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Lessons from Korea**

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Corporate Governance, Regulation and Globalization: Lessons from Korea

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ABSTRACT

We investigate whether the introduction of a mandated independent director system affected firm ownership structure in South Korea, where the governance system changed significantly after the 1997 financial crisis. Results indicate that foreign investors place considerable value on the appointment of independent directors. An increase in foreign ownership, associated with an improvement in the corporate governance system, occurred after controlling home bias and firm size. Further, the positive effect of an outside director system on foreign ownership was greater for independent firms than it was for conglomerates (chaebols) and their affiliates. The results are robust under a range of endogeneity tests.

JEL classification: G32; G38; F65

Key words:

Internationalization/globalization
Corporate governance in emerging markets
Foreign portfolio investment
Regulatory reform
South Korea

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Highlights

- We model Korean listed firms which have experienced governance reform
- We examine whether newly appointed outside directors affected foreign ownership
- An improvement of governance system increases foreign ownership
- The positive effect was greater for independent firms than for chaebols

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1. Introduction

A dramatic change in corporate governance system in South Korea (Korea hereafter) following the 1997 financial crisis has been drawn attention to both researchers and policy makers. Previous studies have largely shown the positive effects of corporate governance changes on firm value (Black and Kim, 2012; Choi et al., 2007; Cho and Kim, 2007; Kim and Lim, 2010; Min and Verhoeven, 2013). While these existing studies have improved our understanding of the effects of governance mechanisms on shareholder wealth, an equally important approach is to understand the effect of certain corporate governance mechanisms in attracting foreign investment. Corporate governance mechanisms, including outside directors, reduce investment risk by decreasing costs of monitoring manager's/controlling shareholder's exploitation of minority (foreign) shareholders (Shleifer and Vishny, 1997; Bebchuk and Weisbach, 2010) and business partners (Luo, Chung and Sobczak, 2009). "In (a shareholder value) environment, independent directors are more valuable than insiders. They are less committed to management and its vision. Independent directors can be more readily mobilized by legal standards to help provide the public goods of more accurate disclosure and better compliance with law." (Gordon, 2007: 1465) Improving the independence of the board has a subsequent effect of attracting foreign investors. The home bias proposition and transaction cost theory provide further support for this view. They suggest that foreign investors prefer firms that have governance systems similar to those in their own countries (Kang and Stulz, 1999; Dahlquist, Pinkowitz, Stulz and Williamson, 2002; Karolyi and Stulz, 2003; Ke, Ng and Wang, 2010; Bell, Filatotchev and Rasheed, 2012). The existence of a home bias is to the disadvantage of developing economies as it is consistent with under investment from developed economies and thus inhibits the expansion of globalization.

In the context of Korea, we investigate whether a dramatic change in the corporate governance system affected foreign equity ownership. In particular, we investigate whether foreign investors

responded positively to the appointment of outside directors, indeed a core element of the changes to the corporate governance system following the financial crisis.

In the aftermath of the 1997 Asian Financial Crisis, the Korean government implemented a series of regulatory reforms that had a significant impact on corporate governance structures and increased the independence of boards of directors. The objective, as suggested by corporate governance literature (Al-Malkawi et al., 2014; Adams, 2011; Armstrong, Core and Guay, 2012), was to strengthen corporate governance systems as a means to improve managerial monitoring, transparency and accountability. In parallel with these new regulations and changes was the removal of restrictions on foreign ownership of Korean companies.

The reforms in Korea have been the catalyst for numerous studies. Solomon, Solomon and Park (2002) report the results of a questionnaire survey that indicates strong support for improvement in corporate governance and accountability among a sample of fund managers. Choi, Park and Yoo (2007) study Korea over the period 1999 to 2002 and find the presence of outside directors and the level of foreign ownership impact positively on firm valuation. Other studies looking at firm value impacts include Black and Kim (2012), Cho and Kim (2007), Kim (2007), Min and Smyth (2014) and Min (2013).

However, none of these studies explore the effect of outside directors on foreign ownership. Two studies come closest to remedying this omission. Rhee and Lee (2008) find that foreign ownership increases when outside directors have advanced foreign degrees, affiliations with government organizations and experience in the relevant industry. Kim, Eppler-Kim, Kim and Byun (2010) show that diffuse ownership concentration and a firm's efforts to implement better corporate governance lead to higher levels of foreign ownership.

Our estimation results indicate that an improvement in corporate governance, measured by the appointment of outside directors, helps to attract more foreign equity ownership. The *within-estimate* shows a strong positive association between the two variables. We demonstrate further that for our study period, causality runs from the change in board independence to the increase in foreign investment. We also demonstrate that the positive effect of the outside director system on foreign

ownership is greater for independent firms than it is for chaebols, suggesting that foreign investors discount the effectiveness of outside directors for chaebols. The increase in foreign ownership is also closely associated with size, which may proxy for the home bias factor. Our findings are important in suggesting prescriptions for success in the process of globalization.

Our paper contributes to international corporate governance literature in a number of ways. First, we relate corporate governance to foreign portfolio investment and further relate that link to its positive impact on globalization. Second, existing studies focus largely on developed economies with stable corporate governance systems. We examine the effect in an emerging market of substantial changes to governance structure on foreign ownership. We show empirically that an improvement in corporate governance systems can facilitate capital mobility across countries. This finding is particularly relevant for emerging markets where capital costs in domestic markets are generally higher than in international markets. Third, we show that the link between improved corporate governance and foreign investment is not demonstrated for chaebol companies, where there is likely to be concern about the potential for influence by independent board members. Fourth, we carefully deal with the potential endogeneity in the relationship between improvements in the independence of boards and increases in foreign investment.

The remainder of this paper is organized as follows. The following section reports changes in the regulatory reforms focusing on the introduction of outside director system and deregulation on foreign equity ownership. Then, we document existing theories to formulate empirical hypotheses. Section 4 explains methodology including data descriptions. Main estimation results combined with a number of robustness check and endogeneity tests are reported in section 5. The final section contains conclusion.

2. Regulatory reforms

2.1 Changes in the corporate governance system

There are three distinctive features of the government-initiated regulatory reforms of the corporate governance system in Korea. First, the restructuring of board of directors (BOD) composition required

the appointment of outside directors for publicly traded firms. Before the reforms, board members in Korea were typically appointed as part of a seniority-based promotion scheme (Kim and Briscoe, 1997), which is similar to the situation in Japan. This tradition had negative implications for corporate monitoring by boards. Board size could become too large to be efficient, resulting in coordination failures, as confirmed by Yermack (1996) and Eisenberg, Sundgren and Well (1998). The promotion-linked board structure also often results in another layer of hierarchy within the BODs. Thus, the check and balance mechanism could fail to work, and board members could tend to become a rubber stamp for management decisions.

The amendment of the Listing Act in February 1998 requires companies listed on the Korea Exchange to have at least 25 percent outside directors on the BOD. To insure the independence of outside directors, the Act clarified the conditions for outside directors by excluding current and former employees of a company, family or friends of controlling shareholders (CSHs), and anyone who had a business relationship with the firm/business group.

Further to this statutory requirement, the announcements of a Code of Best Practice for Corporate Governance in September 1999 and February 2003 influenced amendments to the Securities and Exchange Act in March 2001 and December 2003 respectively. Large listed corporations with assets greater than 2 trillion won (approximately 2 billion USD) must establish an Audit Committee and an Appointment Committee under the BOD with its members comprised mainly of outside directors. The 2001 amendment also requires that no fewer than half the board members of these large firms be outside directors.

Second, the reform of the corporate governance system was government-driven, with the assistance of the International Monetary Fund and the International Bank for Reconstruction and Development who supplied bail-out funds following the 1997 crisis.

Third, the change in the governance system was from a relationship-based insider model towards an outsider model. Seeing the traditional relationship-based model as one cause of the 1997 crisis, the Korean government opted to move closer to the Anglo-American system.

2.2 Changes in foreign ownership restrictions

In addition to the reform of the corporate governance system to strengthen the monitoring function of boards and protect minority shareholders' interests, the government also relaxed its restrictions on foreign investment.

Foreign investors play a particularly important role in emerging markets because their participation promotes development by supplying capital, spill-over of technology and managerial know-how, and competition to improve the efficiency of the markets (Bekaert and Harvey, 2000; Bekaert, Harvey and Lundblad, 2001).

Korea first relaxed its restriction on foreign portfolio investment (FPI) in 1992 to allow foreign investors to own (in aggregate) up to ten percent of most listed companies. The reforms in May 1998 further relaxed regulations governing foreign investment in Korean firms, except for those industries that involve national security concerns or cultural considerations, such as the mass media. Foreigners could purchase up to 50 percent of the outstanding shares of most public corporations.

The data on foreign investment, shown below in Table 1, indicates steadily increasing investment by foreigners over our sample period of 1999 through 2003. The increase in foreign investment unfolded progressively, so that the investment decisions would have reflected full consideration of the developing improvements in corporate governance.

3. Theory and hypotheses

Prior research shows that investors exhibit a 'home bias'; they are reluctant to make cross-border investments (Dahlquist, Pinkowitz, Stulz, and Williamson, 2003; Karolyi and Stulz, 2003). While there can be diversification benefits to foreign investments, the costs of international investment are greater due to the complexity of the foreign environment associated with differences in culture, language, political, and regulatory backgrounds and limited human networks. Foreign investors are at an informational disadvantage to local investors (Ahearne, Grier, and Warnock, 2004; Chan, Covrig, and Ng, 2005). The information asymmetries are likely to influence investment decisions of foreign investors, with the possibility that they will underinvest in foreign stocks because they do not

expect to receive a sufficient return to compensate for their higher costs and risk. It follows that investment from foreigners is likely to increase when the costs caused by asymmetric information decrease (Dahlquist, Pinkowitz, Stulz, and Williamson, 2003).

The literature also indicates that foreigners tend to invest more in firms with good governance to manage their investment risk (Shleifer and Vishny 1997; La Porta, Lopez-de-Silanes, Shleifer, and Vishny: LLSV, 2000, 2002; Aggarwal, Erel, Stulz, and Williamson 2008;). The goals of corporate governance include protection of minority shareholders' interests and support for optimal performance. Foreign investors are more likely to be dependent on an effective corporate governance system than local investors, partly because foreign investors are usually minority shareholders. When international investors buy shares in a company, they face the risk that they may fail to realize an appropriate return on their investment because of expropriation by local corporate managers or CSHs.

The reform of the corporate governance system in Korea should change the risk to investors for a number of reasons. First, the new corporate governance system (including the appointment of outside directors) should increase the demand for capital. Castro, Clementi and MacDonald's (2004) model illustrates that more effective corporate governance is likely to increase risk-sharing between insiders and investors in the company and thus increase the demand for capital.

According to LLSV (1997, 1998), common law is better able to protect minority shareholders than civil law. Wu, Li and Selover (2012) make a similar point based upon modes of governance they categorize as rule-based. The reform of the corporate governance system following the 1997 crisis resulted in the adoption of more common law (rule-based) components than in Korea's traditional civil law system. The improved protection of minority shareholders would reduce (global) investment risk of expropriation, thereby increasing the supply of foreign investment.

We expect the reforms of the corporate governance system in Korea to increase the independence of boards of directors. We also expect the relaxation of share ownership restrictions to increase foreign investment. Of interest is whether a firm's appointment of outside directors attracts increased investment from foreign investors.

These two significant changes happened contemporaneously,¹ creating potential econometric issues in our study of a casual relationship between changes in the two (Reeb, Sakakibara and Mahmood, 2012). We employ a series of tests and controls to deal with endogeneity, which we discuss in a later section. Although tests to control for endogeneity are appropriate, we believe the issue is not as serious as it might appear. The environment of the changes is such that causality should predominately run from the governance changes to increased FPI.

Changes in a country's corporate governance system are generally evolutionary rather than revolutionary, as it involves the rearrangement of institutional settings and the business culture. However, the recent experience of Korea is an exception; it happened very quickly. Further, most studies of corporate governance involve cases where companies choose to make changes, and thus these are also evolutionary. In our study, the changes were mandated by the change in regulations, although the timing of changes was somewhat discretionary, and companies were free to appoint more independent board members than the required minimum.

Bae and Goyal (2010) report a substantial increase in FPI upon the relaxation of restrictions in 1992, with the level of foreign ownership peaking at 5.95% in 1994. It then declined to less than 5% by 1997, well below the 10% restriction level. Therefore, it does not appear that there was significant pent-up FPI demand in 1998 when the ownership restrictions were further relaxed.

In our test period, the level of independent board members and the level of foreign investment both increased. The changes to corporate governance were not directly attributable to FPI. Therefore, we hypothesize directional causality:

Hypothesis 1: The changes in foreign ownership are in positive response to the appointment of outside directors.

3.1 Chaebols versus independent firms

¹ The sharp depreciation of the Korean won against major currencies following the Asian crisis generated a wealth effect and thus improved the bargaining power of foreign investors (Froot and Stein 1991; Aguiar and Gopinath 2005). Our research design includes year-specific effects to capture exchange rate fluctuations which are homogenous across industries.

Bebchuck and Weisbach (2010) suggest that the board's controlling function is even more important for a firm where there is a controlling shareholder. These controlling owners have the power and incentive to influence strategic decisions by participating in or personally monitoring management. This arrangement is prone to principal-agent problems and characterises Korean business groups (i.e., chaebols). Indeed, Bae, Kang and Kim's (2002) empirical study reports tunnelling behaviour of chaebols with resultant wealth transfers from minority shareholders to CSHs.

Chaebols contribute to the economy by providing internal capital markets and risk taking (i.e., long-term project investments), particularly during the early stages of development. Despite the importance that chaebols have in the economy, they may discourage foreign investment. Foreign investors are at an informational disadvantage to CSHs who, in most cases, have voting rights in excess of cash flow rights (La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 2002) and have strong control over the groups and their affiliates in terms of strategic investment decisions and executive appointments. Even with the presence of independent directors on the board, foreign investors may still incur additional costs to bridge the information gap between themselves and CSHs. The co-existence of chaebols and independent firms is an important characteristic of the Korean economy. We expect foreign investors to find the move to more independent directors to have less impact on chaebols than on independent firms.

Hypothesis 1a: The positive association of foreign ownership with the appointment of outside directors will be smaller for chaebol affiliates than for independent firms.

3.2 Exposure to asymmetric information

Foreign investors prefer to invest in firms they are familiar with and have a greater ability to obtain information about. A rationale behind this home bias behaviour is the transaction costs caused by asymmetric information between domestic and foreign investors (Young and Guenther 2003) and differences in corporate governance (Dahlquist, Pinkowitz, Stulz, and Williamson, 2003; Klapper and Love 2004). Foreign shareholders are often disadvantaged in overseeing executive management and/or CSHs' actions and legal disputes with local residents. High information costs due to increased

transaction costs discourage investment by foreign investors. Therefore, the sensitivity of foreign investors to the transaction costs associated with a company's corporate governance will be more significant than that of local investors.

Hypothesis 2: Firms with lower asymmetric information problems will have higher foreign equity ownership.

4. Methodology

4.1 Data and sample

We obtained data from the Korea Listed Companies Association (KLCA) database, which has the most comprehensive coverage of listed companies on the Korea Exchange. Our sample covers the period from 1999, when the KLCA database began to publish information about outside directors, through 2003.² This five year period suits our analysis.³ The sample period overlaps the most dramatic changes in the corporate governance system in Korea as described above. Also, it avoids the direct impact of the global financial crisis. The classification of chaebol affiliates follows the Korea Fair Trade Commission classification. Excluding financial firms, our final sample has 2,842 firm-years.

Table 1 provides descriptive statistics on the ratio of outside directors to total board members and ownership of foreigners. The average ratio of appointed outside directors to total board members for the listed companies increased during the sample period from 10.47 percent in 1999 to 31.23 percent in 2003.

Table 1 goes about here

During this period, foreign investors were the third largest investor group, following individual households (61.74 percent) and other business corporations (20.35 percent).⁴ FPI increased 60%, from 5.82 percent in 1999 to 9.26 percent in 2003.

² The study reported here was conducted with another study on bank ownership. 2003 was the most recent year that bank ownership variables were available when we finalized the data in February 2011.

³ Studies such as Kim, Eppler-Kim, Kim, and Byun (2010) and Choi, Park, and Yoo (2007) also focus on the same sample period.

⁴ Shares owned by individual households were the largest proportion, which is common in emerging markets (World Bank 2004) but declined from 64.6 percent in 1999 to 58.5 percent in 2003. This declining trend is

Ownership by other business corporations typically takes the form of circular interlocking shareholdings, creating a disparity between CSHs' voting rights and cash flow rights. In contrast to most transition economies, the consistently low level of shares held by government and public enterprises is due to the extensive privatisation process in Korea. Securities companies and insurance companies have not played a major role in the share market in Korea.

4.2 Ownership by foreigners

We consider the following unrestricted baseline model for foreign ownership (Y_{it}), which we measure as the foreigners' share of a company's total equity shares.

$$\begin{aligned}
Y_{it} = & \text{constant} + \beta_1 \text{Outside}_{it} + \beta_2 \text{Book2Market}_{it} + \beta_3 \text{Dividend}_{it} + \beta_4 \text{Leverage}_{it} \\
& + \beta_5 \text{FinanDistr}_{it} + \beta_6 \text{ShareLiquid}_{it} + \beta_7 \text{CurrentRatio}_{it} \\
& + \beta_8 \text{CSHs}_{it} + \beta_9 \text{CrossFirm}_{it} + \mathbf{D}_{jt} \lambda_{jt} + \boldsymbol{\omega}_t v_i + \theta_t + \varepsilon_{it}
\end{aligned} \tag{1}$$

The ratio of outside directors to total board members (Outside) is our measure of corporate governance. We chose this variable for two reasons. First, the introduction of the outside director system was one of the material changes following the 1997 crisis and is similar to the strengthened requirement for independent directors in the US following the Sarbane-Oxley Act of 2002. Second, the outside director data published by KLCA is less susceptible to measurement error than survey-based index numbers for overall quality of corporate governance.

Froot and Stein (1991) demonstrated that exchange rate movements in a particular year are an important determinant of foreign investment. Aswicahyono and Hill (1995) also showed that industrial organization factors are important determinants of foreign investment. Assuming that exchange rate effects differ at the industry level, we include (SIC-2 digit) industry-year-specific effects, \mathbf{D}_{jt} , to control for the exchange rate effect and industrial organization factors. $\boldsymbol{\Omega}_t \equiv \{0, 1\}$. Thus $\boldsymbol{\omega}_t \equiv 0$ and $\boldsymbol{\omega}_t \equiv 1$ refer to the OLS estimator and the unobserved effects panel data model respectively. Given that $\boldsymbol{\omega}_t \equiv 1$, v_i shows the firm-specific persistent (unobserved) heterogeneity affecting the dependent variable other than included regressors. Corporate culture and managerial

similar to the experience in the UK and Japan, although Korean individuals still hold a much higher proportion than individuals in those countries.

style are typical examples. An advantage of this unobserved effects model is that the Within estimator can control for firm-specific, time-invariant unobserved heterogeneity, which could be correlated with the included regressors. This resolves endogeneity bias caused by the omitted variable. Θ_t controls for the year-specific effect (i.e., T-1 dummies), which is largely to control for economy-wide macroeconomic variables.

A good corporate governance system requires more than just the appointment of outside directors (Duchin, Matsusaka and Ozbas 2010). If we assume that the contribution of outside directors is a function of the cost of acquiring information, a complex ownership structure among affiliates would reduce the effectiveness of outside directors. We therefore include two variables. First, we include controlling shareholders' ownership (CSHs), calculated by the number of CSHs' shares divided by the total number of issued shares. Bebchuk and Weisbach (2010) argue that the possibility of CSHs' expropriation at the expense of minority shareholders in a family business group with concentrated ownership is even greater than the risk of an executive manager's private consumption in a diffused firm. The second variable is cross-firm shareholding (CrossFirm), calculated as the number of shares owned by other business corporations divided by the total number of shares issued. As described above, cross-firm shareholding may be a barrier to the operation of the market, and thus the expected signs of CSHs and CrossFirm are negative.

Leuz, Lins and Warnock (2009) suggest that book-to-market, dividends and leverage are significant factors in explaining FPI. We include the book-to-market ratio (Book2Market), calculated as the book value per share over the year-end market price, and dividend payout ratio (Dividend), calculated as cash dividend divided by net profit. These two variables also proxy for growth. Miyajima and Kuroki (2008) suggest that financial distress factors are important determinants. We therefore include both short-term and long-term financial distress variables. We measure long-term financial distress (Leverage) as total liabilities divided by total book value of assets. We measure

short-term financial distress with a binary variable equal to one if a firm had losses for two consecutive years and zero otherwise (FinanDistr).⁵

Market liquidity could also be an important consideration for foreign investors. Tesar and Werner (1995) report that the turnover rate on international equity investment is high, both when compared with the turnover rate in the investor's home country and when compared to the market for the foreign security. Badrinath, Kale and Ryan (1996) and Falkenstein (1996) suggest that institutional investors prefer shares with higher market liquidity and lower return volatility. We include cash-convertability of investment, measured by the total value of shares traded over a year divided by the number of shares outstanding (ShareLiquid) and firm stability measured by the ratio of current assets to current liabilities (CurrentRatio).

5. Results

We present estimation results in Table 2. Column (1) shows OLS estimates without considering firm-specific unobserved effects; that is, the value of ω_i in equation (1) is zero. The remaining estimation results employ panel data analysis after switching the value of ω_i to unity. For estimation purposes, we first treat the firm-specific variable v_i as an (unobserved) independent variable and then apply the Within estimator method. The estimates are in columns (2) through (4). As a robustness check, we also treat the firm-specific variable as a part of residuals and use the (GLS) random effects estimator as shown in the last three columns.⁶

The results in Table 2 support research hypothesis H1. The coefficients of the outside director variable are consistently significant with the expected signs, regardless of model specification. We particularly focus on the Within estimate results (columns 2-4) for our analysis.⁷ The estimated coefficients imply that an increase in outside directors/board members from the low to the high

⁵ We find symmetric results when we use a profitability variable (Return on Assets) with slightly less statistical significance.

⁶ These panel data analyses have an advantage over OLS because they can control for confounding caused by unobserved firm-specific effects. However, the random effect estimator relies on the assumption of no correlation between this unobserved effect and the included regressors.

⁷ The coefficient of outside directors in the OLS result is overestimated compared to the firm-specific panel models. This suggests possible correlation between the unobserved firm-specific effects such as management style or corporate culture and the included regressors.

quartile would raise foreign equity ownership by 20 percent ($=0.041*(33.3-0)/7.06$). This finding suggests the effect of outside directors on foreign investment is both statistically and economically significant. These estimated coefficients for outside directors remain intact even when we control for variables (i.e., CSHs and CrossFirm) that influence the effectiveness of outside directors.⁸ This outcome suggests that foreign investors place value on the appointment of outside directors.

Although there are a few significant results, none of the control variables are consistently significant. In contrast to Grinstein and Michaely (2005), our estimation results do not support the proposition that foreign investors are sensitive to dividend payouts.

Table 2 goes about here

To address the issue of omitted (time-invariant) variable that causing endogeneity problems and estimation bias, our analysis focuses on the fixed effects panel estimations (i.e., models 2-4 in Table 2) and OLS estimations are only for reference in the following discussions.

5.1 Reduction in outside directors and ownership

We next consider whether the effect on foreign ownership of changes in outside directors is symmetrical. If a company reduces its representation of outside directors, we expect a reduction in foreign ownership. We use equation (1) but replace Outside with a binary variable set to one if the number of outside directors declined and zero otherwise.

As expected, the coefficient on the variable is negative and marginally significant (at the ten percent level). This result (unreported) indicates that a reduction in the number of outside directors negatively affects foreign ownership. We interpret this finding as providing additional support for the empirical hypothesis H1.

5.2 Chaebols versus independent firms

Table 3 reports the effects of governance on foreign equity ownership for chaebol affiliates and independent firms respectively (Hypothesis H1a). Chaebol is a binary variable equal to 1 if a firm

⁸ In unreported results, we expanded equation (1) to include ‘beta’ from the Capital Asset Pricing Model (using data for the previous 60 months) and standard deviation of returns to proxy for risk. Neither of the variables was significant. The average (median) beta for 1999-2003 was 1.12 (1.08).

belongs to business groups as defined by the Korea Fair Trade Commission in 2002 and 0 otherwise. The estimation results support our hypothesis. The estimated coefficients of the interaction variable between Chaebol and Outside are not significant irrespective of model specifications by fixed effects estimations (models 2-4 in Table3). These fixed effects estimations do not report time-fixed dummy variable (i.e., Chaebol variable) because the Within estimation method focuses on the variation from the mean value and thus the time-invarying variables are removed in estimation process. Therefore, we include OLS estimation in model 1. Interestingly, the estimation of this model 1 implies that foreign investors prefer chaebols to stand-alone firms when they consider investment portfolio. However, the negative sign on the interaction variable, together with positive signs on Outsider, suggests that this positive effects of the appointment of outside directors is attenuated for the affiliates. Further, we examine the same models splitting the observations into two samples: chaebols and independent firms. We find (unreported) that the corporate governance variable (Outside) for chaebols is not significant in any model. By contrast, the governance variable is positive and significant for the independent firms irrespective of model specifications. This suggests that foreign investors regard the effectiveness of outside directors more highly for independent firms than for chaebol affiliates.

Table 3 goes about here

5.3 Home bias proposition and foreign investment

In line with transaction cost theory and observed home bias, our research hypothesis H2 suggests that foreign investors will invest in firms in a way that minimizes the transaction costs associated with asymmetric information and complexity in international business. Leuz, Lins, and Warnock (2009) suggest that firm size is significant in explaining foreign investment. Dahlquist, Pinkowitz, Stulz, and Williamson (2003) provide results consistent with home bias being a function of factors that are related to size at a firm level. To examine hypothesis H2, we consider the size of the firm, calculated by the natural logarithm of total assets in thousand won (\ln_{asset}), as a proxy for home bias. While this measurement is popular with empirical researchers, we also test two other variables: the natural

logarithm of market value of equity in thousand won ($Lnequity$); and the natural logarithm of sales in thousand won ($Lnsales$) as suggested by Caplow (1957).

The results in Table 4 support the home bias proposition for foreign investors, particularly when log of assets (columns 1-2) or log of equity value (columns 3-4) proxy for the size of the firm. The magnitude of the coefficient of firm size in our estimation of 3.657 implies that the elasticity of foreign ownership with respect to $Lnasset$ is about 0.52 ($=3.657/7.06$), which is similar to the findings of Leuz, Lins, and Warnock (2009) for 29 selected countries, Tesar and Werner (1995) for Sweden, and Kang and Stulz (1997) for Japan.

In addition, the results in Table 4 indicate that research hypothesis H1 is robust even when we control for the home bias of foreign investors'. The estimated coefficients of the corporate governance variable are consistently significant regardless of model specifications. The magnitudes of the coefficients are also similar (models 1-3) or smaller (models 4-6) than those estimations without controlling for the home bias factor in Table 2.

Table 4 goes about here

5.4 Further analysis

5.4.1 Corporate governance, firm value and foreign ownership

In addition to the static effect through reduced risk, better corporate governance may lead to a dynamic benefit and enhance firm value. Better investor protection can improve a firm's ability to raise external financing and reduce the cost of that financing. Therefore, investor protection can have a positive effect on growth, as witnessed by the policy recommendations of the World Bank, the International Monetary Fund and the European Bank for Reconstruction and Development (Castro, Clementi, and MacDonald, 2004). Enhanced productivity is a state variable that leads to dynamic growth. The corporate governance literature suggests that better governance will positively affect firm productivity by providing managerial incentives to improve allocative efficiency, input combination and productivity-enhancing investment at a lower capital cost (Coffee, 1984; Doidge, Karolyi and Stulz, 2007).

We consider both Tobin's Q and Productivity variables in the unrestricted baseline model. We expect Tobin's Q and Productivity to capture firm value from the financial and real perspectives. We calculate Tobin's Q as market value of equity plus book value of debt divided by book value of assets. To overcome endogeneity problems arising from the OLS method, we estimate firm-level productivity following Levinsohn and Petrin (2003). The advantage of Levinsohn and Petrin's method, which is a modification of Olley and Pakes (1996), is that estimated productivity is free from endogeneity problems. It also avoids the discontinuity problem associated with the Olley-Pakes method (detailed explanation available from authors).

Tables 5 and 6 show panel estimations for fixed effects (i.e., models 2-4 in Table 2) and indicate that the significance of the corporate governance variable remains largely intact even when we control for firm value and performance. Both Tobin's Q in Table 5 and Productivity in Table 6 have the expected signs and are significant at the one percent level irrespective of model specifications.

This finding implies that foreign investors value the outside director system itself, although firm value is also another important determinant of their investment decisions. Further, the magnitudes of the estimated coefficients of Outside in Tables 5 and 6 are somewhat similar for fixed effects estimation in Table 2. Considering that the estimated coefficients of Outside in Table 2 capture the total effects of improved governance including the indirect effects (i.e., confounding through firm value), these similar magnitudes of the estimations suggest the positive improvement of governance-led firm value.⁹ This finding suggests that foreign investors will prefer to purchase shares in those firms that are large and have improved corporate governance.

Tables 5 and 6 go about here

5.4.2 Endogeneity issues

In our discussion leading to our hypotheses, we explained that the environment of our test period was such that the causality between changes in FPI and in corporate governance was likely to be with

⁹ Note that both Outside and firm value have positive signs, and therefore the smaller size of net (i.e., direct) effects illustrates a positive association between the two variables. Note also that the appointment of outside directors is largely stimulated by government regulation rather than by improved firm value. We do not estimate the interaction variable between Outside and firm value because interaction variables between continuous variables are difficult to interpret.

the increases in independent board members. However, it is still appropriate to conduct tests that will statistically bolster our expectations based upon institutional factors.

We employ a number of tests to examine the casual effect of changes in the corporate governance of companies. The causality issue becomes confounded if there is any (unobserved) third variable simultaneously affecting regressor(s) and response variables. Firstly, we consider bias caused by any time-fixed omitted variable. We have addressed this omitted variable bias by fixed effect panel models, where $\omega_i \equiv 1$ in our models (1)-(3). In estimation, the ‘differencing’ method eliminates those time-invariant fixed effects and thus removes the confounding effects.

Reverse causality could still be an issue. To address this concern we employ: (1) an instrumental variable approach, (2) a system approach and (3) a matching method. While the instrumental variable approach is a work-horse, we present all three estimations because each method has its own merits and limitations.

5.4.2.1 Instrumental variable approach

We use a panel instrumental variable model to remove confounding effects associated with time-persistent firm specific effects (v_i) as well as reverse causality. Our estimation models (1)-(3) are differenced first to remove the fixed effect v_i and then address any remaining endogeneity influences.

The regulations require listed firms to have at least 25 percent outside directors on their BOD. However, we observe variations across firms, indicating possible endogenous components. High foreign ownership, for example, could cause a high ratio of outsiders to insiders on a BOD. An endogeneity problem is more likely to arise if the appointment of outsiders exceeds the statutory requirement. We call this excessively appointed outside directors (Outside_excess).

Columns (3)-(5) in Table 7 report estimation results by fixed effect panel instrument. Our main variable (Outside_excess) is qualitatively the same as the baseline estimations in columns (2)-(4) in Table 2. In estimation, we use lagged inside board member as an excluded instrument. A valid instrumental variable requires high correlation with the suspected endogenous variable (i.e., outsider) and no correlation with the dependent variable (i.e., foreign equity ownership). Existing literature indicates that inside board members in Korea have traditionally been appointed by seniority-based

rules (Kim and Briscoe, 1997). Thus, inside board members should be uncorrelated with foreign ownership. To comply with the amended Listing Act, however, all listed firms are to appoint outside directors based on their board size. This means inside board member numbers should be correlated with the appointment of outsiders. In addition to this economic justification of the instrument, our fixed effects estimation (with year-effects) shows the estimated coefficient of lagged inside board size on outsider was 0.365 (p-value=0.017) and on foreign ownership was 0.008 (p-value=0.908) (not reported).

Table 7 goes about here

We consider the system GMM estimation for the dynamic panel model to capture foreign multinational companies' global investment strategy. Foreigner investment decisions in Korea are likely to be a part of their global investment strategy. Foreign investors' change in corporate ownership is a function of the difference between the current ownership and ownership in the previous year. We include an autoregressive of the dependent variable in the estimation model. Estimation results in Table 7 are based on the system GMM method (Arellano and Bover, 1995; Blundell and Bond, 1998; Roodman, 2006). The results confirm that our main findings are robust. The table illustrates that the estimated coefficients for the autoregressive dependent variables for foreign ownership ranged between the upper bound as indicated by OLS estimation (column 1) and the lower limit by fixed estimator (column 2). The possible endogenous variable *Outside_excess* remains significant. We regard the lagged dependent variables, as well as *Outside_excess*, *Dividend* and *Leverage*, as endogenous variables in this system GMM estimation. The Hansen and Arellano-Bond statistics also indicate that the instrumental variables used for the estimation are valid, given the absence of autocorrelation in the first order.

5.4.2.2 System estimation models

Table 8 reports estimations by simultaneous equation methods – Seemingly Unrelated Regression (Columns 1-2) and Structural Equation Model (Column 3-5). Foreign ownership (*Foreigners*) is the dependent variable in the first equation as presented on the upper panel, and excessive outside directors (*Outside_excess*) is the dependent variable in the second equation on the lower panel.

$$ForeignOwnership_{i,t} = f(Outside_excess_{i,t} + Others) + \varepsilon_{1,i,t} \quad (2)$$

$$Outside_excess_{i,t} = f(ForeignOwnership_{i,t} + Others) + \varepsilon_{2,i,t} \quad (3)$$

Included regressors (Others) for the foreign ownership in equation (2) are the same as in Table 2, whereas Others in equation (3) include cross firm ownership, CSH's ownership and lagged insiders (L.Insider).

Table 8 goes about here

Estimation results indicate that all p-values of Outside_excess in the upper panel for equation (4) are positive and significant at conventional levels. This result supports our main finding even when we address the possible endogeneity caused by simultaneity bias.

Model (1) of our SUR tests excludes Outside_excess in equation (3) and excludes Foreigners in equation (4). Model (2) includes all the variables. As the SUR name indicates, the upper and the lower panel equations seem to be unrelated unless correlation between the residuals exists due to the shared variables (i.e., CrossFirm and CSHs). Breusch-Pagan statistics imply that correlation between residuals in model (1) is significant, whereas this correlation is not significant when we include Outside_excess in the Foreigners equation.

In contrast with SUR, the SEM specifications (Columns 3-4) explicitly include Foreigner and Outside_excess. We report Huber-White adjusted p-values in columns (3)-(4) of the SEM after relaxing the homogeneity assumption of SUR estimation. Significance of p-values of covariance in model (3) justifies SEM models allowing correlation between residuals.

5.4.2.3 Matching methods

Matching methods often examine the causal effects of changes in policies or economic shocks by identifying counterfactuals of treatment groups (Lemmon and Roberts, 2010; Roberts and Whited, 2013). The treatment group are firms that complied with the changes in regulation. This is a binary variable equal to 1 if a firm appoints any additional outside director(s) and zero otherwise (columns 1-2 in Table 9). Alternatively we define the treatment equal to 1 if a firm appointed outsiders to more than 25 percent of the BOD and 0 otherwise (column 3-4). Average treatment on the treated (ATT)

refers to the causal effect of the treatment/event on the treatment group. We employ the Propensity Score method. The propensity score, estimated by a probit model, is the probability of receiving the treatment/event. We use a kernel estimate with the Gaussian kernel and nearest-matching with 5 matched number. In an unreported table, calliper estimation with radius of 0.25 showed similar results. We also confirmed similar results when we use the epanechnikov kernel and nearest number 3-5 for robustness checks. In estimation, replacement is allowed to improve efficiency.

Table 9 goes about here

Estimation results (ATT) in Table 9, using the propensity score matching method, report evidence that the causal effect of the appointment of outside director on foreign ownership is positive and statistically significant. Average magnitude of the causal effects from columns (3)-(4) is larger than those from columns (1)-(2) and more significant. This is as expected because the causal effect in columns (1)-(2) captures only any additional appointment of outside directors whereas columns (3)-(4) captures excessively appointed outsiders.

One of the advantages of this matching method is that we do not need to find excluded instrumental variable(s). A cost of the propensity score method is that it relies on two (strong) assumptions: conditional independence and overlapping (i.e., no zero-support) (Wooldridge, 2010: Ch.21). The total number of common support in row 3 in Table 9 indicates that our observations between treatment and control groups are overlapping substantially. The Rosenbaum bound for the difference-in-response variable is to check the conditional independence (DiPrete and Gangl, 2004). It is a sensitivity analysis and provides evidence of how robust the estimated ATT is against bias due to an unobserved confounder. Statistics for Rosenbaum bounds in Table 9 show mixed results. Results in columns (1) and (2) show that the upper and lower bound is persistent with similar values up to $\Gamma = 1.4$, implying robustness of estimated ATT. In contrast, the rest of the Rosenbaum bounds statistics in Table 9 are sensitive to a small change in the value of Γ .¹⁰

¹⁰ We also test the reweighting method. The coefficient of treatment is significant only when the treatment is defined as additional appointments.

6. Conclusion

Our study of regulatory changes in Korea contributes to the existing literature in a number of ways. We investigate the relationship between changes in corporate governance systems, specifically increases in the percentage of outside members on companies' boards of directors, and foreign ownership.

Our results suggest that foreign investors place considerable merit on the appointment of outside directors. The estimated coefficients imply that an increase in independent directors on a company's Board of Directors attracts foreign portfolio investment. As foreign investment is strongly tied to globalization, our results show that corporate governance changes can stimulate globalization. The estimated coefficients for outside directors remain intact even when we control for variables that would impact on the effectiveness of outside directors. We also confirm the robustness of this finding with a variety of tests including finding that the influence of governance on FPI is symmetrical. A reduction in the number of outside directors decreases FPI.

An important contribution to the literature is our extensive tests to exclude endogeneity as an influence on our results. We first explain why we believe the institutional and investment environments at the time of our study strongly support that causality should be from the increases in independent board members to increases in FPI. We then conduct a series of tests to show that our results are robust to these tests.

We investigate the impact of governance changes on foreign investment in chaebols. The governance variables are significant for independent firms irrespective of the model specifications we test, whereas those variables are not significant for chaebols. This suggests that foreign investors place greater value on the effectiveness of outside directors for independent firms than for chaebol affiliates, where the chairman is particularly influential.

In a further extension, we show support for the home bias proposition for foreign investors. In line with the existing literature, foreign ownership elasticity with respect to the size of the firm is about 0.52. In addition, the significance of the corporate governance variable is largely intact even when we control for firm size.

The implication of our findings for globalization is that an improvement in the corporate governance system can facilitate capital mobility across countries. These findings are particularly important given that some (emerging) markets where investor protection is especially weak are also those markets for which capital investment from abroad is particularly important.

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Table 1

This Table reports the ratio of outside directors to the total number of directors on the Board and the ownership of shares by foreigners (as percentages).

	Mean	Standard deviation	Low quartile	Median	High quartile	Max
<i>Outside director/BOD</i> (N = 2817)	23.52	19.88	0.00	25.00	33.33	88.89
1999	10.47	15.79	0.00	0.00	25.00	85.71
2000	22.53	19.06	0.00	25.00	33.33	81.82
2001	24.69	19.45	0.00	25.00	33.33	83.33
2002	27.54	19.39	18.33	28.57	37.50	83.33
2003	31.23	19.04	25.00	33.33	40.00	88.89
<i>Shares owned by foreigners:</i> (N = 2890)	7.06	12.84	0.03	0.62	7.10	92.43
1999	5.82	10.89	0.02	0.76	6.03	75.53
2000	5.61	11.56	0.02	0.40	4.67	85.95
2001	6.37	12.62	0.02	0.50	6.04	82.94
2002	7.04	13.06	0.04	0.58	7.16	86.06
2003	9.26	15.10	0.07	1.00	12.08	92.43

Table 2

This table reports estimation results of unrestricted baseline models of foreign ownership. The table presents coefficients and p-values (in brackets) for tests of hypothesis H1 using pooled OLS (column 1) and Within Estimator (columns 2-4). The dependent variable is foreign ownership measured as foreigners' share of a company's equity. All other variables and statistical measures are defined in the Appendix. P-value is a cluster-correlation adjusted estimator for panel data analysis and heteroscedasticity-robust for OLS. Constants are not presented for brevity. All estimations include Year effect and Year-industry effect.

	Pooled OLS	Panel Analysis: Fixed Effects		
	(1)	(2)	(3)	(4)
Outside	0.097 [0.000]	0.042 [0.006]	0.040 [0.006]	0.042 [0.005]
CSHs	-0.031 [0.097]		-0.061 [0.012]	
CrossFirm	-0.024 [0.060]			-0.06 [0.002]
Book2Market	-0.816 [0.135]	-0.171 [0.152]	-0.152 [0.216]	-0.154 [0.151]
Dividend	0.017 [0.006]	0.002 [0.455]	0.003 [0.358]	0.003 [0.369]
Leverage	-0.044 [0.002]	-0.004 [0.625]	-0.006 [0.465]	-0.01 [0.217]
FinanDistr	-3.489 [0.000]	-0.248 [0.622]	-0.467 [0.354]	-0.342 [0.497]
ShareLiquid	0.187 [0.002]	0.027 [0.373]	0.021 [0.496]	0.023 [0.444]
CurrentRatio	-0.005 [0.009]	0.003 [0.092]	0.003 [0.095]	0.003 [0.108]
N	2475	2482	2475	2482
\bar{R}^2	0.09	0.067	0.071	0.08
RMSE	11.94	5.214	5.051	5.177

Table 3

This table presents coefficients and cluster-correlation adjusted p-values (in brackets) for tests of hypothesis H1a (chaebols vs. independent firms). The dependent variable is foreign ownership measured as foreigners' share of a company's equity. All other variables and statistical measures are defined in the Appendix. Constants are not presented for brevity. All estimations include Year effect and Year-industry effect.

	Pooled	Panel Analysis: Fixed Effects		
	OLS (1)	(2)	(3)	(4)
Outside	0.079 [0.000]	0.033 [0.047]	0.030 [0.051]	0.033 [0.042]
Chaebol_dum	2.164 [0.003]			
Chaebol* Outside	-0.069 [0.018]	0.023 [0.445]	0.027 [0.361]	0.023 [0.459]
Lnasset	3.99 [0.000]	3.706 [0.000]	3.965 [0.000]	3.36 [0.001]
CSHs	-0.012 [0.473]		-0.059 [0.011]	
CrossFirm	-0.073 [0.000]			-0.053 [0.006]
Book2Market	-0.967 [0.136]	-0.146 [0.202]	-0.126 [0.292]	-0.133 [0.208]
Dividend	0.012 [0.027]	0.002 [0.627]	0.002 [0.532]	0.002 [0.529]
Leverage	-0.054 [0.001]	0.000 [0.975]	-0.002 [0.819]	-0.005 [0.514]
FinanDistr	-0.932 [0.109]	-0.319 [0.510]	-0.547 [0.257]	-0.397 [0.416]
ShareLiquid	0.168 [0.001]	0.022 [0.448]	0.016 [0.594]	0.019 [0.513]
CurrentRatio	0.004 [0.027]	0.004 [0.080]	0.004 [0.081]	0.003 [0.095]
N	2475	2482	2475	2482
\bar{R}^2	0.265	0.083	0.091	0.093
RMSE	10.728	5.169	4.997	5.141

Table 4

This table presents coefficients and cluster-correlation adjusted p-values (in brackets) for tests of hypothesis H2 (home bias proposition) using Within Estimator. The dependent variable is foreign ownership measured as foreigners' share of a company's equity. All other variables and statistical measures are defined in the Appendix. All estimations include Year effect and Year-industry effect.

	(1)	(2)	(3)	(4)	(5)	(6)
Outside	0.042 [0.004]	0.041 [0.004]	0.039 [0.008]	0.038 [0.009]	0.028 [0.048]	0.030 [0.050]
CSHs		-0.045 [0.084]		-0.051 [0.056]		-0.035 [0.132]
CrossFirm		-0.044 [0.035]		-0.060 [0.005]		-0.036 [0.037]
Lnasset	3.657 [0.000]	3.627 [0.000]				
Lnquity			1.970 [0.000]	2.176 [0.000]		
Lnsales					0.453 [0.032]	0.392 [0.065]
Book2Market	-0.145 [0.207]	-0.119 [0.293]	-0.060 [0.635]	-0.013 [0.925]	-0.183 [0.157]	-0.168 [0.164]
Dividend	0.002 [0.631]	0.002 [0.479]	0.003 [0.378]	0.004 [0.231]	-0.001 [0.778]	-0.014 [0.846]
Leverage	0.000 [0.966]	-0.005 [0.458]	0.015 [0.283]	0.011 [0.414]	-0.007 [0.399]	-0.014 [0.098]
FinanDistr	-0.302 [0.530]	-0.567 [0.241]	0.341 [0.509]	0.110 [0.833]	0.184 [0.755]	0.016 [0.978]
ShareLiquid	0.022 [0.457]	0.014 [0.637]	0.012 [0.666]	0.000 [0.991]	0.028 [0.048]	0.019 [0.066]
CurrentRatio	0.004 [0.080]	0.003 [0.092]	0.004 [0.053]	0.004 [0.055]	0.003 [0.070]	0.003 [0.100]
N	2482	2475	2482	2475	2482	1674
\bar{R}^2	0.083	0.097	0.098	0.120	0.067	0.087
RMSE	5.170	4.981	5.128	4.917	5.215	4.424

Table 5

This table reports coefficients and cluster-correlation adjusted p-values (in brackets) for tests of hypotheses H1 and H2 after controlling for firm value. The dependent variable is foreign ownership measured as foreigners' share of a company's equity. All other variables and statistical measures are defined in the Appendix. Constants are not presented for brevity. All estimations include Year effect and Year-industry effect.

	(1)	(2)	(3)	(4)	(5)	(6)
Outside	0.043 [0.005]	0.043 [0.003]	0.041 [0.005]	0.042 [0.003]	0.043 [0.004]	0.043 [0.003]
CSHs			-0.062 [0.011]	-0.061 [0.009]		
CrossFirm					-0.062 [0.001]	-0.055 [0.004]
TobinQ	2.161 [0.000]	2.255 [0.000]	2.193 [0.000]	2.292 [0.000]	2.238 [0.000]	2.314 [0.001]
Lnasset		3.791 [0.000]		4.044 [0.000]		3.437 [0.001]
Book2Market	-0.132 [0.158]	-0.103 [0.235]	-0.112 [0.245]	-0.081 [0.373]	-0.112 [0.168]	-0.088 [0.264]
Dividend	0.003 [0.329]	0.002 [0.474]	0.004 [0.246]	0.003 [0.382]	0.004 [0.252]	0.003 [0.380]
Leverage	-0.021 [0.057]	-0.016 [0.108]	-0.023 [0.038]	-0.019 [0.061]	-0.027 [0.008]	-0.022 [0.028]
FinanDistr	-0.241 [0.638]	-0.296 [0.542]	-0.460 [0.370]	-0.524 [0.280]	-0.338 [0.509]	-0.377 [0.441]
ShareLiquid	0.029 [0.305]	0.024 [0.391]	0.023 [0.428]	0.017 [0.546]	0.025 [0.377]	0.020 [0.461]
CurrentRatio	0.004 [0.058]	0.004 [0.049]	0.004 [0.061]	0.004 [0.053]	0.004 [0.066]	0.004 [0.058]
N	2482	2482	2475	2475	2482	2482
\bar{R}^2	0.080	0.097	0.086	0.106	0.094	0.108
RMSE	5.177	5.130	5.012	4.956	5.138	5.099

Table 6

This table reports coefficients and cluster-correlation adjusted p-values (in brackets) for tests of hypotheses H1 and H2 after controlling for the firm value. The dependent variable is foreign ownership measured as foreigners' share of a company's equity. All other variables and statistical measures are defined in the Appendix. Constants are not presented for brevity. All estimations include Year effect and Year-industry effect.

	(1)	(2)	(3)	(4)	(5)	(6)
Outside	0.042 [0.019]	0.042 [0.018]	0.042 [0.017]	0.042 [0.016]	0.042 [0.018]	0.042 [0.018]
CSHs			-0.035 [0.273]	-0.038 [0.238]		
CrossFirm					-0.038 [0.038]	-0.037 [0.048]
Productivity	2.389 [0.000]	2.293 [0.001]	2.380 [0.000]	2.271 [0.001]	2.290 [0.001]	2.216 [0.001]
Lnasset		1.141 [0.356]		1.274 [0.308]		0.933 [0.455]
Book2Market	-0.113 [0.198]	-0.107 [0.224]	-0.099 [0.255]	-0.091 [0.299]	-0.106 [0.210]	-0.101 [0.233]
Dividend	0.005 [0.297]	0.004 [0.335]	0.005 [0.275]	0.005 [0.313]	0.005 [0.264]	0.005 [0.298]
Leverage	0.001 [0.858]	0.002 [0.682]	-0.001 [0.894]	0.001 [0.930]	-0.002 [0.737]	-0.001 [0.883]
FinanDistr	-0.955 [0.070]	-0.980 [0.059]	-1.014 [0.060]	-1.047 [0.047]	-0.988 [0.066]	-1.007 [0.057]
ShareLiquid	0.047 [0.037]	0.043 [0.052]	0.043 [0.052]	0.038 [0.079]	0.044 [0.051]	0.041 [0.064]
CurrentRatio	0.004 [0.097]	0.004 [0.097]	0.004 [0.130]	0.004 [0.134]	0.004 [0.114]	0.004 [0.115]
N	1520	1520	1516	1516	1520	1520
\bar{R}^2	0.083	0.085	0.085	0.087	0.089	0.090
RMSE	4.362	4.359	4.363	4.359	4.348	4.346

Table 7

This table reports panel instrument and System GMM estimation of foreign ownership. The table reports fixed effect panel instrument estimation (column 3-5) and system GMM estimation (columns 6-8), OLS (column 1) and fixed-effect (column 2) of foreign ownership. Estimated coefficients and p-values based on Huber-White sandwich estimation (brackets) are presented. Outside_excess is instrumented here using lagged inside board member in models (3)-(5). Excluded instrumental variables are lagged inside board member and board ownership for system GMM. Both Hansen and Arellano-Bond statistics are p-values. Variables are defined in the Appendix. All estimations include Year effect and Year-industry effect.

	<u>OLS</u>	<u>Fixed effect</u>	<u>Fixed effect instrument</u>			<u>System GMM</u>		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
L.Foreigners	0.088 [0.000]	0.022 [0.000]	n.a.	n.a.	n.a.	0.074 [0.000]	0.077 [0.000]	0.074 [0.000]
Outside_excess	0.037 [0.000]	0.038 [0.000]	0.065 [0.096]	0.072 [0.089]	0.081 [0.096]	0.032 [0.061]	0.029 [0.029]	0.032 [0.073]
CSHs	-0.001 [0.905]	-0.021 [0.222]	-0.039 [0.088]		-0.011 [0.704]		-0.101 [0.011]	
CrossFirm	-0.017 [0.029]	-0.052 [0.000]		-0.076 [0.000]	-0.072 [0.000]			-0.002 [0.958]
Book2Market	-0.527 [0.190]	-0.287 [0.386]	0.142 [0.794]	0.329 [0.581]	-0.254 [0.652]	-0.515 [0.957]	-0.114 [0.297]	-0.061 [0.953]
Dividend	0.004 [0.167]	0.003 [0.335]	0.002 [0.573]	0.003 [0.481]	0.002 [0.639]	0.002 [0.757]	0.008 [0.327]	0.002 [0.757]
Leverage	-0.007 [0.233]	-0.012 [0.165]	-0.039 [0.025]	-0.050 [0.012]	-0.043 [0.029]	0.051 [0.064]	0.013 [0.403]	0.051 [0.085]
FinanDistr	-1.454 [0.000]	-0.543 [0.305]	-0.211 [0.782]	-0.043 [0.958]	0.074 [0.921]	-6.384 [0.001]	-5.548 [0.006]	-6.399 [0.001]
ShareLiquid	0.057 [0.013]	0.026 [0.305]	0.108 [0.043]	0.110 [0.051]	0.082 [0.100]	0.232 [0.052]	0.179 [0.241]	0.231 [0.056]
CurrentRatio	-0.002 [0.129]	0.003 [0.121]	0.001 [0.737]	-0.001 [0.952]	-0.001 0.885]	-0.012 [0.004]	-0.013 [0.003]	-0.012 [0.004]
Hansen	n.a.	n.a.	n.a.	n.a.	n.a.	0.392	0.297	0.342
Arellano-Bond: m1	n.a.	n.a.	n.a.	n.a.	n.a.	0.005	0.005	0.005
Arellano-Bond: m2	n.a.	n.a.	n.a.	n.a.	n.a.	0.408	0.241	0.400
R ² (overall)	n.a.	n.a.	n.a.	n.a.	0.08	n.a.	n.a.	n.a.
N	2429	2429	1843	1943	1843	1480	1835	1480

Table 8

This table reports the estimation of foreign ownership by system estimation models. Figures in [] are Huber-White adjusted p-values. The simultaneous equation models are Seemingly Unrelated Equation (SUR) models (columns 1-2) and Structural Equation Model (SEM) (column 3-4). Column (3) allows residuals to be correlated, and column (4) imposes the restriction of independence. All simultaneous equation models include two equations: foreign ownership (i.e., *Foreigners*) on the upper panel and outside directors (*Outside_excess*) on the lower panel. All other variables are defined in the Appendix. Breusch-Pagan statistic indicates p-values for the null hypothesis of no correlation between residuals of the two simultaneous equations. Covariance refers to covariance of residuals between the two simultaneous equations. Constants are not reported for brevity.

	SUM		SEM	
	(1)	(2)	(3)	(4)
Equation 2: Foreigners				
Outside_excess		0.018 [0.000]	0.044 [0.005]	0.018 [0.000]
CrossFirm	-0.012 [0.416]	-0.028 [0.052]	-0.384 [0.010]	-0.165 [0.000]
CSHs	-0.023 [0.167]	-0.006 [0.731]	-0.343 [0.024]	-0.121 [0.006]
Book2Market	-0.495 [0.050]	-0.489 [0.053]	-0.603 [0.536]	-0.221 [0.537]
Dividend	0.022 [0.000]	0.022 [0.000]	0.037 [0.021]	0.008 [0.469]
Leverage	-0.016 [0.001]	-0.016 [0.001]	-0.058 [0.137]	-0.040 [0.069]
FinanDistr	-4.948 [0.000]	-4.968 [0.000]	-14.461 [0.003]	-8.569 [0.000]
ShareLiquid	0.169 [0.000]	0.169 [0.000]	0.437 [0.016]	0.184 [0.020]
CurrentRatio	-0.002 [0.404]	-0.002 [0.438]	0.011 [0.220]	0.010 [0.064]
Equation 3: Outside_excess				
Foreigners			0.006 [0.015]	0.020 [0.002]
Crossfirm	0.001 [0.000]	0.001 [0.000]	0.001 [0.000]	0.001 [0.223]
CSHs	-0.001 [0.000]	-0.001 [0.000]	-0.001 [0.000]	-0.001 [0.000]
L.Insider	0.001 [0.483]	0.001 [0.026]	0.005 [0.002]	0.013 [0.005]
Breusch-Pagan (P-value)	[0.00]	[0.68]	n.a.	n.a.
covariance	n.a.	n.a.	-5.253	n.a.

			[0.021]		
N	2355	2355	2355	2355	

Table 9

This table reports estimations of the effect of the appointment of outside directors on foreign ownership with a propensity score method. Treatment is defined as a binary equal to 1 if a firm appoints additional outside directors and zero otherwise (columns 1-2) and alternatively a binary equal to 1 if a firm appoints outside directors beyond the regulatory requirement and zero otherwise (columns 3-4). Propensity score is estimated by a probit model using the same regressors as the unrestricted model (Table 2, model 1). ATT refers to the causal effect of the appointment of outside directors on the treated firms only. In estimation, replacement is allowed. Kernel estimation is based on the Gaussian kernel. Five observations are used as a benchmark for the Nearest matching. Γ refers to log odds of differential assignment due to unobserved factors. Left and right figures in [,] refer to upper bound and lower bound significance levels respectively. Regressors other than the treatment variable are the same as in our unrestricted model.

	<u>Treatment: additional appointment of outside directors</u>		<u>Treatment: firms with excessively appointed outside directors</u>	
	Kernel (1)	Nearest (2)	Kernel (3)	Nearest (4)
ATT (Standard error)	0.0140 (0.0063)	0.0157 (0.0067)	0.0337 (0.0058)	0.0348 (0.0063)
N	2450	2450	2413	2413
Total number of common support (Treated group number)	2432 (682)	2432 (682)	2367 (1888)	2367 (1888)
Rosenbaum bounds for the difference in response variable:[Upper, Lower bound]				
$\Gamma = 1$	[1,1]	[1,1]	[.999,.999]	[.392,.392]
1.1	[1,.999]	[1,1]	[1,.945]	[.934,.024]
1.2	[1,.999]	[1,1]	[1,.483]	[.999,.00]
1.3	[1,.998]	[1,1]	[1,.061]	[.999,.00]
1.4	[1,.954]	[1,.999]	[1,.000]	[1,.000]
1.5	[1,.821]	[1,.999]	[1,.000]	[1,0]

APPENDIX

Table A1

This table reports variables definitions and data sources.

Variable	Definition
<i>Dependent variables</i>	
Foreign ownership	foreigners' share of a company's equity
<i>Independent variables</i>	
Outside	ratio of outside board directors to total directors
CSHs	controlling shareholders' ownership calculated as the number of CSHs' shares divided by the total number of shares
CrossFirm	cross-firm shareholding calculated as the number of shares owned by other business corporations divided by the total number of shares issued
Book2Market	book-to-market ratio calculated as the book value per share over the year-end market share price
Dividend	dividend payout ratio calculated as cash dividend divided by net profit
Leverage	long-term financial distress measured as total liabilities divided by total assets
FinanDistr	short-term financial distress measured by a binary variable equal to one if a firm had losses for two consecutive years and zero otherwise
ShareLiquid	cash-convertability of investment measured as the total value of shares traded over a year divided by the number of shares outstanding
CurrentRatio	firm stability measured by the ratio of current assets to current liabilities
Lnasset	natural logarithm of assets (in thousands of won)
Lnequity	natural logarithm of market value of equity (in thousands of won)
Lnsales	natural logarithm of market value of sales (in thousands of won)
TobinQ	firm value calculated by adding market value of equity and book value of debt and dividing by book value of assets
Productivity	firm value based on estimation of productivity function following Levinsohn and Petrin (2003) and Olley and Pakes (1995)
L.Foreigners	one period lag foreign ownership
Outside_excess	outside directors appointed beyond the required 25 percent of the Board of Directors
Od_minus	binary variable given the value unity if the number of outside directors declined and zero otherwise
<i>Statistical measures</i>	
RMSE	root mean squared error