The year dummies, industry dummies, and province dummies are included but not reported.

**Table 10** Regional governance and stock return synchronicity: Development of the non-state sector

Estimation	OLS	Fixed-effects	Random-effects
<i>non_sta_econ</i>	-0.0017 (-0.96)	0.0022 (0.35)	-0.0016 (-0.76)
<i>b&amp;h</i>	-0.0379** (-2.45)	—	-0.0365* (-1.94)
<i>gvnt_ctrl</i>	0.0046 (0.71)	0.0185 (0.66)	0.0025 (0.34)
<i>largest_stake</i>	-0.0006** (-2.50)	-0.0015** (-2.17)	-0.0006** (-2.20)
<i>lnsq2_10</i>	-0.0073*** (-5.04)	-0.0096*** (-2.87)	-0.0071*** (-4.33)
<i>lg_tot_asst</i>	-5.51e-13** (-2.04)	-2.89e-11*** (-5.28)	-5.01e-13 (-1.37)
<i>book_value_lev</i>	0.0041 (1.02)	0.0071 (1.46)	0.0042 (1.04)
<i>tq</i>	-0.0511*** (-4.65)	-0.0261*** (-4.83)	-0.0452*** (-11.12)
<i>lg_pcgdp</i>	-0.0261*** (-2.77)	-0.2749** (-2.23)	-0.0283** (-2.51)
<i>fdi/gdp</i>	-0.0193 (-0.11)	-0.2482 (-0.61)	-0.0679 (-0.33)
<i>trade/gdp</i>	0.0190 (1.58)	-0.0138 (-0.22)	0.0214 (1.53)
<i>ind/gdp</i>	0.0146 (0.80)	0.1552 (1.45)	0.0170 (0.80)
No. of obs.	4122	4122	4122

\* p &lt; 0.1, \*\* p &lt; 0.05, \*\*\* p &lt; 0.01.

Note: The year dummies, industry dummies, and province dummies are included but not reported.

**Table 11** Regional governance and stock return synchronicity: Growth of a goods market

Estimation	OLS	Fixed-effects	Random-effects
<i>gds_mkt_ext</i>	0.0005 (0.20)	0.0073 (0.97)	0.0009 (0.32)
<i>b&amp;h</i>	-0.0392** (-2.53)	—	-0.0381** (-2.02)
<i>gvnt_ctrl</i>	0.0042 (0.66)	0.0191 (0.68)	0.0021 (0.28)
<i>largest_stake</i>	-0.0006** (-2.47)	-0.0015** (-2.18)	-0.0006** (-2.16)
<i>lnsq2_10</i>	-0.0073*** (-5.04)	-0.0096*** (-2.88)	-0.0071*** (-4.33)
<i>lg_tot_asst</i>	-5.48e-13** (-2.03)	-2.88e-11*** (-5.29)	-4.97e-13 (-1.36)
<i>book_value_lev</i>	0.0042 (1.05)	0.0071 (1.45)	0.0042 (1.05)
<i>tq</i>	-0.0512*** (-4.65)	-0.0262*** (-4.85)	-0.0453*** (-11.14)
<i>lg_pcgdp</i>	-0.0263*** (-2.71)	-0.2891** (-2.33)	-0.0281** (-2.45)
<i>fdi/gdp</i>	-0.1024 (-0.58)	-0.2755 (-0.70)	-0.1460 (-0.70)
<i>trade/gdp</i>	0.0220* (1.75)	-0.0216 (-0.34)	0.0245* (1.65)
<i>ind/gdp</i>	0.0080 (0.44)	0.1613 (1.51)	0.0101 (0.48)
No. of obs.	4122	4122	4122

\* p &lt; 0.1, \*\* p &lt; 0.05, \*\*\* p &lt; 0.01.

Note: The year dummies, industry dummies, and province dummies are included but not reported.



**Table 12** Regional governance and stock return synchronicity: Growth of factor markets

Estimation	OLS	Fixed-effects	Random-effects
<i>fct_mkt_ext</i>	-0.0058** (-2.05)	-0.0163*** (-2.81)	-0.0065** (-2.11)
<i>b&amp;h</i>	-0.0376** (-2.44)	—	-0.0359* (-1.91)
<i>gvnt_ctrl</i>	0.0047 (0.72)	0.0187 (0.66)	0.0026 (0.35)
<i>largest_stake</i>	-0.0007** (-2.54)	-0.0015** (-2.13)	-0.0006** (-2.25)
<i>insq2_10</i>	-0.0073*** (-5.03)	-0.0098*** (-2.94)	-0.0071*** (-4.33)
<i>lg_tot_asst</i>	-5.57e-13** (-2.05)	-2.86e-11*** (-5.25)	-5.09e-13 (-1.39)
<i>book_value_lev</i>	0.0042 (1.06)	0.0070 (1.44)	0.0043 (1.08)
<i>tq</i>	-0.0511*** (-4.66)	-0.0259*** (-4.80)	-0.0451*** (-11.11)
<i>lg_pcgdp</i>	-0.0221** (-2.28)	-0.2608** (-2.14)	-0.0239** (-2.08)
<i>fdi/gdp</i>	0.0913 (0.51)	-0.4026 (-1.01)	0.0502 (0.24)
<i>trade/gdp</i>	0.0249** (2.07)	0.0455 (0.70)	0.0287** (2.03)
<i>ind/gdp</i>	0.0158 (0.90)	0.1694 (1.59)	0.0200 (0.97)
No. of obs.	4122	4122	4122

\* p &lt; 0.1, \*\* p &lt; 0.05, \*\*\* p &lt; 0.01.

Note: The year dummies, industry dummies, and province dummies are included but not reported.

**Table 13** Regional governance and stock return synchronicity: Development of intermediary organizations and the legal environment for a market economy

Estimation	OLS	Fixed-effects	Random-effects
<i>mkt_agt_lgl</i>	0.0017 (0.50)	-0.0006 (-0.15)	0.0010 (0.27)
<i>b&amp;h</i>	-0.0390** (-2.53)	—	-0.0376** (-2.00)
<i>gvnt_ctrl</i>	0.0043 (0.67)	0.0185 (0.66)	0.0022 (0.30)
<i>largest_stake</i>	-0.0006** (-2.47)	-0.0015** (-2.16)	-0.0006** (-2.17)
<i>insq2_10</i>	-0.0073*** (-5.04)	-0.0096*** (-2.89)	-0.0071*** (-4.33)
<i>lg_tot_asst</i>	-5.54e-13** (-2.05)	-2.87e-11*** (-5.25)	-5.02e-13 (-1.37)
<i>book_value_lev</i>	0.0042 (1.04)	0.0071 (1.45)	0.0042 (1.05)
<i>tq</i>	-0.0512*** (-4.65)	-0.0260*** (-4.81)	-0.0453*** (-11.15)
<i>lg_pcgdp</i>	-0.0288*** (-2.79)	-0.2645** (-2.11)	-0.0300** (-2.49)
<i>fdi/gdp</i>	-0.0808 (-0.50)	-0.3007 (-0.72)	-0.1133 (-0.59)
<i>trade/gdp</i>	0.0164 (1.08)	-0.0079 (-0.12)	0.0200 (1.17)
<i>ind/gdp</i>	0.0102 (0.58)	0.1540 (1.44)	0.0126 (0.62)
No. of obs.	4122	4122	4122

\* p &lt; 0.1, \*\* p &lt; 0.05, \*\*\* p &lt; 0.01.

Note: The year dummies, industry dummies, and province dummies are included but not reported.

of *fst\_mkt\_ext* on stock return synchronicity remains significantly negative in the random-effects model. The coefficients of variables of corporate governance are mostly significantly negative except for that of *gvnt\_ctrl*. The results of the firm-specific characteristics and regional characteristics are mostly not significant.

### Conclusion

We analysed empirically the impact of four variables of static corporate governance, nine variables of dynamic corporate governance, and five variables of regional governance on the stock return synchronicity of listed companies in China with the inclusion of standard control variables. We took  $R_{it}^2$  as the measure of stock return synchronicity. We used a four-year panel dataset and estimated both the fixed-effects and random-effects models. In this paper we documented some statistically strong effects of indicators of static and dynamic corporate governance and indices of regional governance on stock return synchronicity. We found fairly strong empirical support for our main hypotheses that there are negative relationships between the quality of static corporate governance and stock return synchronicity, between dynamic corporate governance mechanisms and stock return synchronicity, and between the quality of regional governance and stock return synchronicity. Consistent with theoretical predictions, we found that the following features resulted in a statistically significant and negative effect on stock return synchronicity: a high concentration of shareholdings among the second to the tenth largest shareholders, issuing shares to foreign investors, and a high stake holding by the largest shareholder. A change in chairman or general manager would also have a statistically significant and negative effect on stock return synchronicity. After decomposing the variables for changes to the chairman or general manager, we found that reasons for leaving that are related to corporate governance are more effective than reasons unrelated to corporate governance on stock return synchronicity; external successors are more effective than internal successors; taking up the position permanently is more effective than

doing so temporarily; an independent board is more effective than one that is not. With regard to the indices of regional governance, we found that the closer the relationship between the government and the market is, the higher the stock return synchronicity is; and that the better developed the regional capital market, the less the stock return synchronicity. As we have shown, the statistical significance of these effects remains robust across all specifications, although a few of them do fluctuate depending on the estimation method that is employed.

These findings have implications for listed companies, market regulators, and regional governments in China. Our study sheds light on the relative importance of various practices of corporate governance and regional governance; hence, it provides useful information for the Chinese regulatory authorities to design better codes of corporate practice that are tailored to both institutional conditions and the current level of development of capital markets in China.

### References

- Bai, Chong-en, Qiao Liu, Joe Lu, Frank M. Song and Junxi Zhang. 2004. "Corporate Governance and Market Valuation in China," *Journal of Comparative Economics*, 32(4):599-616.
- Beny, Laura Nyantung. 2005. "Do Insider Trading Laws Matter? Some Preliminary Comparative Evidence," *American Law and Economics Review*, 7(1):144-83.
- Bushman, Robert M., Joseph D. Piotroski and Abbie J. Smith. 2004. "What Determines Corporate Transparency?" *Journal of Accounting Research*, 42(2):207-52.
- Campbell, John Y., Martin Lettau, Burton G. Malkiel and Yexiao Xu. 2001. "Have Individual Stocks Become More Volatile? An Empirical Exploration of Idiosyncratic Risk," *Journal of Finance*, 56(1):1-43.
- Claessens, Stijn, Simeon Djankov, Larry H. P. Lang. 2000. "The Separation of Ownership and Control in East Asian Corporations," *Journal of Financial Economics*, 58:81-112.

- Coughlan, Anne T. and Ronald M. Schmidt. 1985. "Executive Compensation, Management Turnover, and Firm Performance: An Empirical Investigation," *Journal of Accounting and Economics*, 7(1):43-66.
- Denis, David J., Diane K. Denis and Atulya Sarin. 1997. "Ownership Structure and Top Executive Turnover," *Journal of Financial Economics*, 45:193-221.
- Fan, Gang and Xiaolu Wang. 2004. *NERI Index of Marketization of China's Provinces, 2004 Report*. Beijing: Economic Science Press. (In Chinese)
- Fox, Merritt B., Randall Morck, Bernard Yeung and Artyom Durnev. 2003. "Law, Share Price Accuracy, and Economic Performance: The New Evidence," *Michigan Law Review*, 102:331-86.
- Jefferson, Gary H., Thomas G. Rawski and Yuxin Zheng. 1992. "Growth, Efficiency, and Convergence in China's State and Collective Industry," *Economic Development and Cultural Change*, 40(2):239-66.
- Kang, Jun-koo and Anil Shivdasani. 1995. "Firm Performance, Corporate Governance, and Top Executive Turnover in Japan," *Journal of Financial Economics*, 38:29-58.
- Kaplan, Steven N. 1994. "Top Executive Rewards and Firm Performance: A Comparison of Japan and the United States," *Journal of Political Economy*, 102(3):510-46.
- Li, Kan, Randall Morck, Fan Yang and Bernard Yeung. 2003. "Time Varying Synchronicity in Individual Stock Returns: A Cross-country Comparison." Paper presented at the Global Linkages Conference organized by the International Monetary Fund, Washington, DC, 30-31 January.
- Morck, Randall, Bernard Yeung and Wayne Yu. 2000. "The Information Content of Stock Markets: Why Do Emerging Markets Have Synchronous Stock Price Movements?" *Journal of Financial Economics*, 58(1-2):215-60.
- Roll, Richard. 1988. "R<sup>2</sup>," *Journal of Finance*, 43(2):541-66.
- Shleifer, Andrei and Robert W. Vishny. 1986. "Large Shareholders and Corporate Control," *Journal of Political Economy*, 94(3):461-88.
- Shleifer, Andrei and Robert W. Vishny. 1997. "A Survey of Corporate Governance," *Journal of Finance*, 52(2):737-83.
- Tobin, James. 1984. "On the Efficiency of the Financial System," *Lloyds Bank Review*, 153:1-15.
- Warner, Jerold B., Ross L. Watts and Karen H. Wruck. 1988. "Stock Prices and Top Management Changes," *Journal of Financial Economics*, 20:461-92.
- Weisbach, Michael S. 1988. "Outside Directors and CEO Turnover," *Journal of Financial Economics*, 20:431-60.