Relative Performance Evaluation in CEO Turnovers: Evidence from South Korea during the Financial Crisis of 2007-2008

Joon Young Yoon*

Version: March 19, 2021

This paper empirically examines whether corporate boards benchmark performance against peer firms to evaluate and fire CEOs. By evaluating against the peer CEOs, a rational board would be able to learn about relative difference between the current CEO and potential replacement CEOs given that the peer CEOs are ones the board could hire as a replacement CEO. For identification, this paper exploits the flight of capital from South Korea during the 2007-2008 global financial crisis. Instrumenting for peer performance is based on different degrees of exposure across firms to the market-wide capital flight which then induce different degrees of stock supply shocks. Capital structure left them vulnerable to the capital flight by different degrees depending on how much ownership had been held by foreign investors before the crisis. I find empirical evidence of relative performance evaluation that the boards condition on peer performance to some extent. The likelihood of CEO turnovers increased by 1.2% for every 1% increase in peer performance.

*Stanford University, Department of Economics

1 Introduction

Corporate boards have an incentive to learn about CEOs, and then the boards would either keep the current CEO or replace him/her with the best available candidate.[1] Some CEOs may be doing well simply because their industries are booming while others may be fired for reasons beyond their control. What explains why CEOs get fired or not fired? Are these board decisions explained by firm performance relative to peers? I find empirical evidence of relative performance evaluation.

To learn about how good its current CEO is, a rational board would benchmark firm performance against peer firms. The board could learn the relative quality difference between the current CEO and a potential replacement CEO since the peer firm CEOs are also good candidates for a replacement CEO, so the board could learn about a replacement CEO from the peer CEOs. When the current CEO is doing well, if the peers are doing even better, then the board would be more likely to fire the current CEO and hire a new one because a replacement CEO, possibly one of the peer CEOs, could be better than the current one. The agency theory has another theoretical support for relative evaluation against the peers, risk-sharing benefits in incentive-contracting when agents are exposed to common uncertainties, suggesting that the board may be contractually bound to evaluate against the peer CEOs (Holmstrom, 1982; Diamond and Verrechia, 1982).

A review of prior empirical literature on relative performance evaluation and CEO turnovers shows mixed results. Warner, Watts, and Wruck (1988) examine CEO turnovers from 1963 to 1978 and find that market-adjusted stock returns are a better predictor of CEO dismissals than absolute performance. Morck, Shleifer, and Vishny (1989) find turnovers of top management from 1980 to 1985 equally likely in struggling and booming industries, suggesting evaluation based on relative performance. Others find that market and industry shocks are conditioned from a sample of bank CEO turnovers from 1982 to 1987and from a sample of CEO successions from 1974 to 1986 (Barro and Barro, 1990; Gibbons and Murphy, 1990). These papers show that corporate boards condition on market and industry shocks in evaluation of CEOs. However, a more recent paper by Jenter and Kanaan (2015) finds the opposite evidence that CEOs are significantly more likely to be dismissed after poor industry performance. The absence of relative performance evaluation is also found in CEO compensation (Frydman and Jenter, 2010). Alternatively, the literature on managerial entrenchment (i.e. CEOs maximize tenure and prioritize their compensation at the expense of firm value) posits the lowered CEO entrenchment cost after weak firm performance, which would be consistent with under-conditioned peer performance (Zwiebel, 1996). Fisman, Khurana, Rhodes-Kropf, and Yim (2014) attribute a higher CEO turnover rate after poor firm performance to the increased pressure placed on corporate boards by shareholders.

A final strand of relevant literature finds evidence that corporate governance and internal monitoring mechanisms have become more sophisticated since the 1970s (Holmstrom and Kaplan, 2001; Kaplan and Minton, 2012). The literature suggests that the way in which corporate boards make CEO turnover decisions could also have become more complex over

[1] Corporate boards would dismiss the current CEO when their assessment falls below a certain threshold quality, a function of the expected quality of a replacement CEO and replacing costs (Hirshleifer and Thakor, 1998; Hermalin and Weisbach, 2003; Adams and Ferreira, 2007; Taylor, 2010). More detailed discussion on the theoretical background can be found in Section 2.1.

time. This makes CEO turnover decisions harder for econometricians to disentangle.

To test the dependence of CEO turnovers on endogenous peer performance, an identification strategy is required. One confounding factor is (stock) demand shocks that would affect industry performance, firm performance, and CEO turnovers. Another source of endogeneity is collusion. Other confounding factors are industry-level shocks during the financial crisis. Reverse causality is also a concern since industry performance could go down if there are too many CEO turnovers within an industry.

This paper's main contribution is identification, inspired by a family of the corporate governance literature that often showcases creative instruments and identification strategies, such as the uses of oil price and exchange rate changes as instruments (Bertrand and Mullainathan 2001). I exploit the flight of capital from South Korea during the 2007-2008 global financial crisis. Prior to the financial crisis, overall foreign investment, including stocks, gradually increased to more than $700B until 2007 and fell to less than $500B in 2008 (Figure 1). In December 2007, the share of foreign investment in the Korean stock market was approximately 30% of the total market capitalization. Then, there was an unprecedented net foreign capital outflow from the stock market of $90-100B in 2008, approximately 10% of the average total market capitalization of 2007 (Figure 2).[2]

Instrumenting for peer performance is based on different degrees of exposure across firms to the market-wide capital flight which then induce different degrees of stock supply shocks. Capital structure left them vulnerable to the capital flight by different degrees depending on how much ownership had been held by foreign investors before the crisis. Identification relies on the exogeneity of foreign investor ownership before the crisis. The exclusion restriction requires that firms have no other firm performance response to pre-crisis industry-level foreign investor ownership than through peer performance. Particularly, foreign investor ownership prior to the crisis needs to be uncorrelated with unobserved industry-level factors that might affect firm performance or CEO turnovers. A main concern with the exclusion restriction is that too much capital flight could accompany changes in corporate governance, including CEO turnovers. The robustness check with a subsample, excluding corporate governance changes, suggests that such case is unlikely.

I find evidence of relative performance evaluation that corporate boards condition on peer performance; the likelihood of CEO turnovers increased by 1.2% for every 1% increase in peer performance. I do not quantify to what extent and how well the boards adopt the relative evaluation.

The remainder of the paper is structured as follows. Section 2 describes a model and an identification strategy. Section 3 describes data, and Section 4 reports and discusses empirical results.

2 Model and Identification

This section starts with a brief discussion of theoretical bases behind relative performance evaluation in CEO turnovers, and then discusses an empirical model and identification.

[2]The foreign investment outflow in 2008 is less than $60B in Figure 2 because of reallocation across asset classes.

2.1 Theoretical Background

The statistical decision theory suggests that a rational corporate board would learn about a CEO's quality from firm performance, peer performance, and other available information to decide whether to keep or replace the current CEO. The board would fire the current CEO when the learned quality of the current CEO falls below a certain quality threshold, i.e. the expected quality of a replacement CEO with an adjustment for replacing costs. By evaluating relative to peer firms that are exposed to some common shocks, a rational board would be able to learn the relative difference between the quality of the current CEO and the expected quality of a replacement CEO since peer firm CEOs are potential candidates the board could hire as a replacement CEO. The assumption of the model is the independence of a CEO's quality from business cycles/states.[3]

The standard agency theory suggests another theoretical support for relative evaluation among a group of peer CEOs, risk-sharing benefits in incentive-contracting when agents are exposed to common uncertainties.[4]

Thus, the main testable hypothesis is whether the likelihood of a CEO turnover respond to peer group performance.

2.2 Empirical Model

This is a static model of corporate board's CEO turnover decision, where a corporate board decides to dismiss a CEO based on peer performance, and peers are defined as firms in the same industry.

Firm performance r_i of firm i in industry j is assumed to be a linear function of peer performance $\overline{r}_{ij}$ (where the i subscript is to indicate that peer performance does not include firm i's own performance), capital flight shock $\Delta\lambda_i$, and idiosyncratic shock ε_i:

$$r_i = \beta_0 + \beta_1 \overline{r}_{ij} + \beta_2 \Delta\lambda_i + \varepsilon_i \tag{1}$$

The above empirical specification is to estimate the response of firm performance to peer performance and a capital flight (stock supply) shock. Since an unprecedented foreign capital flight shock is expected to cause a stock supply shock and a price drop, a positive sensitivity is predicted, $\beta_2 > 0$. Analogous to the stock volatility measure beta in the CAPM model, β_1 is an estimate of how correlated firm performance is with the industry/peer performance, so $\beta_1 > 0$ is predicted.

The empirical specification of corporate board's CEO turnover response to peer group performance is:

$$\Pr(CEOturnover_i) = \alpha_0 + \alpha_1 \overline{r}_{ij} + \alpha_2 \lambda_i + \nu_i \tag{2}$$

where λ_i is how much ownership in firm i had been held by foreign investors right before the crisis in 2007.

The coefficient of interest is α_1, the sensitivity of the CEO turnover likelihood to peer group performance. If a corporate board practices relative performance evaluation and

[3]For more theoretical discussions, see Holmstrom (1982), Gibbons and Murphy (1990), Hirshleifer and Thakor (1998), Hermalin and Weisbach (2003), Adams and Ferreira (2007), and Taylor (2010).

[4]For more theoretical discussions, see Holmstrom (1982) and Diamond and Verrechia (1982).

benchmark against its peer firms, then the board would be more likely to replace the current CEO when peers are doing better, hence $\alpha_1 > 0$.

In Equation 2, peer performance $\overline{r}_{ij}$ is used as a regressor. Using a relative firm performance measure, such as $r_i - \overline{r}_{ij}$, as a regressor would raise an endogeneity concern through some unobserved CEO quality in firm performance r_i, which correlates the measure with the error term in the CEO turnover regression and biases the estimate.

I estimate Equation 2 via an instrument variable strategy, and the instrument for peer group performance is the pre-crisis foreign investor ownership, aggregated across peer firms. Firm's own foreign investor ownership λ_i may be correlated with the instrument, so I control for it. The instrument variable strategy is discussed in more details in the next section.

2.3 Identification

As a proxy for the degree of the unprecedented capital flight within a firm $\Delta\lambda_i$ during the crisis, I use how much ownership had been held by foreign investors right before the crisis in 2007, λ_i; higher foreign investor ownership prior to the crisis implies more exposure to the capital flight and possibly a greater stock supply shock and a price drop. Using a proxy for the capital flight shock is not a concern since the main use of the capital flight shock is as an instrument, so there is no need to estimate the exact effect of the capital flight shock on firm performance.

Peer performance is instrumented by different degrees of exposure across industries to the capital flight shock. Intra-industry variation is also exploited by having a "Bartik" style instrument and excluding a firm's own capital flight shock. The instrument is the aggregated pre-crisis foreign investor ownership across peer firms in industry j excluding firm i:

$$\widetilde{\lambda}_i = \frac{1}{n(S_j) - 1} \sum_{k \neq i, k \in S_j} \lambda_k \tag{3}$$

where S_j is the set of peer firms in industry j, and $n(S_j)$ is the number of firms in industry j.

The inclusion restriction of an instrument likely hold since the pre-crisis ownership by foreign investors is the upper limit of the capital withdrawal during the crisis. Identification relies on the exogeneity of how much ownership was held by foreign investors prior to the financial crisis. The exclusion restriction requires that firms have no other firm performance response to peer firms' pre-crisis foreign investor ownership than through peer group performance. The identifying assumption is that foreign investor ownership prior to the crisis needs to be uncorrelated with industry-level unobservable factors that affect firm performance or CEO turnovers.[5]

3 Data

For publicly traded firms in South Korea, the list of top executives and the composition of shareholders are disclosed by the Financial Supervisory Service, and historic stock price data

[5]More discussions on the capital flight, exclusion, and identification concerns can be found in Sections 1 and 4.1.

are available at the Korea Stock Exchange. Despite the availability of panel data, the year of interest is only 2008 for an identification purpose. Following the capital flight, the sample period for CEO turnovers is set to be 1) 2008 and 2) 2008-2009. No time subscript is used throughout the paper. Industries are defined at the SIC industry division level and classified into 14 groups.

Firms with missing top executives/shareholders as well as delisted and bankrupted firms are dropped from the sample. The final sample is 858 firms. There could be a selection bias since the errors from the sample selection process and firm's return process are likely to be correlated. Except for a difference in firm sizes, the dropped firms show comparable characteristics to the sample firms in Table 8. Bigger firms would more likely be risk-averse and have higher replacement costs, so they are less incentivized to turn over CEOs, implying a negative bias against finding the conditioning on peer performance, i.e. against finding the evidence of relative performance evaluation.

The main independent variable is ownership by foreign investors (in percentage) prior to the crisis in 2007. The top executive database indicates CEO turnovers as well as the number of CEOs. The shareholder database indicates corporate governance changes.

4 Results

4.1 Summary Statistics

Table 1 presents an overview of the data set. Panel A summarizes foreign investor's ownership in 2007 as well as changes in 2008. Panel B reports the frequency of CEO turnovers. The sample has 218 firms with at least one CEO turnover, the turnover rate of 25.3%, higher than the what the prior literature reports. However, 14.3% of the sample firms having multiple CEOs could partially rationalize the higher turnover rate.[6]

I examine pre-treatment trends. Panel C explores the extent to which two groups, 485 "treated" firms whose foreign investor shares decreased in 2008 and 373 "controlled" firms whose foreign investor shares remained in 2008, differ in observables prior to the crisis. Figure 3 visualizes the existence of a parallel pre-treatment trend in the foreign investor ownership prior to 2008. Panel C of Table 1 reports firm characteristics, firm performance, and CEO turnovers in 2006 for the two group. The two groups show comparable performance and CEO turnovers, but the treated firms are larger in size than the controlled firms. This may not be a major concern since bigger firms would more likely be risk-averse and have higher replacement costs, so they are less incentivized to turn over CEOs, implying that the direction of a bias is against finding the evidence of relative performance evaluation.

4.2 Results: Firm Performance

This section estimates the effects of peer performance and the capital flight, proxied by foreign investor ownership prior to the crisis, on firm performance. A firm performance measure is firm's stock return, and a peer performance measure is a market-cap-weighted

[6] A back-of-the-envelope calculation gives 18-20% as the probability of an individual CEO turnover.

industry return: $\overline{r}_{ij,2008} = \sum_{k \neq i, k \in S_j} w_k r_{k,2008}$ (where S_j is the set of firms in industry j, w_k is the market cap weight of firm k, and $\sum w_k = 1$). The peer performance is instrumented by the industry-level pre-crisis foreign investor ownership.

For firm i in industry j, the empirical specification is:

$$r_{i,2008} = \beta_0 + \beta_1 \overline{r}_{ij,2008} + \beta_2 \lambda_{i,2007} + \varepsilon_{i,2008} \tag{4}$$

In Table 2, the stock returns respond to the capital flight shock negatively and to peer performance positively across specifications, consistent with the predictions. Column 6 presents the instrument variable results, the first stage and F-stat of which are reported in Table 3. The peer effect estimate of 66% is corrected upward from the OLS estimate in Column 4, not consistent with stock demand shock or collusion (which would have amplified the effect) but consistent with industry-level measures alleviating fluctuations. Column 3 relative to Column 5 also shows a negative bias of the OLS estimate. The bias could partially be attenuation due to a measurement error from the use of the capital flight shock proxy.

In Column 6, the effect of the capital flight shock is estimated to be -.87%, i.e. every 1% more foreign investor ownership leads to a .87% drop in firm performance. A downward bias on the OLS estimate in Column 4 is consistent with stock demand shocks, amplifying the negative impact of the capital flight on firm performance.

4.3 Results: CEO Turnovers

This section estimates the effect of peer performance on CEO turnovers. The empirical specification of the CEO turnover process is:

$$\Pr(CEOturnover_{i,2008}) = \alpha_0 + \alpha_1 \overline{r}_{ij,2008} + \alpha_2 \lambda_{i,2007} + \nu_{i,2008} \tag{5}$$

Table 4 shows that the CEO turnover probability increases by 1.2% for every 1% increase in peer performance in Column 2. Conditioning on peer performance in the turnover decision suggests relative performance evaluation. The downward bias on the OLS estimate may be attributed to collusion, which would lead to less distinguishable performance across peers or make the CEO replacement costs higher. The rest of the bias may be attributed to a measurement error or policy measures that alleviate bad industry-level shocks.

Firm's own foreign investor ownership is a control, so I avoid over-interpretation of the coefficient α_2. Though the CEO turnover probability increases by 2.5% for every 1% greater pre-crisis foreign investor ownership, this does not necessarily imply that the boards evaluate CEOs based on bad performance caused by the capital flight. The coefficient estimate may capture the boards' adjustment for bad firm performance caused by firm's capital flight relative to bad peer performance caused by peer firms' capital flight, which is still consistent with the relative performance evaluation framework.

4.4 Robustness Check and Extensions

The results are subject to several robustness checks. In Columns 3 and 4 of Table 4, the results are robust under a probit specification. Panel B of Table 4 expands the observation

period of CEO turnovers to two years, 2008 and 2009, but shows no significance. This weaker association of the CEO turnovers with peer performance in the longer term is consistent with the exogenous and unprecedented nature of the capital flight shock and its sudden short term effect. In Table 5, Columns 1 and 2 exclude firms that had changes in corporate governance, which could also affect CEO turnovers. The results are robust, suggesting that the CEO turnovers were not simply part of corporate governance changes. Columns 3 and 4 exclude firms whose foreign investor ownership increased in 2008 and show robustness, suggesting that the results are not driven by the inflow of capital.

Table 6 examines heterogeneous responses by conglomerate subsidiaries and independent firms. Peer performance remains statistically significant for conglomerates but not independent firms. However, F-stats in Columns 3 and 4 suggest that the regressions for independent firms may suffer from a slight weak instrument problem. The association of relative performance evaluation especially with conglomerate subsidiaries may be due to their characteristics that make their boards' relative evaluation more likely, such as having more replacement CEOs and more comparable firms to benchmark against.

I examine the expansion and contraction of leadership roles. I regress an indicator of whether a firm increased or decreased the number of leadership roles in 2008 on peer performance. Peer performance is estimated to have no impact on the expansion or contraction of leadership roles, suggesting that neither leadership expansion nor contraction is replacement of CEOs, so relative evaluation is less likely to be practiced.

5 Conclusion

To examine whether corporate boards benchmark performance against peer firms to evaluate and fire CEOs, I exploit the flight of capital from South Korea during the 2007-2008 global financial crisis and instrument for peer group performance based on degrees of exposure across firms to this market-wide capital flight. Capital structures left firms vulnerable to the capital flight by different degrees depending on how much ownership had been held by foreign investors before the crisis. I find that corporate boards condition on peer performance; the likelihood of CEO turnovers increased by 1.2% for every 1% increase in peer performance. The results suggest some degree of relative performance evaluation though I do not examine to what extent and how well the boards adopt the relative evaluation. The contribution of this paper is in identification, demonstrating a way to exploit a crisis or recession in corporate governance research.

References

[1] Adams, Renee B., and Daniel Ferreira 2007, "A theory of friendly boards," *Journal of Finance*.

[2] Barro, Jason R., and Robert J. Barro 1990, "Pay, performance, and turnover of bank CEOs," *Journal of Labor Economics*.

[3] Bertrand, Marianne, and Sendhil Mullainathan 2001, "Are CEOs rewarded for luck? The ones without principals are," *Quarterly Journal of Economics*.

[4] Diamond, Douglas W., and Robert E. Verrecchia 1982, "Optimal managerial contracts and equilibrium security prices," *Journal of Finance*.

[5] Fisman, Ray, Rakesh Khurana, Matthew Rhodes-Kropf, and Soojin Yim 2013, "Governance and CEO turnover: Do something or do the right thing?," *Management Science*.

[6] Frydman, Carola, and Dirk Jenter 2010, "CEO compensation," *Annual Review of Financial Economics*.

[7] Gibbons, Robert, and Kevin J. Murphy 1990, "Relative performance evaluation for chief executive officers," *Industrial and Labor Relations Review*.

[8] Hermalin, Benjamin E. 2005, "Trends in corporate governance," *Journal of Finance*.

[9] Hermalin, Benjamin E., and Michael S. Weisbach 2003, "Boards of directors as an endogenously determined institution: A survey of the economic literature," *Economic Policy Review*.

[10] Hirshleifer, David, and Anjan V. Thakor 1998, "Corporate control through board dismissals and takeovers," *Journal of Economics and Management Strategy*.

[11] Holmström, Bengt 1982, "Moral hazard in teams," *Bell Journal of Economics*.

[12] Holmström, Bengt, and Steven N. Kaplan 2001, "Corporate governance and merger activity in the United States: Making sense of the 1980s and 1990s," *Journal of Economic Perspectives*.

[13] Jenter, Dirk, and Fadi Kanaan 2015, "CEO turnover and relative performance evaluation," *Journal of Finance*.

[14] Kaplan, Steven N., and Bernadette A. Minton 2012, "How has CEO turnover changed? Increasingly performance sensitive boards and increasingly uneasy CEOs," *International Review of Finance*.

[15] Morck, Randall, Andrei Shleifer, and Robert W. Vishny 1989, "Alternative mechanisms for corporate control," *American Economic Review*.

[16] Taylor, Lucian A. 2010, "Why are CEOs rarely fired? Evidence from structural estimation," *Journal of Finance*.

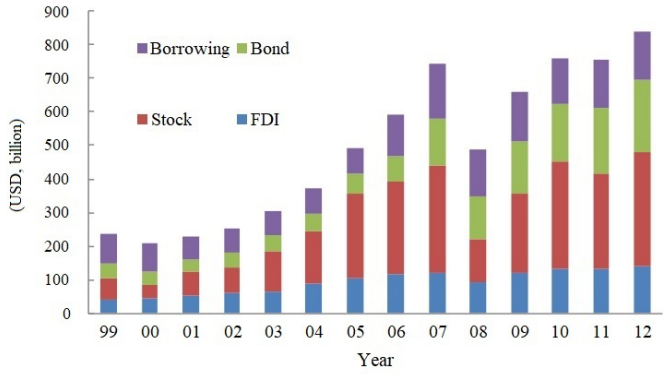
[17] Warner, Jerold B., Ross L. Watts, and Karen H. Wruck 1988, "Stock prices and top management changes," *Journal of Financial Economics*.

[18] Warther, Vincent A. 1998, "Board effectiveness and board dissent: A model of the board's relationship to management and shareholders," *Journal of Corporate Finance*.

[19] Wooldridge, Jeffrey M. 2002, "Econometric analysis of cross section and panel data," *The MIT Press*.

[20] Zwiebel, Jeffrey 1996, "Dynamic capital structure under managerial entrenchment," *American Economic Review*.

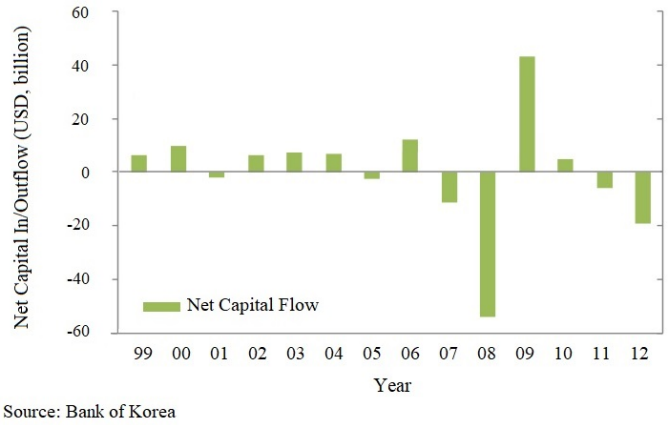
Figure 1: Foreign Investment Balance from 1999-2012



Source: Bank of Korea

This figure presents valuation-adjusted foreign investment balances for different asset classes. Prior to the financial crisis, the foreign investment balance gradually increased to more than $700B in 2007 but fell to less than $500B in 2008. In December 2007, the share of foreign investment in the stock market was about 30% of the total market capitalization of around $1T.

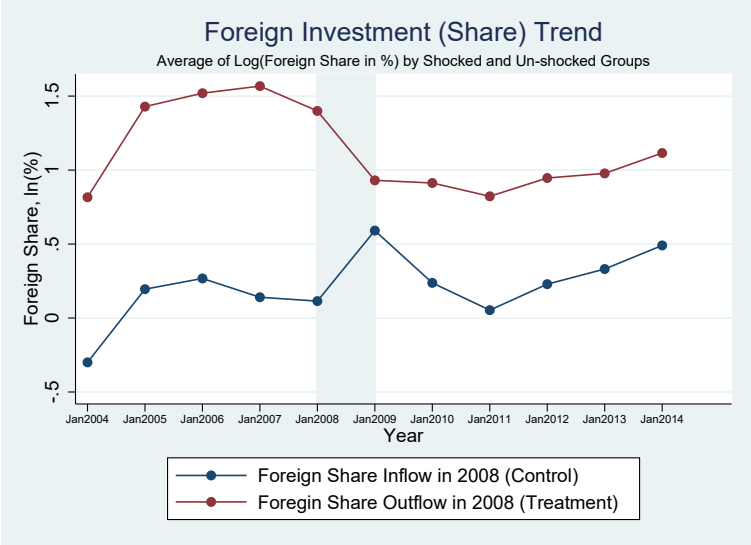
Figure 2: Net Foreign Capital In/Outflow from 1999-2012



Source: Bank of Korea

This figure presents net annual foreign capital in/outflows, aggregated across asset classes, and shows an unprecedentedly large net foreign capital outflow in 2008, suggesting unexpected capital flight during the financial crisis.

Figure 3: Pre-trend in Foreign Investment



This figure illustrates a parallel pre-treatment trend in foreign investor share changes (shown by the log of foreign investor shares) prior to the financial crisis between two groups of firms, 485 "treated" firms whose foreign investor shares dropped in 2008 and 373 "controlled" firms whose foreign investor shares remained in 2008.

Table 1: Summary Statistics

Panel A: Foreign Investment

	Mean	SD	Min	Max
Foreign Investor Ownership Change in 2008 (Δ%)	-1.48	4.80	-32.5	35.5
Foreign Investor Ownership as of Dec 2007 (%)	9.26	13.9	0	85.9

Panel B: CEO Turnover

Number of firms	Number of firms with at least one CEO turnover in 2008	Number of firms with at least one CEO turnover in 2008 and 2009	Number of firms with more than one CEO as of Dec 2007
858	218 (25.3%)	327 (37.9%)	123 (14.3%)

Panel C: "Treatment" and "Control" Groups

Year = 2006	"Treatment" (450 of 485 firms)		"Control" (334 of 373 firms)	
	Mean	SD	Mean	SD
Firm Characteristics				
Market Cap (KRW, billion)	1,280	6,800	238	661
Conglomerate	.569	.496	.374	.485
Firm age (years)	26.9	15.8	28.3	16.7
Foreign Investor Ownership (%)	13.4	17.2	5.80	12.0
Performance				
Stock return (%)	5.88	41.9	4.38	48.3
Industry return (%)	4.90	13.1	4.11	13.3
Management Turnover				
Number of CEOs	1.22	.486	1.15	.382
CEO Turnovers in 2008	.249	.433	.231	.422
CEO Turnovers in 2008-9	.384	.487	.329	.471

This table presents an overview of the data set. Panel A summarizes foreign investor shares. Panel B shows the number of observations, the frequency of CEO turnovers, and the proportion of firms with more than a single CEO in the sample. A back-of-the-envelope calculation gives the individual CEO turnover rate of 18-20%. Panel C shows pre-treatment comparability in firm characteristics, performance, and CEO turnovers in 2006 between the two groups, 450 firms whose foreign investor share dropped in 2008 and 334 firms whose foreign investor shares remained in 2008. The 2006 data are unavailable for the sample firms that went public in 2007.

Table 2: Firm Performance on Peer Performance and Capital Flight

DEP VAL: Firm Performance	OLS (1)	OLS (2)	OLS (3)	OLS (4)	IV (5)	IV (6)
Pre-crisis Foreign Investor Ownership	-1.17*** (.337)	-.720** (.271)		-.908** (.294)		-.869*** (.256)
Peer Performance			.670*** (.135)	.571*** (.142)	.781*** (.152)	.659*** (.126)
Industry FE	No	Yes	No	No	No	No
Number of Firms	858	858	858	858	858	858
R^2	.095	.311	.130	.185		
F-stat (1st stage)					19.9	10.9

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

These regressions examine the effect of capital flight and peer performance on firm performance. The performance measures are stock returns. Industry fixed effects are controlled in Column 2. Columns 5 and 6 are IV regressions where peer performance is instrumented by the industry-level pre-crisis foreign investor ownership. Standard errors in parentheses are clustered at the industry level.

Table 3: First-Stages of IV Estimation

DEP VAL: Peer Performance	First Stage (5)	(6)
Industry Pre-crisis Foreign Investor Ownership	-.708*** (.159)	-.697*** (.167)
Pre-crisis Foreign Investor Ownership		.008 (.005)
F-stat	19.9	10.9
Number of Firms	858	858
R^2	.208	.186

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

This table shows the first-stage results of Columns 5 and 6 of Table 2, the response of peer performance to the industry-level average foreign investor ownership. The second column is also the first stage result for Column 2 of Table 4. Standard errors in parentheses are clustered at the industry level.

Table 4: CEO Turnover Regressions

Panel A: CEO turnovers in 2008

DEP VAL:	Linear Prob Model		Probit Model	
Pr(CEO Turnover in 2008)	OLS	IV	Probit	IV Probit
	(1)	(2)	(3)	(4)
Pre-crisis Foreign	.0234***	.0250***	.0608***	.0658***
Investor Ownership	(0.00533)	(0.00448)	(0.0149)	(0.0134)
Peer Performance	.00810	.0116**	.0206	.0316*
	(.00558)	(.00563)	(.0147)	(.0167)
Constant	.640**	.767***	.347	.741
	(.224)	(.236)	(.591)	(.690)
Number of Firms	858	858	858	858
F-stat (1st stage)		10.9		

Panel B: CEO turnovers in 2008 and 2009

DEP VAL:	Linear Prob Model		Probit Model	
Pr(CEO Turnover in 2008-9)	OLS	IV	Probit	IV Probit
	(1)	(2)	(3)	(4)
Pre-crisis Foreign	.00740	.00738	.0234	.0232
Investor Ownership	(.00683)	(.00768)	(.0227)	(.0275)
Peer Performance	-.00242	-.00246	-.00818	-.00842
	(.00399)	(.00544)	(.0125)	(.0198)
Constant	.629***	.628***	.283	.275
	(.170)	(.196)	(.523)	(.697)
Number of Firms	858	858	858	858
F-stat (1st stage)		10.9		

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

This table estimates the effect of peer performance on the CEO turnover probability. The dependent variable is an indicator of whether there was a CEO turnover during the observation period. The observation periods for Panels A and B are 2008 and 2008-9 respectively. Standard errors in parentheses are clustered at the industry level.

Table 5: CEO Turnover Regressions in Subsamples

SUBSAMPLE:	No Corporate Governance Change		Foreign Investor Share Drop	
PERIOD:	2008	2008-9	2008	2008-9
DEP VAL:	IV	IV	IV	IV
Pr(CEO Turnover)	(1)	(2)	(3)	(4)
Pre-crisis Foreign	.0252***	.00883	.0388***	.000542
Investor Ownership	(.00499)	(.00777)	(.00870)	(.0108)
Peer Performance	.0129**	-.00218	.0126**	-.00342
	(.00514)	(.00577)	(.00619)	(.00564)
Constant	.806***	.620***	.690***	.651***
	(.218)	(.211)	(.238)	(.184)
Number of firms	824	824	485	485
F-stat (1st stage)	11.87	11.87	15.43	15.43

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

This table re-estimates Column 2 of Table 4 but uses two subsamples. In Columns 1 and 2, the sample firms that had corporate governance changes in 2008 are excluded. In Columns 3 and 4, the subsample is limited to the 485 firms, whose foreign investor shares decreased in 2008. Standard errors in parentheses are clustered at the industry level.

Table 6: CEO Turnover for Conglomerate Subsidiaries and Independent Firms

SUBSAMPLE:	Conglomerate Firms		Independent Firms	
PERIOD:	2008	2008-9	2008	2008-9
DEP VAL:	IV	IV	IV	IV
Pr(CEO Turnover)	(1)	(2)	(3)	(4)
Pre-crisis Foreign	.0254***	.00461	.0146**	.0160**
Investor Ownership	(.00491)	(.00820)	(.00674)	(.00762)
Peer Performance	.0122**	-.00275	.00172	.00504
	(.00566)	(.00523)	(.00582)	(.00559)
Constant	.800***	.658***	.249	.432**
	(.239)	(.187)	(.203)	(.194)
Number of firms	412	412	446	446
F-stat (1st stage)	12.34	12.34	8.41	8.41

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

This table re-estimates Column 2 of Table 4 in two subsamples. In Columns 1 and 2, the subsample is limited to conglomerate subsidiaries. In Columns 3 and 4, the subsample is limited to independent firms. Standard errors in parentheses are clustered at the industry level.

Table 7: Expansion and Contraction of Leadership

DEP VAL:	Expansion	Contraction
	IV	IV
	(1)	(2)
Pre-crisis Foreign	.000497	.0131**
Investor Ownership	(.00119)	(.00538)
Peer Performance	.00100	-.000514
	(.00152)	(.00458)
Constant	.0565	.0976
	(.0620)	(.195)
Number of Firms	858	858
F-stat (1st stage)	13.1	13.1

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

This table estimates the effect of peer performance on expansion and contraction of leadership roles, the number of CEOs. In 2008, 3% and 7% of the sample firms show expansion and contraction in leadership, respectively. Standard errors in parentheses are clustered at the industry level.

Table 8: Sample Selection

Year = 2008	Sample Firms (858 firms)		Out-of-sample Firms (444 firms)	
	Mean	SD	Mean	SD
Firm Characteristics				
Market Cap (KRW, billion)	911	4,461	326	1,415
Firm age (years)	27.9	16.5	22.9	15.3
Conglomerate	.480	.500	.455	.499
Performance				
Stock return (%)	-41.3	25.7	-41.6	37.9
Industry return (%)	-34.7	10.0	-37.3	8.72
Management Turnover				
Number of CEOs	1.17	.431	1.20	.469
CEO Turnover in 2008	.252	.434	.399	.490
CEO Turnover in 2008-9	.379	.485	.527	.500

This table shows the comparability between the sample and out-of-sample firms. 444 out-of-sample firms have missing information for foreign investor ownership.