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## **Foreign equity investment and firm performance**

Jongmoo Jay Choi, Temple University\*  
Sehyun Yoo, San Diego State University

### **Abstract:**

There is a considerable debate on the impact of foreign investment on host economies. This paper examines the relation between foreign equity ownership and firm performance by using a panel sample of Korean firms. Empirical results show that foreign investors positively affect firm performance by active monitoring, complementing domestic institutional investors. It was after the government completely opened the stock market and changed regulations to improve management transparency following the Asian financial crisis that such positive relation was realized. Foreign board membership is also positively related to firm performance, countering agency costs of indigenous institutions such as family controls or group affiliations.

JEL codes: G34, G38, L20

Keywords: foreign investments, foreign equity ownership, foreign board membership, family controls, international corporate governance

\*(Correspondence) Laura H. Carnell Professor of Finance and International Business, Fox School of Business, Temple University, Philadelphia, PA 19122  
(Phone: 215-204-5084; Email: jjchoi@temple.edu)

*For presentation at Korean Institute of International Economic Policy, July 2005*

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### **1. Introduction**

(?needs to be rewritten?) Foreign direct investment is viewed as a manifestation of market imperfections and a vehicle to capitalize on firm-specific advantages and increase the return on investment of firms going international (e.g., Grossman and Hart, 1986). In step with a rapid increase in international portfolio investments in the last decades, the monitoring role of foreign equity investors in emerging markets has also been recognized (e.g., Khanna and Palepu, 1999; Baek, Kang, and Park, 2004). It was the recent financial crisis in Asia that particularly motivated researchers to examine the causes of the crisis from the corporate governance point of view and study corporate governance practices in emerging markets (e.g., Mitton, 2002; Lemmon and Lins, 2003)<sup>1</sup>. This study empirically examines the effect of foreign equity ownership on firm performance for an emerging market economy, Korea, where foreign stockholding limits were completely lifted in 1998 following the Asian financial crisis.

When insiders own controlling stocks, they have incentives to pursue their personal benefits at the expense of outside minority shareholders. Such agency problems can be curtailed by outside blockholders, who have incentives to monitor managerial performance, and thus take actions to increase firm value (Shleifer and Vishny, 1986). The monitoring

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<sup>1</sup> Corporate governance may be defined as the effectiveness of mechanisms that minimize agency conflicts involving managers, with particular emphasis on the legal mechanisms that prevent the expropriation of minority shareholders (Shleifer and Vishny, 1997), or the system of laws, rules, and factors that control operations at a company (Gillan and Starks, 2003).

function performed by outside shareholders is probably more important in emerging markets than in more developed markets because the controlling shareholders are typically insiders, and frequently they intervene in management decision-making. However, monitoring by domestic institutional investors is generally inefficient in most emerging markets because of the underdevelopment of local capital markets and institutions, lack of an adequate regulatory system, and political constraints. Dahlquist and Robertsson (2001) propose in their study of Swedish firms that the characteristics of foreign investors resemble those of institutional investors, claiming that the observed foreign investor bias is in fact the institutional investor bias. This implies that foreign investors can complement the inadequate or inefficient monitoring of domestic institutions. Thus, local authorities can effectively import the monitoring capability of institutional investors by opening local stock markets to foreign investors. Khanna and Palepu (1999) suggest foreign investors perform a valuable monitoring function as emerging markets integrate with the global economy. This leads to the main empirical hypothesis of this study that firm performance increases with foreign equity ownership. The positive effect on firm performance of management oversight can be further sustained by the direct board participation of foreign investors as evidenced in the Nordic sample by Oxelheim and Randøy (2003).

Firm-level data from Korea are used to empirically test the effect of foreign equity ownership on firm performance for several reasons. First, we can test whether the presence or absence of the holding limit causes any significant difference in the hypothesized relation between foreign equity ownership and firm performance. The Korean stock market was opened in 1992 with a foreign equity holding limit, and the holding limit was

completely lifted in 1998. Figure 1 shows that the market value of outstanding shares held by foreign investors relative to the total market almost quadrupled from 10.2% in 1994 to 40.1% in 2003.<sup>2</sup>

[Insert Figure 1 around here.]

Second, We examine the sample period that provides an opportunity to examine how the relation between foreign equity ownership and firm performance changed before, during and after the Asian financial crisis. The Asian financial crisis devastated the Korean economy in 1997, which resulted in a series of regulatory changes in many areas such as accounting practices, foreign exchange control and corporate governance. Baek, Kang and Park (2004) suggest that firm-level differences in corporate governance measures affect a change in firm value during an economic crisis by using a sample of Korean firms during the Asian financial crisis.

[Insert Table 1 around here.]

The empirical results highlight that foreign equity ownership has significant and positive effects on firm performance. They imply that the monitoring function of foreign investors enhances firm performance and complements the relatively weak monitoring by domestic institutions. It was only after the authorities implemented governance-enhancing institutional and regulatory changes following the Asian financial crisis that such value-enhancing effects became statistically and economically significant. The presence of foreign board members also exerts a positive effect on firm performance. These results

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<sup>2</sup> The ratio of foreign equity ownership relative to the total market capitalization exceeded 50 percent in the first quarter of 2004.

suggest that firm performance is positively related to a likely improvement of management transparency by market opening and foreign board membership and more credible information values. Information value embedded in international listing that requires more information disclosure stands out during the crisis period.

On the other hand, indigenous factors such as family ownership and chaebol-affiliation show insignificant results.<sup>3</sup> A further analysis of chaebol affiliation by sub-period suggests that chaebol affiliation may be positively related to firm performance once agency costs inherent in chaebols are moderated by external monitoring of large outside blockholders and governance-enhancing regulatory changes.

Characteristically, empirical results indicate that foreign investors prefer larger firms with sound capital structure, which is consistent with previous studies (Dahlquist and Robertsson, 2001; Lin and Shiu, 2003). They also invest more in less family-controlled, less risky, more familiar, and more transparent firms.

The empirical results have several policy implications. First, the authorities can improve firm performance by attracting more foreign investors to local equity markets because the monitoring and market disciplinary actions of foreign investors complement those of domestic institutional investors. Obviously, any market opening involves more than corporate governance. There may be strong resistance from local shareholders and the

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<sup>3</sup> The Korea Fair Trade Commission defines a chaebol as a group of companies of which more than 30% of shares are owned by the group's controlling shareholders and its affiliated companies. Although most chaebol firms are family-controlled, family firms are not the same as chaebol firms - family ownership shows the effect of ownership, whereas chaebol-affiliation shows the effect of group membership.

corporate sector. In the case of Korea it took an economic shock as grave as the Asian financial crisis for the authorities to completely open the stock market to foreign investors. Second, the authorities can orchestrate different corporate governance mechanisms to alleviate agency costs in business groups and to enable affiliated firms to capitalize on the benefits of group affiliation. Foreign equity ownership as an external corporate governance mechanism can play an important role in such policy measures.

The rest of this study is organized as follows. Section 2 discusses how firm performance is related to foreign equity ownership. The empirical methods and data are described in Section 3, followed by empirical results in Section 4. Section 5 closes with the summary and conclusions.

## **2. Foreign Equity Ownership and Firm Performance: Hypotheses**

Given the separation of corporate ownership and control, owners need to monitor managerial performance to enhance firm value. A typical remedy suggested in the literature is the alignment of interests of managers and owners by turning managers into shareholders. However, such a solution can introduce another type of agency problem between insiders and outsiders in emerging markets where many firms are family-owned or controlled by a group of large shareholders, and voting rights frequently exceed cash-flow rights by crossholdings and pyramid ownership structure (Claessens, Djankov, and Lang, 2000; Lemmon and Lins, 2003; Lins, 2003). Controlling insiders have incentives to pursue their personal benefits at the expense of minority shareholders, resulting in suboptimal firm value. Thus, the effective monitoring of (insider) manager-owners by outsider shareholders

becomes an important issue in emerging markets. Shleifer and Vishny (1997) argue that outside blockholders can mitigate managerial opportunism or value expropriation by insiders. Mitton (2002) and Lins (2003), respectively, show that firm performance is positively related to outside ownership in emerging markets.

Who assumes such monitoring and market disciplinary functions in emerging markets? Khanna and Palepu (1999) argue that indigenous monitoring is inadequate in emerging markets because of the absence of specialized intermediaries providing monitoring services, the dominance of large insider shareholdings, the absence of minority shareholder rights, and the importance of political connections. Dahlquist and Robertsson (2001) suggest that the determinants of foreign equity ownership are similar to those of institutional ownership in their study of Swedish firms, implying that both investor groups can assume similar corporate governance roles. The monitoring by foreign investors can complement monitoring by other local investors such as domestic institutional investors, who may be prevented from conducting a full monitoring function because of regulatory or political constraints.<sup>4</sup> This leads to the main empirical hypothesis that firm performance is positively related to foreign equity ownership: foreign equity ownership enhances firm performance.

Since the foreign stockholding limit was capped at 20 percent point before the outbreak of the financial crisis in December 1997, we can presume the monitoring

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<sup>4</sup> For example, Korean financial institutions were not permitted to affect corporate voting decisions: shadow voting. Mandatory shadow voting was abolished after the Asian financial crisis as the Korean government aimed to improve corporate governance practices.

capability of foreign investors was accordingly constrained. To attract more foreign capital as a partial solution for the liquidity crunch caused by the Asian financial crisis, the government immediately lifted the foreign stockholding limit to 55 percent in December 1997, and then completely eliminated it in May 1998. This subsequently resulted in a dramatic hike in capital inflow. At the same time, foreign investors became unrestricted in their shareholder activism and market disciplinary actions, hence monitoring. A series of regulatory changes were also instituted to improve corporate governance and management transparency. For example, listed firms were required to maintain a ratio of outside directors to total board members of at least 25 percent from the 1999 financial year onwards. We hypothesize that the post-Asian financial crisis institutional and regulatory changes enhance the positive effect of foreign equity ownership on firm performance.

Furthermore, foreign investors can perform monitoring and advisory functions from inside a firm by holding board membership. In addition to the complete stock market opening, the regulatory changes in board structure could have made local firms more inclined toward foreign board members. Local firms can have a channel to modernize board structure by having foreign board members, or at least these firms can signal to the financial markets that they are willing to expose themselves to more efficient corporate governance mechanisms (Oxelheim and Randøy, 2003). We hypothesize that firm performance increases with foreign board membership.

External corporate governance mechanisms include the market for corporate control and institutional investors. Outside institutional blockholders have incentives to monitor management performance and enhance firm value (e.g., Shleifer and Vishny, 1986, 1997;



Mitton, 2002; Lins, 2003; Baek, Kang and Park, 2004). In Korea, the main outside institutional blockholders are banks and foreign investors. A proxy for outside domestic financial institutional ownership is referred to as bank holdings. We exclude insurance and securities companies from domestic institutional ownership because these companies are usually under the control of chaebols so that their monitoring roles may be substantially impaired.<sup>5</sup> Public sector holdings are also excluded because they may be motivated by non-economic factors. We hypothesize that firm performance increases with bank holdings.

A large number of Korean firms are family-controlled. Family firms may have a comparative advantage because of a decrease in managerial agency costs (Demsetz and Lehn, 1985). Anderson and Reeb (2003) show that family firms performed better than non-family firms in the U.S. On the other hand, family ownership causes insider-induced agency costs as a result of suboptimal investment decisions, excessive compensation and continued employment of incompetent owner-managers (e.g., Fama and Jensen, 1985; Shleifer and Vishny, 1997). Several studies of the Asian financial crisis strongly suggest the likelihood of expropriation of atomistic shareholders by controlling shareholders who belong to founding families (e.g., Claessens, Djankov, and Lang, 2000). We hypothesize

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<sup>5</sup> By law, securities companies are not allowed to hold the parent company's stock generally, and insurance companies are restrained from exercising voting rights on affiliated companies of the same business group. Thus, family holdings do not include affiliated financial companies' holdings. Cho and Park (2002) show that institutional investors voted for management in 305 out of 323 cases (94.4%) between March 2001 and February 2002. They suggest most domestic financial institutions and institutional investors (except banks and pension funds) are passive toward corporate governance because they are under the control of chaebols.

that family ownership moderates the positive monitoring role of foreign investors in Korea: family ownership impedes the governance role of foreign investors.

The effect of ownership in the firm fundamentally depends on the institutional characteristics and structure of each market. A large number of firms in Korea are controlled by chaebols, which involves family control as well as keiretsu-like group behavior. Firms affiliated with business groups can capitalize on internal markets for resources and risk diversification among member firms (Shin and Park, 1999; Khanna and Palepu, 2000). Such value-adding benefits from chaebol affiliation can be negated by value-destroying costs, dubbed *tunneling*. For example, there could be the transfer of resources from more efficient to less efficient member firms, or from firms with higher divergence between voting rights and cash flow rights to ones with lower divergence, and through joint projects within the group (e.g., Bae, Kang and Kim, 2002; Joh, 2003; Lins, 2003; Baek, Kang and Park, 2004). Given this potential conflict in the effect of business groups, whether a firm belongs to a business group or not could make foreign investors play a differing role. Thus, the interaction of foreign equity ownership with chaebol affiliation can be positive or negative depending on the relative validity of the value-adding or tunneling hypotheses.

To sum up, this study focuses on the relation between foreign equity ownership and the firm performance and valuation in Korea, and whether such relation is sustainable in the presence of other intervening variables such as domestic institutions, chaebols, and institutional and regulatory changes stemming from the Asian financial crisis. A positive association between foreign ownership and firm performance is generally expected; this

relation can be enhanced or moderated by other generic and Korea-specific economic and institutional characteristics.

### **3. Empirical Methods and Data**

We hypothesize in the previous section ownership affects firm performance. On the other hand, it may be that firm performance can affect ownership: i.e., ownership structure can be endogenously determined (e.g., Demsetz and Lehn, 1985). First, single equation estimations are used with lagged independent variables to control for endogeneity as is customarily used in the literature (e.g., Kang and Shivadasani, 1995). Firm performance is regressed on one-year lagged ownership variables. Since a firm whose financial year ends in December publishes its annual report in the following spring, the use of one-year lagged ownership variables reflects the ownership structure at the beginning of the year. As a robustness check, Fama-MacBeth estimates are separately calculated by averaging the estimates of individual yearly regressions. Second, a full information maximum likelihood (FIML) estimation of simultaneous equations is used to control for the joint-determination of ownership structure and firm performance: endogenous variables are firm performance and foreign equity ownership. The firm performance equation is identically specified as that of the single equation analysis for consistency. The foreign equity ownership equation is replicated as closely as possible based on previous studies (Dahlquist and Robertsson,

2001; Lin and Shiu, 2003).<sup>6</sup> The single-equation and FIML estimation models of the relation between firm performance and foreign equity ownership are specified as follows:

Single-equation analysis:

$$Performance_t = Foreign_{t-1} + Own_{t-1} + Performance_{t-1} + Control_t + Intercept_t \quad (1)$$

Simultaneous equations analysis with FIML estimation:

$$\begin{aligned} Performance_t &= Foreign_t + Own_{t-1} + Performance_{t-1} + Control_t + Intercept_t \\ Foreign_t &= Performance_t + Own_{t-1} + Foreign_{t-1} + Control_t + Intercept_t \end{aligned} \quad (2)$$

where *Performance* = Tobin's q

*Foreign* = foreign equity ownership

*Own* = {banks and family ownership}

*Control* ∈ {chaebol affiliation dummy variable, depository receipt dummy variable,

bank loan ratio, exports to sales, net foreign assets to total assets, R&D expenditures

to sales, current ratio, debt ratio, dividend yield, log of sales, beta, return on assets,

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<sup>6</sup> Agrawal and Knoeber (1996), and Mak and Li (2001), e.g., apply the weighted two-stage least square method to a system of equations in which ownership variables and other control mechanisms as endogenous variables are regressed on firm characteristics.

As an alternative specification, panel data analysis could be used (e.g., Himmelberg, Hubbard, and Palia, 1999). An unreported preliminary analysis favors the fixed effect model against the random effect model. Zhou (2001) criticizes the use of firm fixed effect variables by introducing firm-specific dummy variables because relying on within-variation to explain ownership structure's effect on firm performance virtually eliminates the cross-sectional variation, leading to insignificant estimation results. Since the empirical framework is cross-sectional in this study, it may be appropriate to follow Zhou's suggestion that the fixed effect model should be used carefully to account for cross-sectional variations.

log of trading volume, positive earnings dummy variable, year and industry dummy variables}

A common measure of firm valuation in empirical corporate finance is Tobin's  $q$ . Following Khanna and Palepu (2000), and Demsetz and Villalonga (2001), Tobin's  $q$  is defined as the sum of the market value of common stock and book value of preferred stock and total liabilities divided by the book value of total assets.<sup>7</sup>

The pattern of ownership is disaggregated by shareholder type: foreign investors, banks, and family owners. The foreign investor holdings are the percentage ownership held by registered foreign investors. Several studies examine the nonlinearity of ownership and firm performance (e.g., Morck, Shleifer and Vishny, 1988; McConnell and Servaes, 1990; Cho, 1998; Joh, 2003; Chen, Guo and Mande, 2003). To test for the nonlinearity of foreign investor holdings and firm performance, the square term of foreign investor holdings and its interaction terms with bank holdings, family holdings, chaebol affiliation and depository receipt are included.

Bank holdings include ownership stakes held by commercial banks and financial institutions. Family ownership is measured by the percentage ownership held by the largest shareholder family and associated shareholders who are under the control of the largest shareholder family.

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<sup>7</sup> Some alternative definitions are as follows: (1) the market value of a firm divided by the replacement costs of its assets (Lindenberg and Ross, 1981), (2) (the market value of equity + the book value of preferred stock + the book value of total liabilities) / the replacement value of assets (Woidtke, 2002).

The foreign director dummy variable indicates the presence (one) or absence (zero) of registered foreign citizens on the board.

Control variables include not only typical firm-specific variables measuring operational and financial characteristics of the firm but also other variables such as chaebol-affiliation, depository receipts, year and industry dummy variables. The export to sales ratio is included to measure the firm's international operations as well as the importance of exports in the Korean economy. The ratio of exports to sales is also used to control for familiarity to foreign investors in the foreign equity equation (Darquist and Robertsson, 2001; Lin and Shiu, 2003). The ratio of net foreign assets (converted into the Korean won) to total assets is used as a proxy for multinationality.<sup>8</sup> The ratio of research and development expenditures to sales is used as a proxy for intangible assets, which measures the firm's internalized oligopolistic advantage and is expected to increase firm value (e.g., Himmelberg, Hubbard and Palia, 1999; Demsetz and Villalonga, 2001; Woitke, 2002). Firm size is measured by the natural log of sales in Korean won. To the extent that larger firms tend to be more diversified with potentially bigger agency and bureaucratic costs, the effect of firm size can be negative. Profitability is measured by return on assets, the ratio of earnings before interest, tax, depreciation and amortization (EBITDA) to total assets.

The debt ratio, total debts to total assets, is a measure of a firm's financial risk, but

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<sup>8</sup> Alternative measures of multinationality could be (1) the number of countries in which a firm has subsidiaries or affiliated firms, (2) the number of countries where the firm has operations, and (3) the proportion of foreign employees or managers.

may also indicate the degree of monitoring performed by debt holders. The effect of the debt ratio on firm value is ambiguous, depending on whether the cost of financial leverage outweighs the benefit, and also on whether the debt ratio indicates the monitoring role of debt holders. In the latter interpretation, the effect can be positive. The ratio of bank loans to total debts is used to measure the strength of a firm's ties to banks since Korean firms have traditionally depended heavily on bank financing (e.g., Baek, Kang and Park, 2004). The effect of strong ties to banks is expected to be positive on firm performance since close relations between banks and client firms could be beneficial to the latter: (main) banks provide not only short-term and long-term financing, but also give client firms managerial advice if necessary. The current ratio is included to control for the financial capacity to meet short-term financial requirements. It is expected to have a positive relation to firm performance. The dividend yield is included as a proxy for investment opportunities. The dividend yield is expected to be negatively related to firm value.

The beta is estimated from the market model by using a one year sample of daily stock returns for each firm-year observation. The estimation period is one year because a multiple year sample would cause the overlapping of the sample estimation periods.<sup>9</sup> The log of annual trading volume is calculated to control for the liquidity in the stock market.

The chaebol affiliation dummy variable indicates whether a firm belongs to one of the top 30 chaebols. The use of the top 30 chaebols is a standard practice in Korea. The

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<sup>9</sup> Baek, Kang and Park (2004) also use one-year daily stock returns when they estimate the beta coefficient of the market model. They study the degree of reduction in share values of Korean firms during the 1997-1998 financial crisis.

chaebol affiliation of each firm is based on the Korea Fair Trade Commission's classification. The list of the top 30 chaebols is subject to change each year, which makes the chaebol affiliation of sample firms vary every year. For a firm to issue depository receipts, it should meet the disclosure requirements for international listing. The effect of information transparency is measured by the depository receipt dummy variable (e.g., Mitton, 2002; Baek, Kang and Park, 2004). A dummy variable indicating whether the previous year's earnings were positive is included as a proxy for investment decisions of institutional investors (e.g., Woitke, 2002). Dummy variables are also included for year and industry. Four industry dummy variables, by adopting the local market convention, are used as a proxy for unobserved industry effects: manufacturing, services, construction and transportation, and utility and telecommunication. Utility and telecommunication are listed separately because of their different regulatory environments. Table 2 provides a list of all variables used in the empirical work.

[Insert Table 2 around here.]

All ownership and firm-specific accounting data are obtained from the Listed Company Database of the Korean Listed Companies Association (KLCA). The daily stock price and market index data are obtained from the Korea Stock Exchange (KSE). The list of top 30 chaebols is obtained from The Korea Fair Trade Commission (KFTC).

The sample is composed of 443 firms from 1993 to 2002. The sample includes all KSE-listed non-financial firms for which necessary ownership and firm-specific variables are available. The frequency of all variables is annual, and the values are measured as of the end of December for each year. The use of lagged ownership variables reduces the



available sample size to 3,544 observations covering eight years from 1994 to 2002. The sample period should reflect the influences of foreign investors on Korean companies through gradual market openings and the Asian financial crisis. The full sample is divided into three subsamples by period: the pre-crisis (1994 - 1996), the crisis (1997 - 1998) and the post-crisis (1999 - 2002) samples.<sup>10</sup>

Table 3 presents the Pearson correlation coefficients of the explanatory variables. The condition number suggested by Belsley, Kuh, and Welsch (1980) indicates no serious multicollinearity problems among explanatory variables. Foreign equity ownership is positively correlated to size variables such as firm size, and chaebol affiliation, to some extent.<sup>11</sup> It is also negatively correlated to the debt ratio. These coefficients are consistent with previous findings that foreign investors generally prefer large and financially sound companies (e.g., Darlquist and Robertsson, 2001; Lin and Shiu, 2003). Bank holdings are positively correlated with foreign investor holdings, suggesting that their monitoring effects

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<sup>10</sup> The Korean stock market was opened to foreign investors in 1992. The ownership data for 1992 were incomplete, i.e. much smaller than the rest of sample years. Consequently, we exclude 1992 observations from the final sample. The sample includes only companies that were listed continuously over the sample period. Delisted companies as a result of financial distress or mergers and acquisitions are not included. Also, companies that went public during the sample period are excluded. Such survivorship bias is built into the sample in exchange for allowing the sample to reflect variations for the full sample period. The average number of listed firms on the KSE from 1993 to 2002 is 724 (?check?). Financial firms are excluded because they are subject to different regulatory requirements and have undergone severe restructuring since the Asian financial crisis. The financial sector reform is the subject of a separate study.

<sup>11</sup> The average size of the total assets for the chaebol sample is 935.36 billion won, while for the non-chaebol sample the mean value is 143.97 billion won.

can be complementary. On the other hand, the negative correlation coefficient with family holdings indicates that foreign investors avoid family-controlled firms, presumably because of the negative effects of agency costs on firm value, *ceteris paribus*.

[Insert Table 3 around here.]

## 4. Empirical Results

The estimation results of the empirical analysis are fourfold. There are three sections on firm performance and ownership, and one section on foreign board membership. By using the full sample, this section first shows the results of the single equation analysis with lagged foreign investor holdings, and then presents the results of the simultaneous equations analysis. Both analyses are further examined by dividing the full sample into three subsamples. Finally, the effect of foreign board membership on firm performance is analyzed with the post-crisis sample only due to data availability.

### 4.1 Single Equation Analysis

Table 4 provides the full-sample results of the single equation analysis. The empirical results strongly support the positive relation between firm performance and foreign equity ownership. This is consistent with previous studies that focus on a smaller sample period than this study (e.g., Baek, Kang and Park, 2004). Since bank holdings as a proxy for domestic institutional monitoring turns positive but largely insignificant, the monitoring role performed by foreign investors appears more important for the local market, and generally for emerging market economies where domestic institutions are

inefficient in monitoring due to institutional and regulatory restrictions, and political influences (Khanna and Palepu, 1999). In other words, foreign investors can complement domestic institutional investors, enhance the monitoring role of non-management outside blockholders, and consequently improve firm performance. The square term of foreign investor holdings in equation (A3) indicates nonlinearity between Tobin's  $q$  and foreign investor holdings, and its inclusion does not qualitatively change the results of the estimation without the square term in equation (A1).

Although family ownership expectedly reduces firm value because of the likelihood that controlling insiders exploit minority shareholders, Table 4 shows that family holdings are negative, but both economically and statistically insignificant. This is inconsistent with Anderson and Reeb (2003) who demonstrate that family ownership in public firms reduces agency problems as long as outside monitoring decreases decision-making inefficiency caused by family manipulations. The insignificant result is consistent with some of the previous studies suggesting that insider ownership is endogenously determined, and has empirically insignificant effects on firm performance (e.g., Cho, 1988). The interaction term of foreign investor holdings with family holdings is also insignificant in equation (A4).

[Insert Table 4 around here.]

The chaebol dummy variable is positive and statistically insignificant except in equation (A3), suggesting neither the value-adding nor tunneling hypothesis is dominant. The depository receipt dummy variable is also positive and insignificant, questioning the expected positive relation between firm performance and informational transparency (e.g.,

Mitton, 2002). These results are further examined in the following section on sub-period analyses.

The debt ratio is positive and significant at the one percent level across different specifications, which indicates that debt holders as a group exert positive effects on firm performance through monitoring. Equation (A2), however, shows that bank loan ratio is negative and significant at the one percent level. It implies that close and relationship-based ties with banks fail to support client firms over the sample period in which the financial sector, especially banks, were severely struck by the Asian financial crisis. For example, Baek, Kang and Park (2004) argue that an economic shock can limit the lending capacity of a bank, which in turn affects client firms adversely. Banks laden with their own financial difficulties are bound to be less supportive of client firms.

The contribution from intangible assets is evidenced by the positive and significant R&D expenditures to sales. However, the size of a firm is negatively and significantly related to firm performance. Agency problems increasing with firm size may contribute to this negative size effect (e.g., Joh, 2003).

Accounting profitability and systematic risk of firms are positive and negative, respectively, and both variables are generally insignificant except equations (A3) and (A4) in which nonlinearity and interaction terms are examined. On the other hand, dividend yield is negative and significant at the one percent level, suggesting the lack of growth opportunities is negatively related to firm value as expected.

Fama-MacBeth regression results shown in equation (A5), however, question the validity of some estimation results from the full sample. First, foreign equity ownership

turns statistically insignificant. This indicates there was a large variation in coefficient estimates year by year. It may be caused by changes in the stockholding limits imposed on foreign investors. Table 1 shows the holding limit was capped at 20 percent until 1996, which corresponds to the pre-crisis sample period. Some *hot* issues were even traded at a premium (to the market price of the same stocks) in the OTC market once the foreign holding limits were reached. Although the authorities lifted the foreign holding limit to 55 percent in 1997 to induce more hard currencies into the local economy, and eventually completely eliminated the limit in 1998, the percentage holding of shares by foreign investors was not restored to the pre-crisis level until after 1998: 11.5 percent in 1996, 9.1 percent in 1997, 10.4 percent in 1998 and 12.4 percent in 1999. These imply that foreign investors tend to focus on short-term investment return as opposed to long-term gains from improved corporate governance. The post-crisis period shows foreign equity ownership continues to grow, suggesting the latter objective of foreign equity investors becomes stronger. Second, the depository receipt dummy variable also indicates a substantial variation between yearly estimates. We further examine implications of these variations in the following section on sub-period analyses.

## 4.2 Simultaneous Equations Analysis

Estimation results of two systems of simultaneous equations are presented in Table 5. The first system includes only foreign investor holdings, while other ownership variables are added in the second system. Table 5 shows that Tobin's  $q$  affects foreign investor holdings positively and significantly. The foreign equity ownership equation

additionally exhibits the characteristic determinants of foreign investor holdings. First, foreign investors prefer a larger firm with sound capital structure: positive log of sales and negative debt ratio. These results are consistent with previous studies (Dahlquist and Robertsson, 2001; Lin and Shiu, 2003). Second, foreign investors decrease their equity holdings in more-family-controlled firms. Family holdings are -0.015 (p-value is 0.12). Foreign investors appear inclined to more familiar firms, measured by exports to sales, while the DR dummy variable significantly indicates that information revealed through DR issuance positively affects foreign equity ownership. Foreign investors are averse to risky firms (indicated by the negative and significant beta at the ten percent level), and prefer firms with positive earnings in the previous year. The latter is consistent with a typical selection criterion of target firms by institutional investors (Woidtke, 2002). Interestingly, R&D expenditures to sales are negative and significant at the five percent level suggesting that foreign investors favor less R&D-intensive firms. These results may indicate that foreign investors are skeptical of the effectiveness of R&D expenditures by local firms (possibly due to their perceptions of the efficacy of the intellectual property protection regime in Korea) or that they tend not to *support* R&D-intensive and growth-oriented local competitors.

[Insert Table 5 around here.]

The firm performance equation confirms the main result of the previous section that foreign equity ownership positively affects firm performance. Combined with the results of the foreign equity equation that Tobin's q affects foreign investor holdings, these results

reaffirm the joint-determination of ownership and performance in general, and show that of foreign equity ownership and Tobin's  $q$  in particular.

Other independent variables of the firm performance equation remain qualitatively unchanged from the single equation analyses in Table 4 except for exports to sales, which has the same sign but loses statistical significance.

### 4.3 Sub-period Analysis

Table 6 provides the estimation results by sub-period. Panel A shows the estimation results of the single equation analyses, and the following two panels present the corresponding results of the simultaneous equations analyses. First of all, the positive effect of foreign equity ownership on firm performance is only statistically significant for the post-crisis period in both single equation analyses and simultaneous equation analyses. On the other hand, Tobin's  $q$  positively and significantly affects foreign equity ownership for the pre-crisis period only. Better performing firms attract foreign equity investment, and the presence of foreign equity ownership does not improve firm performance: this implies that foreign investors did not enhance firm performance by monitoring or market disciplinary actions before the crisis.

The positive effect of foreign equity ownership in the post-crisis period, however, indicates that foreign investors did improve firm performance. It is a specific demonstration of a general proposition that outside blockholders improve firm value (Shleifer and Vishny, 1997). At the same time, Tobin's  $q$  in the foreign equity ownership equation is statistically insignificant for the post-crisis period. This weakly supports the

joint determination of foreign equity ownership and firm performance as Tobin's  $q$  is positive and significant at the five percent level only for the pre-crisis period. There are several possible explanations for this result. First, in the crisis and post-crisis periods many foreign creditors became *reluctant* equity investors as equity for debt swaps have been a major tool in corporate financial restructurings in Korea. In this case, Tobin's  $q$  would not necessarily be a significant predictor of foreign equity ownership. Additionally, once the Korean stock market was fully open to foreign investors from 1998 onwards, foreign fund managers following a market index approach were obliged to purchase all stocks in the KOSPI index. This represents another situation in which firm performance might not be a significant factor in the determination of foreign equity ownership: the latter explanation is more plausible for equal-weighted stock indices.

These results imply one necessary condition for foreign equity ownership to play an effective governance role: complete (or semi-complete) market opening. Given individual holding limits imposed at the individual investor level, foreign investors were technically prohibited from amassing sufficient stocks to naturally trigger incentives to monitor local firms. Poor governance practices were widely viewed as one of contributing factors to the Asian financial crisis (Choi, 2000). The Asian financial crisis forced the local authorities to open the stock market completely to induce more foreign currencies into the faltering economy. The forced market opening enabled the local government to achieve two economic objectives: inflow of foreign capital and improvement of corporate governance. Without an external shock as great as the Asian financial crisis, the Korean stock market would likely have been opened gradually or at a much slower pace. In this case, the



monitoring role exhibited by foreign investors might have not been as visible as the post-crisis sample shows.

Other ownership variables, banks and family, remain insignificant for both analyses. Importantly, domestic institutional monitoring remains ineffective, which is consistent with the proposition of Khanna and Palepu (1999) that domestic institutional monitoring is poor in emerging markets. Despite the intention of the authorities to provide a better regulatory environment for most market participants after the financial crisis, banks remain incapable of effective monitoring probably because they themselves have undergone severe restructuring. The lack of monitoring by domestic institutions is consistent with the fact that the mean value of bank holdings declines from 0.104 in the pre-crisis period to 0.043 post-crisis: the incentive to monitor decreases with ownership.

The single equation analyses show the DR dummy variable becomes positive and significant only for the crisis period. This implies that the value of information carried by a DR issue may be particularly important during the crisis period. The simultaneous equation analyses do not support this, however, suggesting the positive relation between the DR dummy variable and firm performance may be spurious. The positive and significant DR dummy variable of the foreign equity ownership equation for the full sample is only sustained for the post-crisis period in the simultaneous equation analyses. This may reflect foreign investors' search for more credible information after the complete market opening.

The full sample analyses in Table 4 and Table 5 show the chaebol affiliation dummy variable is insignificant. The single equation analyses in Table 6 indicate that the chaebol dummy variable is positive and significant in the post-crisis period, supporting the

value-adding hypothesis. In other words, chaebol firms can capitalize on the value-adding benefits of chaebol affiliation, such as internal capital financing and centralized allocation of resources, while agency costs are kept at bay. Two previous studies are insightful to understanding the positive effect of chaebol affiliation on firm performance. Joh (2003) uses a sample of Korean firms between 1993 and 1997, and shows that accounting profitability is negatively and significantly related to the 70 largest chaebol dummy variable. Baek, Kang and Park (2004) analyze a sample of Korean firms during the Asian financial crisis from 1997 to 1998, and find that stock holding period returns are insignificantly or positively and significantly related to the top 30 chaebol dummy variable. The results of these studies indicate that the relation between performance measures and chaebol affiliation may have changed over time. It may be the case if an increase in foreign equity ownership leads to better monitoring by outside blockholders.<sup>12</sup> However, the simultaneous analyses by sub-period do not confirm the value-adding hypothesis as the p-value only drops to 0.16 for the post-crisis period. Although the empirical results are not statistically significant in all cases, they imply that the authorities at least took appropriate actions to moderate agency problems built into chaebols by opening the stock market completely and by implementing other governance-enhancing measures after the financial crisis.

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<sup>12</sup> Family holdings of chaebol firms increased from 24 percent in the crisis period to 32 percent in the post-crisis period. The increase may reflect chaebols' self-defense measures against ever-increasing foreign equity ownership as well as possible takeover attempts. For example, the fourth largest chaebol, SK group, was under a severe takeover attempt by an overseas investment fund in 2003.

[Insert Table 6 around here.]

The statistically significant results on R&D expenditures to sales, current ratio, debt ratio, dividend yield, beta, and firm size variables reported in the single equation analyses are generally sustained in the simultaneous equations analyses. Also, the statistical insignificance of exports to sales, net foreign assets to total assets, and return on assets is largely maintained for both analyses.

#### **4.4 Foreign Board Membership**

The effect of foreign board membership on firm performance is examined in Table 7 by the single equation analysis and two stage least square method (TSLS). We use TSLS to control for endogeneity between foreign board membership and firm performance. The foreign director lagged dummy variable is included as an instrument in the first stage. The sample is confined to the post-crisis period from 1999 to 2002 due to data availability of board composition: 443 firms or 1,329 firm years (?check?). The foreign director lagged dummy variable loses statistical significance as ownership variables are included in the single equation analysis: from 0.114 (p-value is 0.01) to 0.058 (p-value is 0.14). The other coefficient estimates are generally consistent with the post-crisis period results reported in Table 6. The results suggest that foreign investors can additionally exert a positive effect on firm performance by holding board membership. Firms with foreign board members are likely to “import” better or more efficient governance mechanisms, which should contribute to enhanced performance. Foreign board membership also has a signaling effect that a firm willingly exposes itself to more efficient corporate governance mechanisms, and reinforces

its reputation in the financial markets (Oxelheim and Randøy, 2003). TSLS estimation shows almost identical results as the single equation results: the foreign director dummy is 0.078 (p-value is 0.14) in the second stage. In sum, the positive effect on firm performance of foreign board membership shown in the single equation analysis is sustained under the endogenous estimation.

[Insert Table 7 around here.]

## **5. Summary and Conclusions**

Given the relatively underdeveloped domestic capital markets and institutions that are characteristic of emerging markets, foreign equity investors are expected to perform the functions of monitoring and market discipline necessary for effective corporate governance. This study examines whether foreign equity ownership positively affects firm performance through corporate governance mechanisms for Korean firms by using a sample of 443 firms from 1993 to 2002. The Korean stock market was opened for foreign investors in 1992. However, it was not until 1998 in the aftermath of the Asian financial crisis that the stockholding limit on foreign investors was completely lifted. Foreign investment in Korean firms has increased dramatically since the crisis. It is widely credited as a reason for the quick recovery of the Korean economy as well as for the institution of modern corporate governance in Korea. Thus, Korea provides an interesting case in which the potential effects of foreign equity ownership can be tested. The Korean capital markets

have been the subject of recent empirical studies, but these largely focus on the role of chaebols.<sup>13</sup>

Empirical results show that foreign equity ownership and firm performance are jointly determined. Particularly, the results indicate that foreign equity ownership positively and significantly affects Tobin's  $q$ , which is used as a measure of firm valuation and performance. This is consistent with the view that foreign equity investors have been effective monitors, spurring modernization of corporate governance in the Korean capital markets. Such positive effect of monitoring by foreign investors becomes even more important because monitoring by domestic institutions is found to be ineffective. Ironically, it was when the country fell into crisis with foreign investors intent on bargain hunting that a major turning point toward improved corporate governance occurred in Korea with the complete elimination of the foreign stock holding limit. The experience since the crisis shows that foreign institutional investors were at the forefront in advocating improved corporate governance and leading value enhancement in Korea. The empirical findings confirm that the positive effect of foreign equity ownership becomes economically and statistically significant in the post-crisis sample only.

This study shows that the governance-improving role of foreign investors can be systematic in an emerging market where the usual monitoring and disciplinary roles of domestic institutions and markets are relatively limited. Of course, in the Korean case such

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<sup>13</sup> Park, Shin, and Choi (2004) in their panel study of Korean firms, however, show that agency costs measured by entertainment expenses are negatively related to foreign equity ownership.

improvement was possible only after the government was forced to surrender much of its direct control over domestic capital markets to foreign investors in the aftermath of the Asian financial crisis. The corporate governance experience in Korea provides an interesting example of how capital market liberalization was highly effective in improving firm performance by putting into practice better monitoring of management.

Existing studies (e.g., Johnson, La Porta, Lopez-de-Silanes and Shleifer, 2000; Bae, Kang and Kim, 2002; Joh, 2003) suggest that agency costs within a business group reduce the value of member firms because of *tunneling*. The results of this study suggest a possibility that the benefits of group affiliation, such as internal financing and centralized allocation of resources, can positively affect firm performance (Khanna and Palepu, 2000). However, this can be possible only if the negative effects of agency costs and family ownership are effectively countered by external forces represented by foreign investors.

Foreign board membership is also positively related to firm performance. It suggests that local firms could effectively import a more efficient internal corporate governance mechanism by putting foreign directors on the board of directors.

As for limitations of this study, a longer sample of the post-crisis period may be necessary to confirm the joint-determination of firm performance and ownership as well as to investigate the decrease in statistical significance of the foreign equity equation in the post-crisis period. Besides, explicit introduction of regulatory aspects into the analytical framework may shed more light on the role of foreign investors and effects on firm performance.

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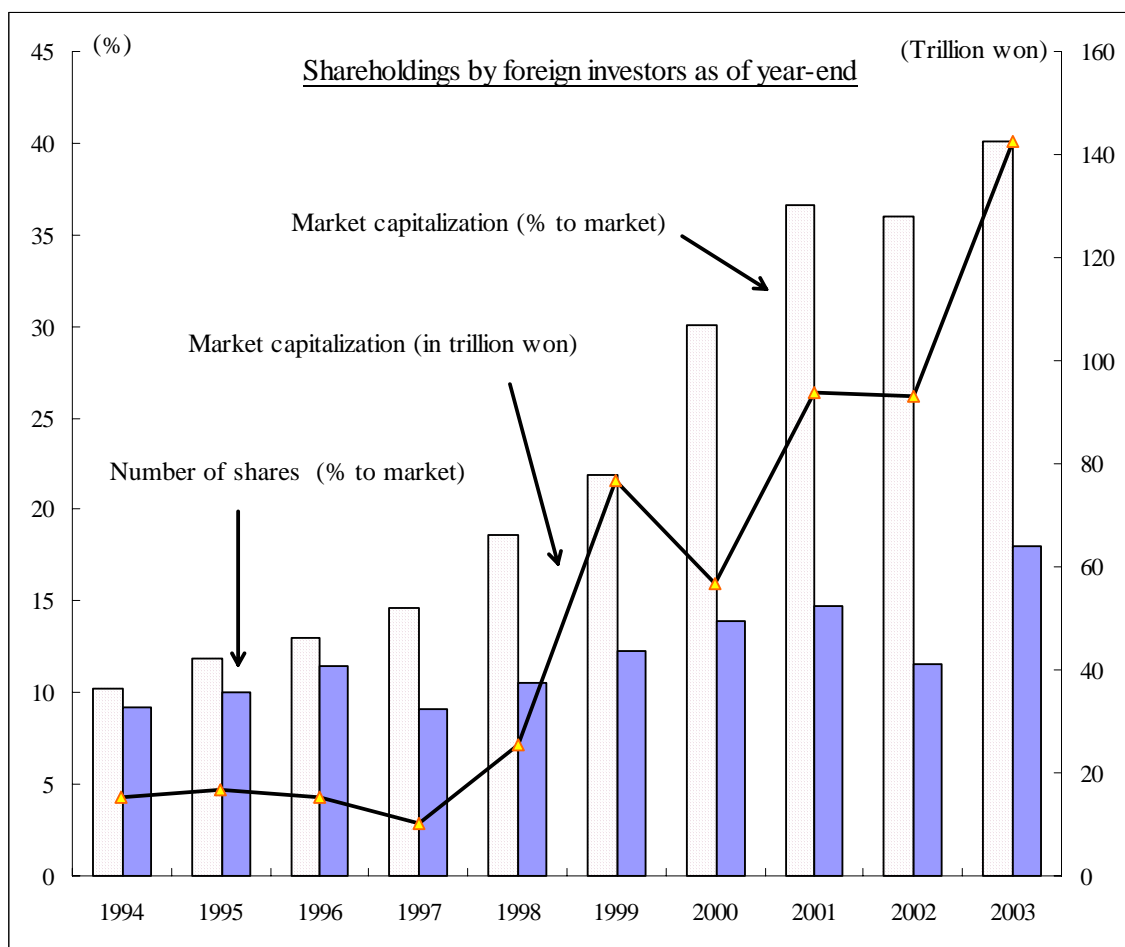


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**Figure 1. Foreign equity ownership**

The figure shows foreign investor holdings as of year-end from 1994 to 2003. The bar graphs indicate the ratios of the number of shares held by foreign investors and the market value relative to the total market, respectively (on the left-hand side scale). The line graph shows the market value of the foreign holdings in trillion won (on the right-hand side scale).



Source: the Korea Stock Exchange

**Table 1 Foreign investor holdings as of year-end**

This table shows foreign investor holdings measured at the end of each year from 1992 to 2003. Transactions by foreign investors show the cumulative transaction volume for a given year. Market capitalization is the market value of the shares held by foreign investors at the end of the year. All foreign investors must register themselves by regulations. The percentage figures are relative to the total Korean stock market. The holding limit per stock imposed on total foreign investors is shown in the last column: the holding limit was abolished as of May 25, 1998 except KEPCO (the sole electricity supplier in Korea) and 20 other regulated firms such as telecommunication firms and defense-related firms (\*).

Year	Transactions by foreign investors				Stockholdings by foreign investors				Total
	Buy		Sell		Number of shares		Market capitalization		holding
	(Trillion won)	(%)	(Trillion won)	(%)	(Billion)	(%)	(Trillion won)	(%)	limit (%)
1992	2.4	2.6	0.9	1.0	0.22	4.1	NA	NA	10
1993	6.4	3.8	2.1	1.2	0.50	8.7	NA	NA	10
1994	6.1	2.7	5.2	2.3	0.63	9.1	15.4	10.2	12
1995	7.6	5.3	6.3	4.4	0.76	10.1	16.7	12.0	15
1996	10.1	7.1	7.0	4.9	0.99	11.6	15.2	13.0	20
1997	11.1	6.8	10.6	6.6	0.82	9.1	9.6	13.7	55
1998	17.3	9.0	11.5	6.0	1.18	10.4	24.4	18.0	100*
1999	45.5	5.2	43.9	5.1	2.32	12.4	79.5	21.7	100*
2000	63.2	10.1	51.8	8.3	2.67	13.8	56.2	30.2	100*
2001	55.2	11.2	47.8	9.7	2.87	14.7	93.7	36.6	100*
2002	83.8	11.3	86.7	11.7	3.05	11.5	93.2	36.0	100*
2003	91.6	16.7	77.8	14.2	4.26	18.0	142.5	40.1	100*

Source: the Korea Stock Exchange, and the Financial Supervisory Service

**Table 2 Descriptive statistics of variables**

The sample consists of 443 firms for the period from 1993 to 2002, measured at the end of the year.

Variable	Number of observations	Mean	Standard deviation	Median	Max	Min	Skewness	Kurtosis
<i>Performance variable</i>								
Tobin's q	4370	0.99	0.43	0.92	9.12	0.16	5.22	60.05
<i>Ownership variables</i>								
Foreign investor holdings	4132	0.06	0.10	0.01	0.86	0.00	3.11	12.80
Bank holdings	4135	0.07	0.10	0.03	0.89	0.00	2.68	12.16
Family holdings	4143	0.29	0.17	0.28	0.99	0.00	0.46	0.19
<i>Board variable</i>								
Foreign director	1771	0.06	0.24	0.00	1.00	0.00	3.67	11.50
<i>Productivity variable</i>								
Log of sales per employee	1569	19.74	0.82	19.71	25.20	17.48	1.04	4.28
<i>Firm characteristics</i>								
Exports/sales	4372	0.27	0.30	0.14	1.00	0.00	0.92	-0.42
Net foreign assets/assets	3636	-0.04	0.11	-0.02	0.71	-0.92	-1.48	10.33
R&D expenditures/sales	4368	0.01	0.02	0.00	0.22	0.00	5.04	41.00
Current ratio	3906	1.44	0.97	1.22	11.58	0.00	3.32	18.47
Debt ratio	4369	0.65	0.31	0.64	8.93	0.04	7.12	140.16
Dividend yield	4169	0.02	0.03	0.01	0.31	0.00	3.37	21.21
Log of sales	4374	25.80	1.51	25.63	31.34	17.26	0.59	1.32
Beta	3982	0.71	0.35	0.73	3.05	-3.98	-0.92	11.01
Return on assets	4320	0.08	0.26	0.06	2.94	-2.95	2.65	42.97
Log of trading volume	4189	16.17	1.82	16.12	25.32	4.70	-0.57	3.65
<i>Dummy variables</i>								
Chaebol-affiliation	4430	0.18	0.39	0.00	1.00	0.00	1.62	0.64
Depository Receipt	4430	0.03	0.17	0.00	1.00	0.00	5.51	28.37
Positive earnings	4366	0.80	0.40	1.00	1.00	0.00	-1.48	0.20

*Definitions of variables*

Tobin's q	The market value of common stock and the book value of preferred stock and book value of total liabilities, divided by the book value of total assets
Foreign investor holdings	The percentage ownership held by registered foreign investors
Bank holdings	The percentage ownership held by commercial banks and other financial institutions except insurance and securities companies
Family holdings	The percentage ownership held by the largest-shareholder family and

	associated shareholders, such as affiliated firms, who are under the control of the largest-shareholder family
Foreign director	A dummy variable to indicate whether the board of directors includes at least one foreign director. The board variables are available for four years from 1999 to 2002.
Log of sales per employee	The natural log of labor productivity measured by the sales per employee, which is collected for the post-Asian financial crisis period from 1999 to 2002.
Exports to sales	The ratio of the exports to total sales
Net foreign assets to total assets	The ratio of the net foreign assets, converted into the Korean won, to total assets
R&D expenditures to sales	The ratio of the research and development expenditures to total sales
Current ratio	The ratio of current assets to current liabilities
Debt ratio	The ratio of the total debts to total assets
Dividend yield	The dividend yield of the common stock
Log of sales	The natural log of the total sales in the Korean won
Beta	The beta coefficient of the market model estimated from daily returns of individual stocks and broad market KOSPI index for the year
Return on assets (ROA)	The ratio of the earnings before interest, tax, depreciation and amortization (EBITDA) to total assets
Log of trading volume	The natural log of the number of total shares traded for the year
Chaebol-affiliation	A dummy variable to indicate whether a firm belongs to one of the 30 largest chaebols. The list of the thirty largest chaebols is updated annually
Depository Receipt	A dummy variable to indicate whether a firm has issued an American Depository Receipt or Global Depository Receipt
Positive earnings	A dummy variable to indicate whether a firm posted positive earnings for the previous financial year

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Sources: The Korea Stock Exchange, the Financial Supervisory Service, the Korea Fair Trade Commission, and the Korea Listed Companies Association

**Table 3 Correlation coefficients of explanatory variables**

This table provides the Pearson correlation coefficients for a pair of explanatory variables. The sample consists of 443 firms and 4,430 firm-years from 1993 to 2002. The variables used are (1) foreign investor holdings, (2) bank holdings, (3) family holdings, (4) exports to sales, (5) net foreign assets to total assets, (6) R&D expenditures to sales, (7) current ratio, (8) debt ratio, (9) log of sales, (10) beta, (11) return on assets, (12) chaebol-affiliation dummy variable, and (13) depository receipt dummy variable. See Table 2 for the definitions of the variables. \*\*\*, \*\*, and \* are used to denote statistical significance at the one, five, and ten percent levels (two-sided), respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(2)	0.11 ***											
(3)	-0.11 ***	-0.27 ***										
(4)	0.08 ***	0.02	-0.03 **									
(5)	-0.06 ***	-0.03 *	-0.02	-0.05 ***								
(6)	0.05 ***	0.03 *	-0.09 ***	0.03 **	0.02							
(7)	0.00	-0.03 *	-0.02	-0.02	0.20 ***	0.05 ***						
(8)	-0.14 ***	0.08 ***	-0.22 ***	-0.07 ***	-0.13 ***	-0.03 **	<b>-0.43</b> ***					
(9)	<b>0.36</b> ***	0.25 ***	-0.07 ***	0.11 ***	-0.16 ***	0.05 ***	-0.27 ***	0.07 ***				
(10)	0.09 ***	0.10 ***	-0.15 ***	0.11 ***	-0.02	0.18 ***	-0.13 ***	0.00	<b>0.30</b> ***			
(11)	0.05 ***	0.05 ***	0.03 **	-0.04 **	0.02	-0.03 **	0.07 ***	-0.19 ***	-0.04 ***	-0.16 ***		
(12)	0.17 ***	0.14 ***	-0.04 ***	0.07 ***	-0.09 ***	0.06 ***	-0.21 ***	0.07 ***	<b>0.50</b> ***	0.19 ***	-0.02	
(13)	<b>0.32</b> ***	0.09 ***	-0.14 ***	0.05 ***	-0.06 ***	0.12 ***	-0.08 ***	-0.02	<b>0.40</b> ***	0.17 ***	-0.01	0.20 ***

**Table 4 The effect of foreign equity ownership on Tobin's q: single equation analysis**

This table provides the results of the single equation analysis. The sample consists of 443 firms and 3,987 firm years from 1994 to 2002. The dependent variable is Tobin's q. Ownership variables are one-year lagged, and all other variables are contemporaneous. Equation (A2) shows the results of the test for nonlinearity between Tobin's q and foreign investor holdings, and Equation (A3) controls for interaction terms with foreign investor holdings. The last column discloses the results of Fama-Macbeth regressions. Fama-Macbeth estimates are obtained by averaging the estimates of nine yearly regressions. See Table 2 for the definitions of the variables. White heteroscedasticity-consistent standard errors are used. The p-values for the t-test for the null of zero coefficient value are shown in parentheses.

Dependent variable: Tobin's q	Panel sample regressions				Fama-Macbeth regressions
	(A1)	(A2)	(A3)	(A4)	(A5)
Foreign investor holdings lagged ( <i>F</i> )	0.315 (0.00)	0.073 (0.54)	0.152 (0.10)	-0.207 (0.23)	0.195 (0.06)
$F^2$		0.683 (0.01)		0.746 (0.01)	
Bank holdings lagged	0.111 (0.16)	0.130 (0.10)	0.085 (0.30)	0.074 (0.36)	0.143 (0.01)
Family holdings lagged	-0.057 (0.21)	-0.050 (0.26)	-0.076 (0.13)	-0.084 (0.10)	-0.064 (0.29)
Chaebol-affiliation	0.024 (0.16)	0.027 (0.11)	0.012 (0.58)	0.012 (0.58)	0.023 (0.19)
Depository receipt	0.023 (0.49)	0.023 (0.49)	-0.091 (0.05)	-0.076 (0.10)	-0.006 (0.88)
$F$ * Banks holdings lagged			0.517 (0.48)	1.043 (0.15)	
$F$ * Family holdings lagged			0.264 (0.25)	0.508 (0.05)	
$F$ * Chaebol affiliation			0.121 (0.34)	0.160 (0.21)	
$F$ * Depository receipt			0.549 (0.02)	0.463 (0.05)	
Tobin's q lagged	0.308 (0.00)	0.307 (0.00)	0.307 (0.00)	0.305 (0.00)	0.416 (0.00)
Exports to sales	0.024 (0.13)	0.021 (0.19)	0.024 (0.14)	0.021 (0.19)	0.000 (0.98)
Net foreign assets to total assets	0.034 (0.29)	0.032 (0.33)	0.029 (0.38)	0.026 (0.43)	0.011 (0.72)
R&D expenditures to sales	1.997 (0.00)	2.032 (0.00)	1.997 (0.00)	2.034 (0.00)	2.069 (0.00)
Current ratio	0.019 (0.01)	0.019 (0.01)	0.020 (0.01)	0.020 (0.01)	0.020 (0.08)
Debt ratio	0.433 (0.00)	0.433 (0.00)	0.432 (0.00)	0.433 (0.00)	0.355 (0.00)
Dividend yield	-1.473 (0.00)	-1.443 (0.00)	-1.458 (0.00)	-1.417 (0.00)	-1.469 (0.00)



Log of sales	-0.035 (0.00)	-0.036 (0.00)	-0.034 (0.00)	-0.035 (0.00)	-0.029 (0.00)
Beta	-0.004 (0.83)	-0.003 (0.88)	-0.007 (0.75)	-0.005 (0.80)	0.009 (0.87)
Return on assets	-0.018 (0.68)	-0.023 (0.60)	-0.019 (0.66)	-0.024 (0.58)	0.076 (0.59)
Constant	1.467 (0.00)	1.491 (0.00)	1.450 (0.00)	1.476 (0.00)	1.002 (0.00)

Year and industry dummy variables are included in all regressions.

Adjusted R-squared	0.403	0.407	0.404	0.409
F-statistics	77.8	76.1	67.9	66.9
p-value (F-statistics)	<0.01	<0.01	<0.01	<0.01
Number of observations	2964	2952	2964	2952

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**Table 5 Simultaneous estimation of firm performance and foreign equity ownership**

This table provides the results of the simultaneous estimation of firm performance and foreign equity ownership by the full information maximum likelihood (FIML) method. Firm performance is measured by Tobin's q. Lagged dependent variables are included. Bank and family holdings are one-year lagged, and all other variables are contemporaneous. The Marquardt algorithm is used in the FIML estimation. The specification of the system of simultaneous equations model is as follow:

$$Y_i = \alpha_i + \beta_i Y_j + \gamma_{im} X_m + \varepsilon_i \quad \text{where } i \neq j, \quad i = j = 1, 2 \quad m \in [1, 29]$$

where  $Y = \{\text{Tobin's q, foreign investor holdings}\}$ ,  $X = \{\text{Tobin's q lagged, foreign investor holdings lagged, banks holdings lagged, family holdings lagged, chaebol affiliation dummy variable, depository receipt dummy variable, exports to sales, net foreign assets to total assets, R\&D expenditures to sales, current ratio, debt ratio, dividend yield, log of sales, beta, return on assets, log of trading volume, positive earnings dummy variable, year and industry dummy variables}\}$ . The sample consists of 443 firms and 3,987 firm years from 1994 to 2002. See Table 2 for the definitions of the variables. The p-values for the t-test for the null of zero coefficient value are shown in parentheses.

Dependent variable	Tobin's q		Foreign investor holdings	
	(Q1)	(Q2)	(F1)	(F2)
Tobin's q			0.039 (0.00)	0.039 (0.01)
Foreign investor holdings	0.426 (0.00)	0.409 (0.00)		
Tobin's q lagged	0.305 (0.00)	0.306 (0.00)		
Foreign investor holdings lagged			0.728 (0.00)	0.725 (0.00)
Bank holdings lagged		0.117 (0.05)		-0.015 (0.33)
Family holdings lagged		-0.055 (0.15)		-0.015 (0.08)
Chaebol-affiliation	0.019 (0.37)	0.020 (0.36)	0.003 (0.36)	0.004 (0.30)
Depository receipt	0.012 (0.75)	0.008 (0.84)	0.029 (0.00)	0.028 (0.00)
Exports to sales	0.022 (0.31)	0.022 (0.31)	0.003 (0.47)	0.003 (0.50)
Net foreign assets to total assets	0.045 (0.56)	0.027 (0.73)		
R&D expenditures to sales	2.057 (0.00)	2.011 (0.00)	-0.123 (0.09)	-0.123 (0.11)
Current ratio	0.019 (0.00)	0.016 (0.01)	0.001 (0.53)	0.001 (0.55)
Debt ratio	0.450 (0.00)	0.436 (0.00)	-0.044 (0.00)	-0.046 (0.00)
Dividend yield	-1.471 (0.00)	-1.445 (0.00)	-0.052 (0.37)	-0.052 (0.37)

Log of sales	-0.035 (0.00)	-0.038 (0.00)	0.012 (0.00)	0.012 (0.00)
Beta	0.005 (0.80)	-0.002 (0.94)	-0.007 (0.28)	-0.007 (0.27)
Return on assets	-0.018 (0.46)	-0.022 (0.36)	0.009 (0.40)	0.008 (0.45)
Log of trading volume			-0.002 (0.17)	-0.002 (0.09)
Positive earnings			0.010 (0.02)	0.011 (0.01)
Constant	1.450 (0.00)	1.528 (0.00)	-0.297 (0.00)	-0.294 (0.00)

Year and industry dummy variables are included in all regressions.

Adjusted R-squared	0.418	0.419	0.640	0.640
Number of observations	2959	2931	2959	2931
Determinant residual covariance	0.0003	0.0003		

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**Table 6 Sub-period analysis**

This table provides the results of the sub-period analysis. The sample consists of 443 firms and 3,987 firm years from 1994 to 2002. The sample is divided into subsamples by period: pre-crisis (1994 ~ 1996), crisis (1997 ~ 1998), and post-crisis (1999 ~ 2002). The first three columns show the results of the single equation analysis by regressing Tobin's q on one-year lagged ownership variables and other control variables. White heteroscedasticity-consistent standard errors are used. The next six columns show the results of the simultaneous estimation of firm performance and foreign equity ownership by the full information maximum likelihood (FIML) method. The Marquardt algorithm is used in the FIML estimation. The specification of the system of simultaneous equations model is as follow:

$$Y_i = \alpha_i + \beta_i Y_j + \gamma_{im} X_m + \varepsilon_i \quad \text{where } i \neq j, \quad i = j = 1, 2 \quad m \in [1, 29]$$

where  $Y = \{\text{Tobin's q, foreign investor holdings}\}$ ,  $X = \{\text{Tobin's q lagged, foreign investor holdings lagged, banks holdings lagged, family holdings lagged, chaebol affiliation dummy variable, depository receipt dummy variable, exports to sales, net foreign assets to total assets, R\&D expenditures to sales, current ratio, debt ratio, dividend yield, log of sales, beta, return on assets, log of trading volume, positive earnings dummy variable, year and industry dummy variables}\}$ . See Table 2 for the definitions of the variables. The p-values for the t-test for the null of zero coefficient value are shown in parentheses.

Dependent variable	Single equation analysis			Simultaneous equation analysis					
	Tobin's q			Tobin's q			Foreign investor holdings		
	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
Tobin's q							0.031 (0.02)	0.047 (0.48)	0.032 (0.24)
Foreign investor holdings				0.152 (0.30)	0.148 (0.46)	0.512 (0.01)			
Tobin's q lagged	0.511 (0.00)	0.210 (0.00)	0.248 (0.00)	0.509 (0.00)	0.233 (0.00)	0.241 (0.00)			
Foreign investor holdings lagged	0.109 (0.33)	0.091 (0.48)	0.412 (0.00)				0.714 (0.00)	0.617 (0.00)	0.749 (0.00)
Bank holdings lagged	-0.014 (0.88)	0.189 (0.31)	0.165 (0.17)	-0.018 (0.85)	0.230 (0.16)	0.159 (0.17)	-0.022 (0.32)	-0.047 (0.36)	0.007 (0.77)
Family holdings lagged	-0.037 (0.47)	-0.030 (0.77)	-0.111 (0.14)	-0.039 (0.51)	-0.048 (0.56)	-0.109 (0.11)	-0.003 (0.84)	-0.068 (0.05)	-0.011 (0.38)
Chaebol-affiliation	-0.017 (0.21)	0.011 (0.52)	0.074 (0.04)	-0.018 (0.51)	0.007 (0.88)	0.064 (0.14)	0.001 (0.78)	-0.002 (0.90)	0.009 (0.17)
Depository receipt	-0.026 (0.41)	0.086 (0.01)	-0.016 (0.80)	-0.029 (0.64)	0.074 (0.52)	-0.042 (0.50)	0.003 (0.68)	0.027 (0.27)	0.040 (0.00)

Exports to sales	-0.008 (0.77)	0.052 (0.06)	-0.011 (0.66)	-0.010 (0.68)	0.046 (0.23)	-0.009 (0.84)	0.001 (0.83)	0.019 (0.21)	-0.002 (0.77)
Net foreign assets to total assets	0.019 (0.77)	0.020 (0.77)	0.053 (0.30)	0.012 (0.91)	-0.004 (0.98)	0.048 (0.74)			
R&D expenditures to sales	2.324 (0.01)	1.279 (0.03)	2.430 (0.02)	2.407 (0.00)	1.149 (0.05)	2.555 (0.00)	-0.228 (0.11)	0.045 (0.85)	-0.140 (0.33)
Current ratio	0.008 (0.47)	0.066 (0.01)	0.012 (0.20)	0.007 (0.61)	0.054 (0.00)	0.010 (0.37)	0.001 (0.71)	0.009 (0.28)	0.001 (0.83)
Debt ratio	0.179 (0.00)	0.473 (0.00)	0.516 (0.00)	0.183 (0.01)	0.475 (0.00)	0.511 (0.00)	-0.033 (0.05)	-0.048 (0.42)	-0.036 (0.14)
Dividend yield	-2.220 (0.00)	-0.610 (0.05)	-1.508 (0.00)	-2.261 (0.00)	-0.523 (0.46)	-1.491 (0.00)	0.326 (0.01)	-0.266 (0.18)	-0.049 (0.57)
Log of sales	-0.021 (0.00)	-0.023 (0.00)	-0.038 (0.00)	-0.023 (0.02)	-0.024 (0.11)	-0.039 (0.01)	0.012 (0.00)	0.015 (0.00)	0.011 (0.00)
Beta	-0.077 (0.00)	-0.158 (0.00)	0.070 (0.04)	-0.074 (0.01)	-0.155 (0.01)	0.068 (0.13)	-0.015 (0.03)	-0.028 (0.33)	0.002 (0.86)
Return on assets	0.017 (0.60)	-0.189 (0.49)	-0.049 (0.64)	0.016 (0.54)	-0.228 (0.00)	-0.059 (0.41)	0.003 (0.74)	0.038 (0.47)	0.016 (0.40)
Log of trading volume							0.000 (0.85)	-0.006 (0.24)	-0.003 (0.15)
Positive earnings							0.001 (0.91)	0.027 (0.07)	0.007 (0.30)
Constant	1.149 (0.00)	0.925 (0.00)	1.307 (0.00)	1.192 (0.00)	0.941 (0.01)	1.351 (0.00)	-0.291 (0.00)	-0.300 (0.03)	-0.264 (0.00)
Year and industry dummies are included in all regressions.									
Adjusted R-squared	0.513	0.180	0.314	0.516	0.225	0.322	0.647	0.457	0.720
Number of observations	951	662	1346	951	654	1326	951	654	1326
F-statistics	51.3	8.7	30.3						
p-value (F-statistics)	<0.01	<0.01	<0.01						
Determinant residual covariance				0.0001	0.0003	0.0004			

**Table 7 Foreign board directors and labor productivity**

This table provides the effect on Tobin's q of the foreign investor participation in the board of directors and labor productivity, respectively. Board participation is indicated by Foreign director: one (zero) indicates the presence (absence) of foreign director(s). Labor productivity is measured by the ratio of total sales to the number of employees. The dependent variable is Tobin's q. Board and ownership variables are one-year lagged, and other variables are contemporaneous. The sample consists of 443 firms and 1,772 firm years from 1999 to 2002, the post-crisis period. See Table 2 for the definitions of the variables. The p-values for the t-test for the null of zero coefficient value are shown in parentheses.

Dependent variable: Tobin's q	(1)	(2)	(3)	(4)
Foreign director lagged ( <i>FDL</i> )	0.054 (0.03)	-0.012 (0.68)		
<i>FDL</i> * Foreign investor holdings lagged		0.341 (0.00)		
Log of sales per employee ( <i>SPE</i> )			0.004 (0.75)	0.006 (0.66)
<i>SPE</i> * Foreign investor holdings lagged				0.019 (0.00)
Tobin's q lagged	0.266 (0.00)	0.265 (0.00)	0.275 (0.00)	0.258 (0.00)
All ownership and control variables, year and industry dummy variables are included in all regressions.				
Adjusted R-squared	0.299	0.299	0.275	0.282
F-statistics	32.2	29.9	28.0	27.1
p-value (F-statistics)	<0.01	<0.01	<0.01	<0.01
Number of observations	1390	1357	1356	1328