Predicting Firms' Corporate Governance Choices: Evidence from Korea[†]

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Abstract

This paper contributes to a new literature on how regulatory, industry, and economic factors affect firms' corporate governance practices. In an earlier paper (Black, Jang and Kim, *Does Corporate Governance Affect Firms' Market Values? Evidence from Korea*, 2004), we construct a corporate governance index (*CGI*) for almost all listed Korean public companies and report strong evidence that higher *CGI* predicts higher firm market values. In this paper, armed with this strong index, we investigate the factors that predict a firm's score on *CGI* and the five subindices that comprise *CGI* (shareholder rights, board structure, board procedure, disclosure to investors, and ownership parity). We explore the relative importance of regulatory, industry, and firm-specific factors. Regulatory factors are highly important. Industry factors are also important. Firm-specific factors are less important and have only a modest effect on governance, even when they are statistically significant.

Among firm-specific factors, the most significant are size (larger firms are better governed), firm risk (riskier firms are better governed) and long-term profitability (more profitable firms are *worse* governed). Other papers find firm growth to be significant, but use crude industry and regulatory controls. We find that long-term firm growth predicts governance with 2-digit industry dummies but this effect disappears with 4-digit industry dummies. Industry-level growth predicts *CGI* more strongly than firm growth. Need for equity finance --a measure that combines growth (positively) and profitability (negatively) -- predicts better governance; this effect is driven by the negative relationship between profitability and *CGI*. Long-term averages of growth, profitability and equity finance need are stronger than short-term averages, suggesting that firms alter governance slowly in response to economic factors. Ownership by the largest shareholder is sometimes but not reliably significant. The effect of growth, profitability, and need for equity finance on *CGI* is important for small firms (assets < 2 trillion won), which are subject to weaker governance rules, and for non-chaebol firms (which may have less access to chaebol-supported financing), but not for large firms or *chaebol* firms.

Key words: Korea, corporate governance, corporate governance index, law and finance, firm valuation, growth and corporate governance, outside finance and corporate governance, insider ownership and corporate governance.

JEL classification: G32, G34

I. Introduction

Corporate governance is a hot subject. In the U.S., in response to Enron, WorldCom and other scandals, the Sarbanes-Oxley Act mandates extensive changes in the governance of publicly traded firms; and the New York Stock Exchange and Nasdaq have strengthened their governance-related listing rules, including requiring listed firms to have a majority of independent directors.[1] Internationally, weak corporate governance is cited as an important driver of the East Asian and other financial crises (Johnson et. al, 2000). The World Bank and the OECD have launched major corporate governance initiatives, and corporate governance legal reforms and voluntary corporate governance codes are proliferating around the world.

Private-sector corporate governance rankings are also proliferating, including those launched by Deminor in 2000, by Credit Lyonnais Securities Asia (*CLSA*) in 2001, by Standard and Poor's in 2001, by Institutional Shareholder Services in 2002, and by The Corporate Library and GovernanceMetrics in 2003. It remains unclear, however, whether governance changes imposed by law or regulation will improve firm performance, or simply impose a one-size-fits-all straitjacket on companies. We also do not know whether the private-sector governance rankings measure anything useful about firm value or performance, nor do we know much about what factors affect firms' governance choices.[2]

This paper contributes to a new line of research that investigates the factors that influence firms' corporate governance choices (call these *governance prediction* studies). It is related to studies that assess whether an overall governance index predicts firm value or performance (call these *governance-to-value studies*). (Some researchers combine both types of studies in the same paper.) Recent governance-to-value studies (Black, 2001; Black, Jang and Kim, 2004; Durnev and Kim, 2004, Klapper and Love, 2003) provide evidence that firms' overall corporate governance can affect market values in emerging markets. This should give firms an incentive to improve their governance. Yet similar firms often make very different governance choices. This suggests either that some firms' insiders do not understand the link between governance and share prices, or that other factors, such as desire to preserve private benefits, outweigh interest in

[1] New York Stock Exchange Listed Company Manual § 303A; National Association of Securities Dealers Rule 4350.

[2] See, for example, Sonnenfeld (2003) ("the governance peddlers uncritically staple together every governance reform dimension regardless of the existence of research support"), Monica Langley, "Making the Grade: Want to Lift Your Firm's Rating on Governance? Buy the Test," *Wall Street Journal*, June 6, 2003 (cover story about the ISS ranking system); Ken Brown and Robin Sidel, "Scoring Boards on Governance Has Its Risks," *Wall Street Journal*, Oct. 2, 2002; Ken Brown, "Weak Boardrooms and Weak Stocks Go Hand in Hand," *Wall Street Journal*, Sept. 9, 2003.

share price. Either way, we need to better understand the factors that predict firms' governance choices.

In a prior governance-to-value paper (Black, Jang and Kim, 2004), we construct a corporate governance index (*CGI*) for almost all Korean listed companies in 2001 and provide strong evidence from both ordinary least squares (*OLS*) and instrumental variable regressions that better governance predicts higher share prices. This effect is economically large: A worst to best change in governance predicts a roughly 160% increase in share price. In this paper, we begin with this highly predictive index, turn the lens around, and ask what factors predict governance. We study the relative importance of regulatory, industry, and firm-level factors in predicting both *CGI* and the five subindices that comprise *CGI* -- Shareholder Rights, Board Structure, Board Procedure, Disclosure, and Ownership Parity.

Regulatory factors are highly important. Their importance, coupled with the power of *CGI* (including the elements of *CGI* that are driven by legal rules) to predict firms' market value, suggests that many Korean firms do not choose their governance to maximize share price. Industry factors are also important. Firm-specific factors are less important and, even when statistically significant, are often economically modest and sensitive to model specification.

Among firm-specific factors, the most significant are firm size (larger firms are better governed), firm risk, proxied by standard deviation of share price (riskier firms are better governed) and long-term profitability (more profitable firms are *worse* governed, perhaps because they have less need for outside capital). Need for equity finance --a measure that combines growth (positively) and profitability (negatively) -- predicts better governance. This effect is driven by the negative relationship between profitability and *CGI*. Long-term averages of growth, profitability and equity finance need are stronger than short-term averages, suggesting that firms alter governance slowly in response to economic factors. Ownership by the largest shareholder is sometimes but not reliably significant. Growth, profitability, and need for equity finance are important for small firms (assets < 2 trillion won), which are subject to weaker governance rules, and for non-chaebol firms (which may have less access to chaebol-supported financing), but not for large firms or *chaebol* firms.

Governance prediction studies such as this one face some important econometric issues. Two involve different forms of endogeneity. One form of endogeneity involves reverse causation. Governance may predict firm-level economic factors, rather than vice-versa. For example, more profitable firms may choose better (weaker) governance, but it is also possible that better-governed firms are more profitable. Second (call this *optimal differences*), firms may endogenously and optimally choose different governance practices, such as different ownership patterns (Demsetz and Lehn, 1985). Endogeneity is a concern for firm-level variables, but not for regulatory or industry variables. A third important problem is omitted

variable bias. In equilibrium, corporate governance likely correlates with various economic variables, which also correlate with each other. A study that omits important economic variables could conclude that an included variable is significant when it would not be with better control variables; or that a variable is insignificant when it would be significant with better controls.

Three governance prediction studies are comparable to this paper. Two of these, by Durnev and Kim (2004) and Klapper and Love (2003), also study firms' governance choices in emerging markets. The third, by Gillan, Hartzell and Starks (2003), studies U.S. firms. This paper has a number of strengths, relative to the comparison emerging markets papers. We summarize these here and explain the differences with more care in *Part II.A.*

First, we begin with a governance index that strongly predicts firms' market values, and thus an index that has real-world importance. In contrast, the *CLSA* index (used by Durnev and Kim and Klapper and Love), and the S&P disclosure index (used by Durnev and Kim) have important weaknesses and unclear predictive value.

Second, this paper is the first to adequately address omitted variables concerns. Omitted variable bias is an important issue in governance prediction research. To give one example of the sensitivity of our results to the inclusion of other control variables, Durnev and Kim and Klapper and Love both find that firm growth predicts better governance. We similarly find that long-term firm growth predicts governance with similar control variables and 2-digit industry dummies, based on Korea Industrial Classification codes. However, the predictive power of firm growth weakens when we add additional control variables and disappears if we switch to 4-digit industry dummies.

Omitted of relevant control variables can also result in an variable appearing to be insignificance, when it would be important with stronger controls. arise when a study omits some relevant explanatory variables. Our results for firm size illustrate this effect. We find that firm size strongly predicts better governance. In contrast, Durnev and Kim and Klapper and Love find mixed results for firm size. This may reflect a combination of the broader range of firm sizes in this study and our more extensive control variables. Firm size becomes *stronger* as an explanatory factor as we add other control variables. Ownership by the largest shareholder also strengthens considerably as we add other control variables.

Third, we can make at least some progress on endogeneity issues. We lack good instrumental variables that could directly address endogeneity. However, our related work provides evidence that *CGI* likely causally predicts the market value of Korean firms, and that firm value does *not* predict governance. This simplifies the nature of any remaining endogeneity. Also, our use of extensive control variables limits the potential for the optimal differences flavor of endogeneity.

Fourth, we study all listed Korean firms, both large and small. In contrast, Durnev and Kim and Klapper and Love are multicountry studies which include only the largest firms in each country.

Fifth, we study the relative importance of regulatory, industry, and firm-level factors, and conclude that regulatory factors are most important, industry factors next most important, and firm-level factors least important. Durnev and Kim and Klapper and Love do not investigate either industry effects or within-country regulatory effects.

Sixth, we simply obtain different results than Durnev and Kim or Klapper and Love for the firm-level variables that are common to these studies. Our strongest predictive power is for firm size (positive), firm risk (positive), and profitability (negative). Durnev and Kim and Klapper and Love find mixed results for firm size and do not study firm risk or profitability.

Seventh, we study the robustness of our results for different subsamples, and for subindices. We find important, often sensible, but occasionally puzzling differences between subsamples and between subindices.

Finally, we (uniquely) study how quickly firms alter their governance in response to changes in economic factors. This response is quite slow. Coefficients and significance levels are much higher for long-term (roughly 7-9-year) averages of firm growth, profitability, and equity finance need than for shorter-term (2-4 year) averages of these variables.

The limited power of firm-level factors in a governance-prediction study like this one is *good news* for governance-to-value studies. A core econometric issue for governance-to-value studies is the reverse causation and optimal differences flavors of endogeneity. In most countries, good instruments that would permit an instrumental variable analysis, to directly address endogeneity, are not available; Korea is an exception. Suppose now that a governance-to-value study finds in *OLS* that a governance index predicts firm market value. If governance-prediction studies find that firm-level factors predict only a modest fraction of firms' governance choices, and some of that predictive value is consistent with involves firms improving governance to attract outside capital, optimal differences is likely not a central problem for governance-to-value studies. This makes it more likely that the *OLS* correlation between governance and firm market value is causal. The risk of optimal differences flavor of endogeneity can be further reduced if the governance-to-value study uses, as control variables, the industry and firm-level variables that predict governance in governance-prediction studies.

For our own Korea-based governance-to-value study, unique features of Korean rules let us identify a strong instrument for governance (an asset size dummy at 2 trillion won, the size level above which firms are subject to several important governance rules). We confirm that the predictive value of *CGI* for firms' market value is stronger in an instrumental variable framework

than in *OLS* and find no evidence of endogeneity. The limited predictive power of firm-level factors that we find here is consistent with the lack of endogeneity that we report there.

This paper proceeds as follows. *Part II* reviews the related literature. *Part III* discusses our data set and the construction of our corporate governance index (*CGI*). *Part IV* provides an overview of regulatory, industry, and firm-specific factors that affect *CGI*. *Parts V and VI* discuss firm-level and industry effects in greater detail. *Part VII* concludes.

II. Related Literature

A. Governance-Prediction Studies

Our research is most directly related to two contemporaneous studies of the factors that affect firms' governance choices in emerging markets (Durnev and Kim, 2004) and Klapper and Love, 2003)). It is also related to the contemporaneous study of U.S. firms by Gillan, Hartzell and Starks (2003) and to the contemporaneous study by Klapper, Laeven and Love (2003) of narrower study of two specific governance provisions (voting by mail and cumulative voting) in four transition countries.

We offer here a detailed comparison with Durnev and Kim and Klapper and Love. Durnev and Kim present a model in which firms that need to raise capital improve their governance. They find that firm growth and need for equity finance separately predict better governance, as does higher inside ownership. Klapper and Love find that firm growth predicts better governance and capital intensity predicts worse governance. The principal differences and extensions in this paper are as follows.

First, we use a corporate governance index that, from our earlier work (Black, Jang and Kim, 2004) likely causally predicts higher market values in both *OLS* and an instrumental variable framework. Durnev and Kim and Klapper and Love report much weaker *OLS* results for the *CLSA* and *S&P* indices. Klapper and Love do not attempt an instrumental variable approach. Durnev and Kim do so, but their instruments are suspect. They assume that industry does not affect governance. In contrast, both we and Gillan, Hartzell, and Starks (2003) find that industry does affect governance. Durnev and Kim also assume that a firm's market-model α and β values do not affect Tobin's *q*. However, there is both theoretical and empirical reason to believe otherwise (Shin and Stulz, 2000, and this paper). Moreover, the *CLSA* and *S&P* indices have important weaknesses. The *CLSA* index is partly based on analysts' subjective views, which could be biased by their knowledge of stock returns; while the *S&P* index addresses only disclosure, rather than a full range of governance measures.

Second, we study the entire universe of listed firms, both large and small, in a single country. In contrast, Durnev and Kim and Klapper and Love study only the largest firms across a number of countries. Yet, as we show (*Table 4*) large firms make different governance

choices than smaller firms and likely differ in other ways, notably in their access to public capital markets.

Third, we address omitted variable bias by using a broad set of control and explanatory variables In contrast, Durnev and Kim and Klapper and Love use more limited regulatory, industry, and firm-level variables. In fairness to these studies, they devote substantial attention to across-country-level effects, leaving less space to study the within-country effects that we study here.

We find evidence that extensive control variables are important. For example, a central results for both Durnev and Kim and Klapper and Love is a positive correlation between firm growth and governance. We find a similar correlation with 2-digit industry dummies but this effect weakens when we add control variables and disappears when we switch to 4-digit industry dummies. Conversely, unlike these other studies, we find that firm size strongly predicts better governance. This effect strengthens as we add control variables. It may be masked in studies with limited control variables, presumably due to a positive (negative) correlation between firm size and other variables that predict worse (better) governance.

Fourth, we simply find different results than Durnev and Kim or Klapper and Love. We find predictive power for variables that they find to be unimportant (firm size) or do not study (firm risk). We do not find robust predictive power for other variables, notably firm growth, that they report to be important.

Fifth, we (uniquely) investigate how quickly firms alter their governance in response to changes in firm-level economic factors, and find evidence suggesting that this response is quite slow. Coefficients and significance levels are much higher for long-term averages of firm growth, profitability, and equity finance need than for shorter-term averages of these variables. The power of these variables peaks for roughly 7-9 year averages, and long-term averages are often significant when shorter-term averages are not. We find no evidence that firms have the foresight to alter their governance to reflect expected *future* economic factors, when these differ from the firm's historical experience.

Sixth, we study the relative importance of regulatory, firm-specific, and industry factors that influence governance choices. In Korea, regulatory factors are the most powerful, followed by industry effects and firm effects, in predicting firms' governance choices. Klapper, Laeven and Love (2003) also report that firm-level factors have limited value to predict firms' proxy voting and cumulative voting rules in four Eastern European countries. Durnev and Kim and Klapper and Love do not investigate industry factors. Prior research suggests that industry effects are important. Gillan, Hartzell and Starks (2003) find evidence that industry factors and firm-level factors are roughly equally important for U.S. firms governance choices; Agrawal and Knoeber (2001) find that industry affects board composition; Kole and Lehn (1999) report

evidence that firms alter their governance in response to industry deregulation. Durnev and Kim and Klapper and Love study regulatory factors across-countries but not across-firms within a single country.

Seventh, we find sharply different patterns for the factors that predict the subindices of *CGI* than for *CGI* as a whole, especially for the Disclosure and Ownership Parity subindices. We also study various subsamples, and again find large differences in the factors that predict *CGI*. Growth, profitability, and equity finance need are important for small firms and for non-*chaebol* firms, but not for large firms or *chaebol* firms. Some of these differences have sensible explanations; a few are puzzling. Durnev and Kim look at subindices only briefly; neither Durnev and Kim nor Klapper and Love study subsamples.

B. Governance-to-Value Studies

[discussion to come]

C. Country-Level Governance

[discussion to come]

D. Cross-Listing Studies

[discussion to come]

III. Data and Construction of Corporate Governance Index

A. Sample and Data Sources

We construct a corporate governance index based primarily on responses to an extensive 2001 survey of governance practices by the Korea Stock Exchange (*KSE*). The *KSE* sent the survey to the disclosure officers of all listed companies; 540 of the 560 surveyed companies responded. The reliability of the responses should be high because the KSE has quasi-regulatory authority over listed companies. We exclude 5 banks that were wholly owned by the government, 9 firms without ownership data, and one firm that was acquired soon after the survey was completed, leaving a sample of 525 firms.[3]

We take balance sheet and income statement data from the *TS2000* database, maintained by the Korea Listed Companies Association, the list of companies affiliated with the top-30 *chaebol* from press releases by the Korean Fair Trade Commission, and stock market and share

[3] At the time of the survey, the *KSE* had 699 listed companies. It did not survey 139 companies that were on a watch list for possible delisting. These companies account for only about 1.75% of KSE market capitalization. Consistent with our agreement with the *KSE*, we do not discuss individual companies in this paper. An English translation of the survey and an explanation of which survey variables we included in our index, and why, are available from the authors on request.

ownership data from a *KSE* database. Data for all control variables is available for 517 firms. Thus, sample size varies from 517-525 depending on which control variables we use. *Tables 3A* and *3B* show summary statistics and a correlation matrix for the principal variables used in this paper. Industry classification is based on either 2-digit or 4-digit Korea Industrial Classification (*KIC*) codes.

B. Construction of the Corporate Governance Index

We describe the construction of our Korean Corporate Governance Index (CGI) in Black, Jang and Kim (2004), and provide only a summary here. From the *KSE* survey, we extract 39 usable governance elements. We classify these elements into five subindices: Shareholder Rights (5 elements); Board Structure (4 elements on board composition and the existence of audit and outside director nominating committees); Board Procedure (26 elements); Disclosure (3 elements); and Ownership Parity (1 element). Ownership parity is defined as 1 - *ownership disparity*, with ownership disparity defined as ownership by all affiliated shareholders - direct ownership by the largest shareholder. A number of other papers, including Claessens, Djankov, Fan and Lang (2002), Joh (2003), Durnev and Kim (2004), and La Porta, Lopez-de-Silanes, Shleifer and Vishny (2002), use a similar variable, sometimes called "wedge."[4] *Table 1* lists the elements of each subindex and provides summary statistics.

We combine elements into subindices, and combine subindices into an overall corporate governance index (*CGI*), as follows. Each element other than ownership parity is a 0-1 dummy variable that indicates whether a firm has a particular governance element. Ownership parity is a continuous 0-1 variable. To compute multielement subindices, we sum a firm's score on the nonmissing elements of a subindex, divide by the number of nonmissing elements, and multiply this ratio by 20. For Ownership Parity Subindex, we multiply the ownership parity element by 20. Thus, each subindex has a value between 0 and 20. We define *CGI* as the sum of the subindices; it has a value between 0 and 100, with better-governed firms having higher scores.

Figure 1 shows a histogram of the corporate governance index, *CGI*. A normal distribution curve is superimposed. The distribution of corporate governance index is skewed to the right (skewness coefficient = 1.5671). *Table 3A* provides summary statistics for *CGI* and each subindex. The mean (median) for *CGI* is 32.69 (29.80); the minimum is 12.53, and the maximum is 86.93. *Table 3C* provides a correlation table for *CGI,* each subindex, and an asset

[4] We define the largest shareholder as the individual or firm that, together with its related parties, holds the largest number of shares. Related parties include relatives, affiliated firms, and company directors. One can imagine more sophisticated ownership measures that more directly capture the direct economic stake of the controlling individual or family, but these are not feasible to implement in Korea.

size dummy at 2 trillion won (this variable has strong regulatory importance, as we explain below). All correlations are positive; almost all are significant.

IV. Overview of Regulatory, Industry, and Firm Factors

This part presents our results on firm-level and regulatory factors that predict a firm's corporate governance. *Table 4* presents our initial *OLS* results. We also provide, often in footnotes, detailed comparisons to Durnev and Kim (2004) and Klapper and Love (2003) where they use the same or a similar independent variable. Sections *A-C* provide an overview of regulatory, industry, and firm-level factors. Section *D* presents results for selected firm-level factors. Sections *E* and *F* present results for subindices, *reduced indices* (*CGI* minus one subindex), and selected subsamples. Part V considers in more detail three firm-level factors -- growth, profitability, and equity finance need. Part VI considers industry factors in more detail.

A. (Mostly) Regulatory Factors

We consider in this section the principal wholly or partly regulatory factors that affect a firm's corporate governance level. *Table 4, regression (1)* includes the most important regulatory variables plus 2-digit industry dummies.

Large versus small firms. As discussed in Black, Jang and Kim (2004), *large* Korean firms (assets > 2 trillion won) are subject to several important corporate governance rules that do not apply to *small* firms (assets < 2 trillion won). The principal requirements for large firms in 2001 were: 50% outside members of the board of directors (versus 25% for small firms), an audit committee of the board with at least 2/3 outside members, and an outside director nominating committee. To capture this regulatory effect, we use an asset size dummy variable at 2 trillion won as an explanatory variable. Asset size dummy is highly significant in all specifications of our OLS regression. In what we will call our *base 4-digit regression*, with full control variables and 4-digit industry dummies (*Table 4, regression (5)*), large firms have roughly 15 points higher *CGI* scores than small firms.

Bank dummy. Banks are subject to the same board composition and audit committee rules as large firms, so we expect them to have high governance scores. To capture this effect, we include a dummy variable for membership in the banking industry. The bank dummy variable is significant in all specifications. In our base 4-digit regression, banks have roughly 17 points higher *CGI*. Banks may have economic reasons to choose different governance, independent of regulatory requirements. Thus, the bank dummy should be understood as a mixed regulatory and industry variable.[5]

[5] In the Korean industry classification scheme, banking is not a separate industry, even at the 4-digit classification level. See *Table 9A*.

SOE dummy. We define a state-owned-enterprise (*SOE*) dummy variable to equal 1 for six large firms that are or were majority state-owned. Four of these firms (Korea Gas Corporation, Korea Heavy Industries and Construction, Korea Telecom, and Korea Tobacco and Ginseng) were subject in 2001 to special corporate governance rules under the State Owned Enterprise Management Improvement and Privatization Act. Pohang Iron and Steel, was fully privatized by 2001 but was formerly subject to these rules and likely retained its prior governance. Korea Electric Power is not covered by the Act but is majority state-owned and likely faces pressure to conform its governance to this Act. This variable is positive in all specifications, significant with 2-digit industry dummies, and marginally significant with 4-digit industry dummies. It takes a coefficient of 7 points in our base 4-digit regression, suggesting that SOE firms have roughly 7 points higher *CGI*.

Some caveats. First, Korea Tobacco and Ginseng is the only publicly traded firm in its 4-digit industry; Korea Telecom is one of 3 firms in its 2-digit and 4-digit industry; and Korea Electric Power and Korea Gas Corp. are two of the 10 firms in their 2-digit and 4-digit industry. Thus, the *SOE* dummy likely includes some industry as well as regulatory effects. Conversely, the 4-digit industry dummies likely capture some effect of *SOE* status on *CGI*. This suggests that the significant 10-point coefficient from a regression with 2-digit industry dummies (*Table 4, regression (4)*) may be a better guide to the effect of *SOE* status than the marginally significant 7 point coefficient with 4-digit industries. Second, three of the six *SOE* firms also have level 2 or 3 *ADR*s; while three of the six firms with level 2/3 *ADR*s are *SOE*s. In regressions that include an *ADR* (level 2/3) dummy, the coefficient on *SOE* dummy drops to about 4.5 points and becomes insignificant. There is a significant risk that the *SOE* dummy (*ADR* level 2/3 dummy) is partly picking up an *ADR* (*SOE*) effect. Third, the *SOE* dummy may capture some firm-level factors that affect the governance of these large, high-market-share firms.

Importance of regulatory factors. The overall importance of these wholly or partly regulatory factors is suggested by the 0.5944 adjusted R^2 for regression (1). If we remove industry dummies from regression (1), adjusted R^2 is still 0.589 (see the table below). Thus, almost 60% of the variation in *CGI* is predicted by our three regulatory variables.

These regulatory variables are important almost exclusively for large firms. All large firms are (obviously) large, as are all six *SOE*s and 11 of the 13 banks in our sample. Thus, for a subsample of 454 small firms, asset size dummy and *SOE* dummy drop out of the regression. Bank dummy equals 1 for only 2 firms and produces an adjusted R^2 of only .042.

B. Industry Factors

We defer full examination of industry factors to *Part VI*. We note, however, that they are important in the aggregate. For example, adding 4-digit industry dummies to a regression that

includes the basic regulatory factors discussed above (asset size dummy, bank dummy, and *SOE* dummy) increases adjusted R^2 from 0.589 to 0.621. Once there, adding firm size increases adjusted R^2 to 0.639, and adding an extensive set of other firm-level variables buys a further increase only to 0.662 in our base 4-digit regression. The table below shows adjusted R^2 values for regressions that use a constant term plus various combinations of other variables.[6]

Adjusted R^2 for Different Sets of Independent Variables

Independent Variables	All firms	Small firms	Large firms
2-digit industry dummies only	0.1354	0.0314	0.0493
4-digit industry dummies only	0.2308	0.1009	0.2093
Regulatory variables only	0.5889	0.0424	0.3155
Regulatory variables plus 4-digit industry dummies	0.6213	0.1269	0.3401
Regulatory variables, 4-digit industry dummies, and ln(assets)	0.6390	0.1499	0.4427
4-digit industry dummies and full control variables	0.6624	0.2134	0.5487
Sample size with full control variables	517	454	63

One can also see the importance of industry effects by comparing our basic 2-digit and 4-digit regressions (*Table 4, regressions (4) and (5)*). In level of fineness, two-digit *KIC* industries are between 1-digit and 2-digit industries based on U.S. Standard Industrial Classification (*SIC*). Four-digit KIC industries are similar in fineness to 2-digit *SIC* industries. Moving from 2-digit to 4-digit industries significantly changes the coefficients on a number of other variables. For example, the coefficient on sales growth drops from 10.6 (t = 2.49) to an insignificant 4.5. At the same time, other coefficient strengthen, including those on ln(assets) and ownership.

Industry effects are less important for small firms. The adjusted R^2 for a regression with only 4-digit industry dummies is only 0.1009 for small firms, compared to 0.2308 for all firms and 0.2093 for large firms. One likely explanation is that large firms cluster in particular industries. Industry dummies may therefore pick up part of the effect of the (omitted) regulatory variables, especially asset size dummy.

There is a tension in any cross-sectional study in choosing the fineness of industry controls. Finer controls reduce degrees of freedom and can mask the effect of economic variation across industries. Yet crude controls may lead one to ascribe power to economic factors, when these factors merely proxy for correlated industry factors. In our judgment, 2-digit *KIC* industries are crude enough so that if a coefficient is significant with 2-digit industries, but smaller and insignificant with 4-digit industries -- as is the case for firm growth -- one should not place much

[6] This analysis is exploratory only. We plan to conduct a systematic principal components analysis of the relative importance of different variables in the next draft.

weight on the 2-digit result. Thus, in discussing firm-level factors that predict corporate governance, we will give primary weight to 4-digit results.

C. Firm-Level Factors: Overall Importance and Omitted Variables Issues

In *Table 4*, we study an extensive set of firm-level economic variables. As Himmelberg, Hubbard, and Palia (1999) stress, if firm value and governance are determined simultaneously and endogenously, almost any variable that affects a firm's market value may also affect its governance. This makes a broad set of independent variables valuable, to limit omitted variables concerns. Our discussion below focuses on regressions with *CGI* as the dependent variable. However, for greater comparability with Durnev and Kim (2004), we also show results with *CGI* - Parity as the dependent governance variable and Ownership Parity Index as an additional control variable (*Table 4, regression (7)*).

We find a number of significant results, discussed below. However, perhaps our most important conclusions for firm level factors involves the limited economic importance of these results. We discuss this issue first.

1. Limited Importance of Economic Variables; Implications for Endogeneity

A striking aspect of our analysis is how little effect most firm-level economic variables have on governance. We have already seen in *Section B* that adding a large set of firm-level variables only modestly increases R^2. Here is another way to assess the importance of firm-level variables. Multiply each firm's value for each economic variable times the coefficient on that variable from our base 4-digit regression, and sum the results. This provides, for each firm, an estimate of the total predicted effect of all economic variables on *CGI*. The standard deviation of these values then provides a measure of the overall importance of economic variables in predicting *CGI*.

Our results for this approach are shown below. The firm-level economic variables with the largest predicted effect on *CGI* are firm size and firm risk. We report below the standard deviation of the predicted effect on *CGI* for all firm-level economic variables, all firm-level variables except firm size, and all except firm size and firm risk.

Firm-Level Variables	**standard deviation of predicted effect on *CGI***	
	all firms	**Small firms**
all economic variables	4.06	2.88
all except size	2.52	2.42
all except size and firm risk	1.93	1.53
total standard deviation of *CGI*	**11.68**	**7.24**

These modest results are disappointing for governance-prediction studies such as this one. The firm-level effects we are studying are economically small. At the same time, they provide

comfort for governance-to-value studies. A major econometric issue for these studies is endogeneity risk, especially the "optimal differences" risk that both governance and firm value are simultaneously and endogenously determined by firm characteristics. This study suggests that optimal differences endogeneity exists but is not large.

To quantify this effect, note that the overall standard deviation (variance) of *CGI* is 11.68 points (136.42 points^2). Any respectable governance-to-value study must include controls for firm size and industry. Once this is done, the predictive value of extensive firm-level economic variables is a standard deviation (variance) of only 2.52 points (6.35 points^2). The ratio of variances (analogous to contribution to R^2) is firm-level variance/total variance = 6.35/136.42 = .047. If share trading data is available, so that one can also control for firm risk, this strengthens the inference that optimal differences endogeneity is likely not a major problem in governance-to-value studies.[7]

2. The Importance of Omitted Variables Issues

In our regressions, when we find a significant result for a firm-level factor, the result is often turns sensitive to which other control variables we include in the regression. Some interactions are understandable, but some are puzzling -- there is no obvious reason to expect a strong interaction between two (or a cluster of) independent variables.

The difference between results with 2-digit and 4-digit industries, discussed above, illustrates the importance of control variables. In *Table 4*, we reinforce this point by progressively adding plausible economic and control variables in a 2-digit framework in regressions (2-4), and then switching to 4-digit industries in regression (5). Regression (2) adds firm-level variables, comparable to those used by Durnev and Kim and Klapper and Love. We then progressively add additional variables in regressions (3-4). As we do so, sales growth progressively loses power. So does profitability (measured by net income/assets), although profitability remains significant. At the same time, the coefficient on firm size [proxied by ln(assets)], and on ownership by the largest shareholder become progressively stronger.

We offer below additional examples of the sensitivity of our results to choice of control variables. In our judgment, results from papers that use more limited control variables and robustness checks, including those in Durnev and Kim, 2004, and Klapper and Love, 2003, are not reliable. We obtain similar results to theirs for our sample if we use similar control

[7] Industry can be safely treated as exogenous. Firm size and firm risk are not clearly exogenous. Both variables plausibly affect both governance and firm value (proxied, say, by Tobin's *q*, market/book, or another size-adjusted metric). This, without more, does not create an endogeneity problem in assessing whether a governance index predicts firm value, while controlling for firm size and firm risk. Endogeneity arises only if governance strongly affects firm size or risk. This is possible, but a large effect seems unlikely to us.

variables, but different results if we use more extensive control variables.

In the end, the firm-level variables that we find to be reliably important are:

- firm size (which is not important in Durnev and Kim and Klapper and Love)
- firm risk (which they do not study)
- firm profitability (which Klapper and Love do not study, and Durnev and Kim study only indirectly)

In contrast, we fail to find a reliable effect for the variables they emphasize, including:

- sales growth (positive and significant in both studies)
- equity finance need (positive and significant for Durnev and Kim, not studied by Klapper and Love)
- PPE/sales (negative and significant for Klapper and Love, negative and sometimes significant for Durnev and Kim)

An important contribution of this paper, which emerges only from the details of robustness checks, is to highlight how sensitive the results of governance prediction studies can be to the choice of control variable and (sometimes) of subsample.

D. Results for Firm-level Economic Variables

Even if the overall effect of firm-level variables on governance is modest, we need to understand which variables are important and assess whether the patterns make sense. We therefore discuss below the effect of each control variable on *CGI*. We hypothesize that firms change their governance slowly in response to economic factors, and therefore use long-term measures of geometric average sales growth and arithmetic average profitability (net income/assets) over the 8-year period from 1993-2000.[8] We choose an 8-year period because it roughly maximizes the predictive power of growth and profitability. We report results for other measurement periods in *Table 7* and discuss these results in *Part V*.

Firm size. Larger firms are more complex, and therefore may need more refined corporate governance measures. *Table 4* supports this hypothesis. Ln(assets) is significant in all specifications, and becomes stronger as we add additional independent variables. In our base 4-digit regression, a factor of 10 increase in firm size predicts a ln(10) x 1.96 = 4.5 point increase in *CGI*. We obtain similar results in regressions (not shown) that substitute ln(sales) for ln(assets).

These results contrast with the weaker results for firm size found by Durnev and Kim (2004) and Klapper and Love (2003), Klapper and Love use the *CLSA* governance index and find

[8] We use an arithmetic rather than a geometric average for profitability because a geometric average cannot sensibly handle firms with positive earnings in some years and negative earnings in other years.

a generally insignificant coefficient on ln(sales). Durnev and Kim report that ln(assets) predicts *stronger* disclosure on the *S&P* disclosure index, *weaker* scores on the *CLSA* shareholder protection subindex, and is insignificant for the overall *CLSA* index. Our stronger results for firm size likely emerge because our extensive control variables control more effectively for other variables that correlate with firm size and predict corporate governance.[9] Our results also contrast with the results for the U.S. reported by Gillan, Hartzell, and Starks (2003), who find that larger firms have *worse* governance. However, this is principally because large U.S. firms hare stronger takeover defenses, which are an important component of their governance index. Takeover defenses are irrelevant for most Korean firms and are not part of our governance index.

Sales Growth. Other factors equal, a faster growing firm has greater need to raise outside capital. It may choose better governance to increase the availability or reduce the cost of outside capital (Durnev and Kim, 2004, Klapper and Love, 2003). In *Table 4*, regression (2), with limited control variables, comparable to those used by Durnev and Kim and Klapper and Love, there is a strong correlation (coefficient = 18.56; t = 4.49) between *CGI* and sales growth. However, the coefficient on sales growth declines from roughly 19 to 11 as we add control variables in regressions (3-4). The coefficient then drops to 4.6 and becomes insignificant when we switch to 4-digit industries in regression (5). Moreover, even in a 2-digit framework, the practical importance of sales growth is modest. In regression (4), a one-standard-deviation (10%) increase in sales growth predicts a 11.30 x 0.10 = 1.13 point increase in *CGI*; for regression (5), the predicted effect is only a 4.55 x 0.10 = 0.5 point increase in *CGI*. In robustness checks, we substitute asset growth for sales growth and obtain similar results.

Our results contrast with Durnev and Kim (2004) and Klapper and Love (2003), who find a significant positive coefficient on sales growth. However, these studies use limited control variables. Thus, the difference between our full-control-variable results and their results may reflect omitted variable bias in their studies.[10]

Profitability. If need for outside capital influences firms' governance choices, then more profitable firms should have *worse* governance, other things equal, because they generate more

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[9] The obvious candidate here is firm risk, which predicts higher *CGI* and has a strong negative correlation (r = -0.33) with firm size. If we omit ln(assets) from our base 4-digit regression, the coefficient on ln(assets) drops to about 1.48, but remains highly significant (t = 3.40). Conversely, if we remove ln(assets), the coefficient on firm risk drops to 29.2 and becomes only marginally significant.

[10] Gillan, Hartzell and Starks (2003), in their study of U.S. firms, use Tobin's q rather than growth to proxy for growth opportunities. They find a marginally significant positive correlation between Tobin's q and their governance index. However, Tobin's q can proxy for management quality as well as growth opportunity, and could be a result of governance, as easily as a cause. Gillan et. al also find a marginally significant positive coefficient on Tobin's q as a predictor of board governance. This result is in tension with Bhagat and Black (2002), who report evidence that firms with *poor* performance, measured by Tobin's q, increase their board independence.

capital internally and need less outside capital. Less profitable firms may also be more likely to improve their governance because they hope that this will improve profitability, or investors pressure them to do so. On the other hand, better-governed firms may be more profitable. The first two effects predict a negative sign on firm profitability; the third predicts a positive sign (due to reverse causation).

We use net income/assets as our measure of profitability because it corresponds to firms' need for external capital to finance growth. Higher profitability correlates with *lower CGI*. However, the practical importance of this effect is modest. In our base 4-digit regression, a one-standard-deviation (.04) increase in net income/assets predicts 19.9 x .04 = 0.8 points lower *CGI*.

There is a strong negative correlation between firm risk (which predicts stronger governance) and firm profitability (which predicts weaker governance) (r = -0.48). This result is driven by small firms (see *Table 6*). Not surprisingly, the coefficient on firm risk (profitability) is stronger if we omit profitability (firm risk). If we remove firm risk from our base 4-digit regression, the coefficient on profitability nearly doubles to -34.10 (t = -4.28) (also compare the coefficients on profitability in *Table 4*, regressions (2) and (3)). However, we have no basis for preferring one variable over the other, so include both in our -regressions. The interaction between firm profitability and firm risk is a further example of the importance of omitted variable effects.

Ownership. In a simple picture of the relationship between ownership and governance, a controlling shareholder with a larger stake has less incentive to extract private benefits ("steal") from the firm, and therefore adopts better governance practices, which bond the promise not to steal and lower the cost of outside capital (Durnev and Kim, 2004). We find modest evidence of a correlation between ownership by the largest shareholder and *CGI*. The coefficient on ownership is significant, albeit barely so (t = 2.00) in our base 4-digit regression. This effect is driven by small firms (see *Table 6*). The effect is apparently nonlinear and becomes weaker as sole ownership increases, as reflected in the negative coefficient on ownership^2.

However, significance depends on which other control variables we use. The coefficient on ownership is insignificant in our basic 2-digit regression and is weaker and insignificant in regressions (not shown) without an ownership^2 term. Moreover, ownership is a significant predictor only for Ownership Parity Subindex. It is small and insignificant for the other subindices (see *Table 4*, regression (7) and *Table 5*, regression (5)). Ownership is also not robust in subsamples. It is significant for small but not large firms, for non-*chaebol* but not *chaebol* firms, and insignificant for small, non-*chaebol* firms (see *Table 6*).

To provide a sense of economic significance, a one standard deviation (14.4%) increase in ownership by the largest shareholder predicts a .127 x 14.4 = 1.83 point increase in *CGI* based on

the linear ownership term. However, for a firm that increases ownership by 14.4% starting from the median (mean) ownership of 15.94% (19.67%), this is offset by a 1.14 (1.32) point predicted decrease based on the ownership^2 term, for a net increase of only 0.5-0.7 points.

Durnev and Kim (2004) report similar results (positive coefficient on ownership; negative coefficient on ownership^2) for the *CLSA* index; but find no significant predictive effect of ownership for the S&P index. In the U.S., Gillan, Hartzell and Starks (2003) find that higher ownership by all directors and officers predicts a lower score on their board index, a higher score on their takeover-defense index, and a lower overall governance score; Gompers, Ishii and Metrick (2004) report that for dual-class companies, direct ownership of cash flow rights predicts .higher firm value, but ownership of voting rights without cash flow rights (analogous to ownership disparity) predicts lower value.

Chaebol dummy. Firms that belong to one of the top-30 *chaebol* groups are required by law to have major conflict-of-interest transactions approved by the board of directors. This should give them a higher score on governance element *A5* (part of Shareholder Rights Subindex), which asks whether the board approves related party transactions. C*haebol* firms may also be subject to greater public and regulatory pressure to improve their governance. Conversely, *chaebol* firms may have access to financing from other group members and hence face less investor pressure to improve their governance. A number of major *chaebol* groups also have reputations for poor governance. We therefore include a dummy variable for membership in the top-30 *chaebol*, with no prediction as to sign. This variable is a mixed regulatory and firm-level variable. In *Table 4*, the coefficient is small and insignificant in all regressions, with varying sign.

Firm risk. Riskier firms could need stronger governance. We therefore include a variable for 4-year average of the weekly standard deviation of stock price returns. We choose a long-term average both because we hypothesize that firms change their governance slowly in response to economic characteristics and because short-period averages of share price variation are noisy measures of underlying risk. This variable is highly significant and positive. A one standard deviation (.03) change in firm risk predicts a 70 x 0.03 = 2.1 point increase in *CGI*. [11]

In separate regressions (not shown), we use the market model to separate firm risk into systematic and firm-specific components. In these regressions, firm specific risk is positive and significant, systematic risk is positive but insignificant, the difference between the coefficients on systematic and firm-specific risk is insignificant, and the overall predictive value of the regression is not significantly improved. Firm-specific risk and total firm risk are highly

[11] Durnev and Kim (2003) and Klapper and Love (2003) do not investigate firm risk. Gillan, Hartzell and Starks (2003) report that firm volatility predicts stronger governance of U.S. firms.

correlated (r = 0.96). We also have no theoretical reason to expect systematic and firm-specific risk to have different effects on firms' governance choices. We therefore report only results for total firm risk.

We conduct a number of additional robustness checks on firm risk (results not shown). First, we vary the averaging period used to estimate firm risk. Increasing the averaging period increases the significance of firm risk up to 4 years. Further increases in the averaging period have little effect on significance. This could reflect the noisiness of short-term estimates of firm risk. Second, we get similar results using daily and weekly standard deviations as measures of firm risk. Third, future realized risk could proxy for expected risk at the 2001 date when we measure corporate governance. If firms adapt their governance to expected risk, this could improve the power of the firm risk variable. However, including 2002 in the period over which we compute risk does not significantly affect the predictive power of the risk variable. By itself, 2002 risk has an insignificant *negative* coefficient. Fourth, large firms are also less risky -- the correlation between ln(assets) and firm risk is r = -0.19. We therefore experiment with removing ln(assets) from our base 4-digit regression (regression not shown). The coefficient on firm risk drops from 64 to 41 but remains significant.

Leverage. One can tell different stories for how leverage might affect corporate governance. Firms with a high proportion of debt in their capital structure are likely to be subject to stronger monitoring by creditors, so could evolve weaker governance (a *substitution* story). Firms with greater access to debt capital (proxied by leverage) may care less about raising equity capital, and thus have weaker governance. In a *reverse causation* story, worse-governed firms could have a tougher time raising eqyuity capital, and thus rely more on debt. Alternatively, creditors could offer better terms to firms with improved governance (an *investor pressure* story; see Bhojraj and Sengupta, 2003). Since most of these stories predict a negative relationship between leverage and governance, we have a mild prediction of a negative coefficient on leverage. We measure leverage as ln(debt/market value of common equity), winsorized at 1% and 99%. We use the logarithmic transformation and winsorizing to reduce the effect of outlier observations with high debt and low market equity.[12]

Leverage is negative and significant in our base 4-digit regression, consistent with a substitution effect. A change from the minimim value to the median value predicts a -0.92 x 0.82 = -0.8 point decrease in *CGI*. This result is driven by large firms and *chaebol* firms (see *Table 6*).

[12] Before logarithmic transformation, debt/market value of common equity is highly skewed to the right, because a limited number of firms have very high debt/market equity ratios. The median is 2.42, while mean is 6.22, standard deviation is 11.83, and maximum is 68.02.

As robustness checks (regressions not shown), we consider various alternate specifications of a leverage variable: debt/market value of total equity, debt/market value of assets, debt/book value of common equity (dropping 6 firms with negative book value of common stock), debt/book value of total equity, and debt/book value of assets. For variables with book or market equity in the denominator, we compute logarithms and winsorize at 1% and 99% to reduce the influence of outlier firms. These alternate specifications are significant and negative for debt/market value of total equity and debt/market value of assets. Variants with book value in the denominator are generally insignificant, sometimes with varying sign.

Market share. In equilibrium, firms with high market share could evolve weaker governance because they face less market pressure towards efficiency (a *market pressure effect*) or stronger governance to compensate for weaker product market constraints (a *substitution effect*). We therefore include a market share variable, with no prediction as to sign. We find mild support for a substitution effect. Market share is positive but insignificant in *Table 4*, turns marginally significant in regressions that substitute equity finance need for sales growth and profitability (see *Table 8*), but changes sign for large firms which are the firms most likely to have dominant market shares (see *Table 6*). In our base 4-digit regression, a one-standard deviation (0.13) increase in market share predicts an 8.2 x 0.13 = 1.1 point increase in *CGI*.[13]

Firm age. If firms change their governance slowly over time, older firms could have worse governance, because they went public at a time when Korean governance standards were lower than today (a *path dependence* story). On the other hand, these firms have had more time to improve their governance in response to investor pressure. We therefore include ln(years listed) as a measure of firm age, with no prediction as to sign. This variable is positive but insignificant and economically small. A one standard deviation (9.28 years) increase in years listed predicts a ln(9.28) x 0.36 = 0.8 point increase in *CGI*.

Exports/sales. Korean government policy has traditionally favored export-oriented industries, although less so after the 1997-1998 financial crisis. Thus, these firms could face weaker investor pressure for strong governance. These firms may also face stronger product market competition, which could either create pressure for improved governance or substitute for internal governance. We therefore include an exports/sales variable, with no prediction as to sign. This variable is positive and marginally significant in some 2-digit specifications, but it takes a small, insignificant coefficient in our base 4-digit regression. This suggests that any

[13] In separate regressions (not reported), we include the Herfindahl-Hirschman index as a measure of 4-digit market concentration in regressions . This variable is only available with 2-digit industries because it is a linear combination of the 4-digit industry dummies. Market concentration might affect corporate governance for the same reasons (substitution and market pressure effects) as market share. This variable is insignificant and close to zero.

effect is largely captured by the industry dummy variables. A one-standard deviation (0.30) increase in exports/sales predicts a tiny 0.30 x 0.20 = 0.06 change in *CGI*.

Capex/sales. Capital expenditures can proxy for growth opportunities (implying a positive coefficient). They can also proxy for the capital intensity of a firm's business. Firms with greater reliance on tangible assets may be easier for investors to monitor directly, hence could evolve weaker governance (a substitution effect, similar to the effect we find for leverage). Alternatively, firms with more tangible assets could evolve stronger governance *because* they are easier to monitor (a complementarity between ease and intensity of monitoring). We therefore include a capital expenditures (capex)/sales variable, with no sign prediction. This variable is positive but insignificant and economically small. A one-standard deviation (0.09) increase in capex/sales predicts a 0.09 x 3.72 = 0.4 point increase in *CGI*.

Tangible (intangible) asset intensity (R&D/sales; advertising/sales, PPE/sales). As we discuss above for capex/sales, firms with greater reliance on tangible (intangible) assets may be easier (harder) for investors to monitor. This could affect their governance, through either substitution or complementarity effects. We therefore include control variables for *R&D*/sales and advertising/sales as measures of intangible asset intensity (these variables can also proxy for growth opportunity). We include *PPE*/sales as a measure of tangible asset intensity. We have no sign prediction for these variables.

We get opposite signs for *R&D*/sales and advertising/sales; both of which are insignificant and economically small. The substitution story for tangible assets is mildly supported. *PPE*/sales is negative and marginally significant in our base 4-digit regression, but is economically small. A one-standard deviation (0.48) increase in *PPE*/sales predicts a 1.07 x 0.48 = 0.5 point decrease in *CGI*. Moreover, the coefficient is insignificant in all subsamples (see *Table 6*) and drops from -1.07 to -0.20 (t = -0.30) if we switch from ln(assets) to ln(sales) as a size control.[14] *PPE*/sales strengthens and becomes significant in *Table 8*, where we combine sales growth and firm profitability into a single measure of equity finance need, but is again insignificant if we switch from *CGI* to *CGI* - Parity as a dependent variable (*Table 8, regression (6)*). Our mixed results for *PPE*/sales and other asset tangibility variables contrast to Klapper and Love (2003), who report that *PPE*/sales predicts lower firm score on the *CLSA* governance index.

Ownership parity. Divergence between control rights and cash flow rights increases the controlling shareholder's incentive to steal, so low divergence (high ownership parity) should predict better corporate governance. We investigate the effect of ownership parity in *Table 4,*

[14] The correlation between ln(sales) and PPE/sales is significant but modest, at r = -0.11. A more likely driver of the interaction between size and PPE/sales is the 0.52 correlation between assets and *PPE*.

regression (7). In this regressions, we remove ownership parity from *CGI*, treat ownership parity as an independent variable, and treat *CGI* - Ownership Parity Subindex (which we call *CGI - Parity*) as the dependent variable. Ownership Parity Subindex is positive and significant as a predictor of *CGI* - Parity. However, the economic effect is modest. A one standard deviation (2.80) increase in Ownership Parity predicts a 2.8 x 0.35 = 1.0 point increase in *CGI* - Parity.[15] At the same time, statistical significance disappears for all firm-level variables except ln(assets) and leverage. This underscores the overall weakness of firm-level variables in predicting firms' governance choices.

Foreign ownership. Foreign shareholders could pressure managers to improve firm governance, or could be attracted to firms with already strong governance. We consider but do not use a variable for foreign ownership as a fraction of shares outstanding because of the risk of reverse causation, in which governance predicts foreign ownership, rather than (or in addition to) foreign ownership predicting governance. If included, foreign ownership takes a coefficient between 6 and 8 (depending on which other control variables we use), is typically marginally significant and is sometimes significant. A one standard deviation (0.13) increase in foreign ownership predicts a 0.8-1.0 point increase in *CGI*.[16]

To assess the likelihood of reverse causation, we also run regressions (not reported) using a dummy variable for membership in the Morgan Stanley Capital International Index, the principal international index covering Korean firms. *MSCI* dummy correlates strongly with foreign ownership (r = 0.45). If causation runs primarily from foreign ownership to *CGI*, then in a regression which includes *MSCI* dummy but not foreign ownership, *MSCI* dummy should pick up some of the effect of foreign ownership and should be positive. However, a firm's governance choices likely do not affect its inclusion in the *MSCI* index. Thus, if causation runs primarily from *CGI* to foreign ownership, *MSCI* dummy will be small and insignificant. This is the result we find, both in *OLS* and in two-stage least squares regressions where we use *MSCI* dummy as an instrument for foreign ownership. This is consistent with reverse causation.

ADR dummy variables. Six firms in our sample are cross-listed on U.S. exchanges with level 2 or 3 American Depository Receipts (*ADR*s), and thus must comply with the foreign exchange's listing requirements. Three of these six firms are *SOE*s. Firms with level 2/3 *ADR*s may improve their governance in order to qualify for listing. On the other hand, foreign

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[15] Compare the weaker results in Durnev and Kim (2003) for their similar "wedge" variable. The differences may arise because Durnev and Kim have ownership disparity data for only a fraction of their sample, or because they use a 0-1 dummy variable as a measure of ownership parity, while we use a continuous measure.

[16] Compare Klapper, Laeven and Love (2003), who find only mild evidence that a dummy variable for whether a foreigner is one of the firm's five largest shareholders predicts greater adoption of cumulative voting or voting by mail.

listing can be seen as an element of governance. We exclude this variable due to due to overlap with *SOE* dummy and uncertainty about whether these *ADR*s are better understood as an element of a governance index or as a factor that predicts governance. If included, an *ADR* (Level 2/3) dummy variable is generally marginally significant and takes a coefficient of about 8. At the same time, the coefficient on *SOE* dummy drops from 7.6 to 4.5.[17]

E. Results for Subindices and Reduced Indices

Table 5 presents results for each of our five subindices, and for the corresponding reduced indices (*CGI* - one subindex). Many of the results are sensible, but a few are puzzling. Below, we highlight selected results for particular independent variables, subindices, and reduced indices.

1. Results for Independent Variables

Asset size dummy. Asset size dummy is a powerful predictor of Board Structure Subindex. This is expected because Board Structure Subindex contains the governance elements that are directly affected by legal rules that apply to large firms. Asset size dummy is positive for all other subindices but significant only for Board Procedure Subindex. This too is sensible: firms that are required by law to change their board structure are likely to improve their procedures as well.

Bank dummy. This is the only variable that is significant for each of the five subindices. Banks, partly due to legal rules, do a good job of corporate governance across the board.

SOE dummy. The special rules that apply to *SOE*s largely affect board procedures. Consistent with this, *SOE* dummy predicts significantly higher score on Board Procedure Subindex and is positive but insignificant for other subindices.

Firm size. Larger firms have stronger board procedures and stronger disclosure. The coefficients on ln(assets) remain positive for the other subindices, but are not significant. This is a bit of a surprise. We had expected larger firms to be better governed across the board. In particular, one might expect larger firms to have lower direct and indirect ownership by the largest shareholder, and hence higher ownership parity. In fact, the correlation coefficient between ln(assets) and sole ownership (ownership parity) is insignificant and small at $r = 0.01$ (0.02).

Sales growth. Sales growth produces a surprise. Faster growing firms have *worse* disclosure. We have no explanation for this result. It could simply reflect noise. Our

[17] Ten additional firms in our sample trade on foreign exchanges through level 1 ADRs. Level 1 *ADR*s do not require compliance with foreign disclosure or other governance rules. If included in the regressions in *Table 4*, an *ADR* (Level 1) dummyvariable is small and insignificant coefficient.

disclosure index is thin, because the KSE asked few disclosure questions (*Table 1* discusses the components of this subindex). Yet in our governance-to-value work (Black, Jang and Kim, 2004), Disclosure Subindex, despite its thinness, was a significant predictor of higher Tobin's *q*.

This odd result sharpens the tension between our results for growth and those in Durnev and Kim(2004), who find that 2-year sales growth predicts higher score on both the *S&P* disclosure index and the broader *CLSA* index. At the same time, sales growth is significant and positive for the *CGI* - Disclosure reduced index. This suggests that sales growth might be significant for *CGI* as a whole if we had a stronger disclosure subindex.

Profitability. Profitability (net income/assets) correlates significantly and negatively only with Shareholder Rights Subindex and Ownership Parity Subindex. The latter result is surprising. Assume, for example, that a firm's largest shareholder wants to retain a minimum overall voting stake, but can adjust its direct and indirect ownership levels. One would expect the shareholder to choose higher *direct* ownership (and hence higher ownership parity) for a more profitable firm. Or, in a reverse causation story, the shareholder could arrange intra-group transactions that transfer profits to firms in which the shareholder has high direct ownership. Both stories imply that higher profitability should predict higher ownership parity, which is not what we observe.

Ownership. Ownership is a significant predictor of Ownership Parity Subindex. It is small and insignificant for all other subindices, as well as the *CGI-Parity* reduced index. This may be a mathematical effect as much as a governance choice: firms with high ownership by the largest shareholder have fewer shares owned by anyone else, and hence higher ownership parity.

Chaebol dummy. Consistent with the popular perception of *chaebol* firms, they have lower ownership parity than other firms. Ownership Parity Subindex runs from 0-20. Thus, the -0.89 coefficient on *chaebol* dummy implies that ownership parity is roughly 5 x 0.89 = 4.5% lower for chaebol than for nonchaebol firms. *Chaebol* membership has no significant predictive effect for other subindices.

Firm risk. Firm risk is positive and significant or marginally significant for all subindices except Shareholder Rights (where is it negative and insignificant). Firm risk is especially powerful for Ownership Parity Subindex. This is puzzling. Assume, for example, that a firm's largest shareholder wants to retain a minimum overall voting stake, but can adjust its direct and indirect ownership levels. One would expect the shareholder to choose lower direct ownership for a risky firm, rather than lower indirect ownership. Yet we find the opposite result.

Leverage. Firm leverage, measured as debt/market value of common equity, winsorized at 99%, is negative and significant for Disclosure Subindex, but insignificant for other subindices. It is not apparent why a substitution story (higher leverage implies stronger creditor monitoring and hence less need for other governance measures) should be powerful for disclosure but not

other governance elements. The reverse causation story (poorly governed firms rely more on debt because they have less access to equity capital) better fits the negative relationship between leverage and disclosure.

Firm age. Firm age, proxied by ln(years listed) is insignificant as a predictor of overall *CGI*, but is significant and positive as a predictor of Board Procedure Subindex. This makes some sense -- older firms have had more time to develop strong board procedures.

Other variables. the remaining variables are insignificant as predictors of *CGI*. The two instances in which they significantly predict subindices (negative coefficients on R&D/sales for Shareholder Rights Subindex and on Exports/Sales for Disclosure Subindex), have *t*-statistics barely over 2, are not robust to choice of other control variables, and may be false positives.

2. Robustness Across Reduced Indices

An important robustness check for our results with *CGI* as dependent variable is to see whether these results change if we substitute one or another reduced index for *CGI*. *Table 5,* regressions (6-10), shows the results for reduced indices. The strongly robust results are for asset size dummy, bank dummy, and ln(assets), which are significant for *CGI* and each reduced index.[18]

Several other variables are reasonably robust. Firm risk is significant for all reduced subindices except *CGI* - Parity, is marginally significant for *CGI* - Parity, but loses significance for *CGI* - Parity if we add Ownership Parity as an additional independent variable (see *Table 4*, regression (7)). Profitability is significant for reduced indices that include the two subindices for which it is a significant predictor (Shareholder Rights and Ownership Parity), and marginally significant for *CGI* - Parity, although insignificant if we add Ownership Parity as an additional independent variable (*Table 4*, regression (7)). Leverage is significant for all reduced indices except *CGI* - Disclosure. Ownership is significant or marginally significant for all reduced indices except *CGI* - Parity. However, this merely reflects the subindex regressions, in which ownership predicts higher Ownership Parity but is insignificant for other subindices.

In robustness checks we replace sales growth and firm profitability with a equity finance need and obtain similar results. In further robustness checks, we include the omitted subindex as an additional control variable. We show two of these regressions, with

[18] In robustness checks (regressions not shown) with reduced indices as dependent variables, we obtain similar results in regressions that replace sales growth and firm profitability with a combined equity finance need measure (*EFN*). We discuss our *EFN* regressions in *Part V.C.* In these regressions, bank dummy and ln(assets) are significant for all reduced indices; asset size dummy is significant for all reduced indices except - Board Structure (for this reduced index, it is positive and marginally significant, with $t = 1.79$); and firm risk is significant for all reduced indices except *CGI* - Parity (it is positive for this reduced index, with $t = 1.56$).

CGI - Disclosure and *CGI* - Parity as dependent variables, in *Table 4*, regressions (6-7). Results are generally similar (compare *Table 4*, regressions (6-7) to *Table 5*, regression (9-10)).

F. Results for Subsamples

In Table 6, we consider results for the following subsamples:

- small firms versus large firms
- non-*chaebol* firms versus *chaebol* firms
- small non-*chaebol* firms

We explain below our principal results.

1. Small versus Large Firms

We first assess whether there are differences between large firms, which are subject to special governance rules, and small firms, which are not subject to these rules. For the large firm regression, we switch to 2-digit industry dummies to preserve degrees of freedom. A number of distinctions emerge. First, the overall ability of the regression to predict governance is much higher for large firms than for small firms. *A*djusted R^2 is 0.5031 for large firms, despite cruder industry controls, versus 0.2134 for small firms. This is consistent with large firms doing more to tailor their governance to their environment, while small firms are more likely to make idiosyncratic governance choices. At the same time, only two firm-level variables are significant for large firms: *ln*(assets) and leverage.[19]

The greater predictive power of the large firm regression was not obvious *ex ante*. A competing hypothesis would be that the rules governing large firms force these firms to be better governed than they would choose to be -- out of equilibrium, as it were. If so, these firms' governance choices might be less responsive to economic factors than small firms' choices. Large firms also have fewer choices to make, because several important choices have been made for them. Thus, economically driven variation could be suppressed by regulation.

Although the coefficients are insignificant, the sign flips on sales growth and profitability (and thus also, in *Table 6B*, on equity finance need). Here is a story that could explain both this sign change and the strong negative relationship between leverage and governance for large (but not small) firms. Larger Korean firms could have access to capital, especially debt capital, regardless of their governance (which can't be too bad overall, given the floor set by legal rules).

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[19] For large firms, *chaebol* dummy is negative, economically important at -9.8, and almost significant (t = -1.98). However this result is not robust; the large coefficient and large standard error may reflect the large number (25) of independent variables we use in the large firm regression, with a sample size of only 63. If we combine large firms with the next largest 1/4 of "small" firms, the coefficient on *chaebol* dummy again becomes small and insignificant.

This may also be true of *chaebol* firms, which have access to intragroup financing. Worse governed large firms may raise more debt capital, rather than changing their governance to attract equity capital. In contrast, small firms, especially small, non-*chaebol* firms, have limited access to debt capital, and thus greater need to change governance to attract equity capital.

2. Non-chaebol versus Chaebol Firms

Chaebol and non-chaebol firms differ primarily in the significance of leverage and ownership. Leverage is significant and negative for large firms and for *chaebol* firms, but insignificant for small firms and non-*chaebol* firms. We have no ready explanation for these results. Both large firms and *chaebol* firms tend to be more highlyleveraged (r = 0.43 between ln(assets) and leverage, r = 0.15 between *chaebol* dummy and leverage). But it is not obvious why there should be apparent substitution between leverage (and thus potentially greater creditor oversight) and *CGI* (which may influence other forms of oversight) only for these firms.

Turning to ownership, it is not obvious why ownership by the largest shareholder should predict stronger governance only for non-*chaebol* firms. In any case, the significance of ownership disappears if we require the non-*chaebol* firms to be small (*Table 6*, regression (5)).

V. Further Investigation of Selected Firm-Level Variables

We investigate more carefully in this part the predictive value of three related firm-level variables: growth, profitability, and equity finance need (a variable that combines growth and profitability). We investigate these variables with greater care because they plausibly predict better governance, and because our weak results for sales growth contrast with the stronger results found in Durnev and Kim (2004) and Klapper and Love (2003).

A. Firm Growth and Growth Opportunity

We consider more carefully in this section the association between growth opportunity, proxied by past sales growth, and *CGI*. In the regressions discussed in Part IV, we use a long, 8-year averaging period for sales growth. We have two reasons for this choice. First, we expect that firms usually change their governance gradually over time. Thus, sustained growth over several years (reflecting sustained growth opportunities) may predict *CGI* better than short-term growth. Second, the longer period allows us to proxy for growth opportunities over a full economic cycle, including both the 1997-1998 financial crisis and the subsequent recover. Still, these are not strong priors. A long averaging period can overweight the remote past, at the expense of the more-relevant recent past.

We address these possibilities in *Table 7*. Line (1) of *Table 7A* (*Table 7B*) reports coefficients for sales growth and profitability from regressions similar to our basic 2-digit (4-

digit) regressions, with various averaging periods from 2-11 years. In robustness checks (not reported) we obtain similar results using asset growth instead of sales growth.

Sales growth is stronger with 2-digit industry dummies, as we saw in *Table 4*. But the significance of past growth is sensitive to the averaging period. Sales growth is small and insignificant for averaging periods of 4 years or less. It becomes marginally significant for 5-year average, significant for 6-8 year averages, but declines in importance for longer periods. This sensitivity to averaging period strengthens our doubts about whether growth is a reliable predictor of governance. With 4-digit industries, the coefficient on sales growth is *negative* for periods from 2-5 years.

Future growth. Future growth during 2001-2002 provides a different proxy than past growth for growth opportunities at the early 2001 date of our study. Surprisingly, the correlation between past and future growth is *negative*. For example, we get a significant -0.16 correlation between future growth and 8-year past growth. We therefore investigate in separate regressions (not shown) whether future growth predicts current governance. Geometric average future sales growth for 2001-2002 takes a significant positive 2.32 coefficient (t = 2.07) with 4-digit industries, but is insignificant with 2-digit industries. We find similar results for future asset growth, and similar results with or without controlling for past growth. A one standard deviation (2.38) change in future growth predicts a large 2.38 x 2.32 = 5.5 point increase in current governance. **[further discussion of future growth, and possible inclusion in main regressions to come after further work with 3-year future growth We do not include future sales growth in our basic 2-digit and 4-digit regressions because of a combination of nonrobustness and causality concerns (current governance may predict future growth, rather than vice versa)]**.

B. Profitability

We conduct a variety of robustness checks with alternate measures of profitability (*Table 7B*). We get similar results if we use net income/sales instead of net income/assets (regrerssions not shown). If we switch from net income/assets to ordinary income (basically income before taxes and extraordinary items, but after interest payments)/assets, our results weaken slightly (compare line (1) to line (2) in *Table 7B*).. *EBIT*/assets takes a small and insignificant coefficient regardless of averaging period, as does *EBIT*/sales. Our results for profitability are somewhat sensitive to the choice of other control variables. For example, the coefficient drops from roughly 18 to 14 and becomes only marginally significant (t = 1.87) if we use debt/assets as our leverage control.

Sales growth and profitability both affect a firm's need for outside capital, in opposite ways, yet correlate fairly strongly (r = 0.26). This raises the possibility of interaction effects between

these two variables. To explore these effects, line (5) (line (6)) of *Table 7B* reports coefficients on sales growth (profitability) from regression that include all control variables except profitability (sales growth), for different averaging periods. The negative correlation between firm profitability and *CGI* is not greatly affected by removing sales growth from the regression. Removing profitability, however, further weakens the connection between sales growth and *CGI*. The coefficients are smaller and more often negative.

C. Equity Finance Need and External Finance Need

1. Equity Finance Need

Our results above for profitability, and to a lesser extent, for growth, are consistent with firms that need more capital choosing moderately better governance. One can also combine growth and profitability into a single measure of the need for equity finance. We use a measure of equity finance need rather than a measure of total external finance need because equity investors are likely more sensitive to a firm's governance.[20]

An advantage of this approach is that by combining two related variables (growth and profitability) we may find a stronger effect than for either alone. A weakness is that this approach assumes that profitability affects governance only indirectly, by affecting equity finance need. Profitability may also affect governance because firms with weak profitability may choose (or be pressured by investors to choose) better governance to improve their performance.

We adapt a measure of equity finance need adapted from Demirguc-Kunt and Maksimovic (1998). Durnev and Kim (2004) report that a similar measure of equity finance need predicts higher scores on the *CLSA* governance index and the *S&P* disclosure index. To develop this measure, we:

- use historical asset growth rate to proxy for the growth that the firm must finance
- assume that the firm maintains a constant ratio of debt/book value of assets
- assume constant profitability (measured by net income/start-of-year book equity, which we call *return on trailing equity (RotrE)*, to distinguish it from conventional return on equity (*ROE*), which is measured as net income/end-of-year book equity)[21]
- assume zero dividends (most Korean firms in fact pay low dividends).

Under these assumptions, a firm will need equity finance if its growth rate exceeds its return on

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[20] In separate regressions (not reported) we include separate variables for equity finance need and debt finance need, and find that debt finance need has no significant correlation with *CGI*.

[21] For a firm that does not raise equity during the year, the two are related by: $RotrE = ROE/(1 - ROE)$. Note that return on trailing equity cannot be computed for firms with negative book value of equity. **[Six, confirm number]** firms in our sample have negative book value of equity at year-end 1999.

trailing equity, but can finance growth with retained earnings and debt if its growth rate is slower than this (zero need for equity finance). Remembering that book values are measured at the end of year *t*, while net income and other flows are measured for year *t*, using 8-year geometric average growth rate as our measure of asset growth rate g_{asset} and 8-year arithmetic average *RotrE* as our measure of profitability,[22] we determine a raw measure of equity finance need (EFN_{raw}) as:

$$g_{asset} = (assets_{2000}/assets_{1992})^{1/8} - 1$$

$$RotrE = [\text{net income}_{2000}/\text{book equity}_{1999} + \text{net income}_{1999}/\text{book equity}_{1998} + \ldots + \text{net income}_{1993}/\text{book equity}_{1992}] / 8$$

$$EFN_{raw} = \max \{0, g_{asset} - RotrE\}$$ [23]

We suppress large positive values of EFN_{raw} (above 0.5) to 0.5 on the grounds that firms face practical constraints on the speed with which they can raise external capital. Firms with large positive values of EFN_{raw} are likely to face these practical constraints and thus may behave similarly in their corporate governance choices. 22 of the 513 firms for which we can compute EFN_{raw} have values of EFN_{raw} greater than 0.5. Of these, 21 have high need for equity finance because they are losing money ($RotrE < 0$). It seems unlikely that equity markets will be receptive to large equity offerings by these firms. We discuss below robustness checks with different upper bounds on *EFN*. We label this variable, with negative values truncated at zero by definition of EFN_{raw} and large positive values truncated at 0.5, as *EFN*.

Table 8 reports regressions similar to *Table 4*, except substituting 8-year *EFN* for both 8-year sales growth and 8-year profitability. *EFN* is positive and significant in all regressions. As expected given the results in *Table 4* for its component parts, sales growth and profitability, *EFN* weakens as we add control variables and switch from 2-digit to 4-digit industries. However, economic significance is modest. In *Table 8, regression (5)* (call this our *base EFN regression*), a one standard deviation (0.13) increase in *EFN* predicts a 0.13 x 8.59 = 1.1 increase in *CGI*.

2. Robustness Checks

We conduct a variety of robustness checks on our results for *EFN*. We obtain similar results if we substitute asset growth for sales growth. For comparability to Durnev and Kim (2004), we consider regressions with both sales growth and *EFN* as separate variables

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[22] In computing multi-year averages of *RotrE*, we drop firm-years with negative book value of total equity because one cannot sensibly compute *RotrE* for those firm-years.

[23] 106 firms in our sample have 0 values of EFN_{raw}. Durnev and Kim (2003) use a similar measure of equity finance need, except that they use two-year averages and allow equity finance need to be negative. We think it more natural to assume that firms that do not need for equity capital will behave similarly -- they face little pressure to raise capital and are unlikely to change their corporate governance to facilitate raising capital.

(regressions not shown). The coefficient and *t*-statistic on *EFN* are almost unchanged, and sales growth takes an insignificant negative coefficient. Again for comparability to Durnev and Kim, we remove ownership parity from *CGI* and treat it as an independent variable (*Table 8, regression (6)*). *EFN* weakens and becomes only marginally significant.

We compute, but do not show, regressions similar to our base *EFN* regression, except with subindices and reduced indices as dependent variables. *EFN* is significant and positive for the same subindices (Shareholder Rights and Ownership Parity) as profitability (compare *Table 5*) and is significant or marginally significant for all reduced indices.

In *Table 9*, we assess the sensitivity of our results to different averaging periods for *EFN* and different definitions of *EFN*. In line (1), we see again the importance of long averaging periods. *EFN* is significant only for averaging periods of 7 years or more. Our choice to truncate large positive values of *EFN* at 0.5, rather than some other level, was arbitrary. This upper bound is equivalent to winsorizing at about the 96% level. We get similar but slightly weaker results if we instead winsorize large positive values at the 99% level (which produces winsorizing at an EFN_{raw} level of roughly 0.80) (*Table 9*, line (2)), or if we do not winsorize at all (regressions not shown).

Our definition of *EFN* treats similarly all firms that do not need equity financing to fund their growth, regardless of how much cash flow they generate above the level needed to fund growth. In contrast, Durnev and Kim (2004) use a measure of equity finance need variable that they allow to take both negative and large positive values. In Table 9, line (3), we show results for a similar variable EFN_{full}:

$$EFN_{full} = g_{asset} - RotrE$$

The coefficient on EFN_{full} is negative and insignificant. This confirms our judgment to treat similarly all firms that can finance growth with a combination of internal funds and debt finance. Table 9 also shows the distribution of firms with different values of EFN_{full}.

The results for EFN_{full} sharpen the differences between our results for equity finance need and those in Durnev and Kim. On the surface, we obtain similar results for a similar variable. Yet if we -- (i) make our governance index more parallel to theirs by removing ownership parity from the index and making it an independent variable; or (ii) allow (as they do) both negative and large positive values of equity finance need; or (iii) use the same 2-year averaging period they use -- in *each case* significance disappears, and the sign of the coefficient on equity finance need is not stable.

3. Results for Subsamples

We compute regressions similar to *Table 8* for subsamples (small versus large firms; non-*chaebol* versus *chaebol* firms; and small non-*chaebol* firms), and show the results for EFN in

Table 6B. *EFN* is a strong predictor of governance for small firms, but flips sign and becomes insignificant for large firms. *EFN* is also a strong predictor of governance for non-*chaebol* firms but is near zero and insignificant for *chaebol* firms.

A story consistent with these results is that large firms have access to capital, regardless of governance. These firms can't be terribly governed, due to legal rules. As noted above, the worse-governed large firms tilt towards debt capital. *Chaebol* firms also have access to capital, perhaps because of intragroup financing. The remaining small, non-*chaebol* firms face, and respond to, market pressure to improve their governance if they want to tap equity capital markets. Still, even for these firms, the effect of equity finance need on governance is modest. For small, non-*chaebol* firms, a one-standard deviation change in EFN predicts an **[0.13; update for actual std dev for these firms]** x 12.4 = 1.6 point increase in *CGI*.

4. Outcome-Based Measure of Equity Finance Need

EFN is only one possible proxy for equity finance need. An alternative measure, developed by Rajan and Zingales (1998), and employed as a measure of equity finance need by Baker, Stein and Wurgler (2003), focuses on actual capital raised relative to need for capital. They estimate external finance need as (capex-*EBIT*)/capex. By analogy, we estimate an outcome-based measure of equity finance need as:

$$EFN_{\text{outcome}} = \max \{0, (\text{equity capital raised})/\text{capex}\}$$

We estimate equity capital raised as change in (book value of equity - retained earnings). Rajan and Zingales study only manufacturing firms. For financial firms, capex is not a good measure of net investment. For these firms, we therefore replace capex with capex plus net investment in financial assets.

Table 9, line (4) shows our results for EFN_{outcome}, winsorized at 99%.. The correlation between *EFN* and EFN_{outcome} is surprisingly modest at $r = 0.11$. Unexpectedly, EFN_{outcome} is negative and either significant or marginally significant for all averaging periods and marginally significant for longer periods. In robustness checks (not shown), we obtain similar results for EFN_{outcome} for a subsample of nonfinancial firms, for which we can use a standard measure of capex in the denominator of EFN_{outcome}, if we do not winsorize EFN_{outcome}, and for an alternative variable $EFN_{\text{outcome-full}}$ that can take both negative and positive values:

$$EFN_{\text{outcome-full}} = \text{change in (book value of equity - retained earnings)}$$

If we substitute assets for capex in the denominator of EFN_{outcome}, the coefficients are insignificant for all averaging periods, negative for 2-5 year periods, and positive for longer periods. Taking these results as a whole, we have no reason to prefer the Rajan-Zingales-derived EFN_{outcome} measure to the Demirguc-Kunt derived *EFN* measure. However, the

negative coefficient on $EFN_{outcome}$ strengthens our doubts about whether equity finance need is a robust predictor of improved corporate governance.

5. External Finance Need

We also investigate whether total external finance need predicts better corporate governance. By analogy to our definition of *equity* finance need, we define *external* finance need as:

$$EXFN_{raw} = \max \{0, (g_{asset} - \text{return on trailing assets } (RotrA))\}$$

In regressions that substitute *EXFN* for *EFN*, external finance need is insignificant for all time periods and remains insignificant for variants of *EXFN* similar to the variants of *EFN* explored in *Table 9*.

In a regression that includes both *EFN* and *EXFN*, external finance need can be understood as the need for debt finance. In regressions that use both variables, both are insignificant, perhaps due to colinearity (r = 0.52 for 8-year averages of both variables). Thus, there is no evidence that Korean firms change their corporate governance in order to raise debt capital.

VI. Industry Factors

A. Industry Dummy Variables

We have seen in *Tables 4 and 8* that moving from 2-digit to 4-digit industry dummy variables has a substantial effect on the coefficient on other independent variables, in particular sales growth. We therefore reproduce in *Table 11* the coefficients on each 4-digit and 2-digit industry dummy variable, omitting industries that include only one firm, for which we cannot separate industry and firm effects.

All industry coefficients are insignificant. Nonetheless, we can see that the numerical size of the coefficients is much larger for 4-digit industries, ranging from +9.2 to - 5.8. This compares to a range for 2-digit industries of +3.1 to -2.3. The highest positive coefficient is for financial institutions, including banks. This result is driven by banks; other financial institutions have a industry dummy coefficient near zero.

The other observable pattern is that many (thought not all) of the high-scoring industries are relatively new, while older, likely mature industries cluster near the bottom of *Table 10A*, including manufacture of other transport equipment, fishing; manufacture of coke, refined petroleum products and nuclear fuel, manufacture of wood and products of wook, manfacture of articles of straw, and water transport. This explains why the coefficient on sales growth weakens when we switch from 2-digit to 4-digit industries. This effect is washed away with 2-digit industries, because the huge "manufacturing" industry, comprising 363 of the 517 firms in the sample, includes a mix of low-scoring and high-scoring industries. Unfortunately, there is not obvious way to determine whether the stronger results for sales growth with 2-digit industries,

or the weaker results with 4-digit industries, are the "right" ones. This depends on why the low-scoring industries score low -- because they are slow growing, or for some other reason? Our own judgment is to be uncomfortable with results based on crude 2-digit industries, in part because they lump 70% of our sample into "manufacturing."

Recall with 4-digit industry dummies, the predicted effect of all economic variables except firm size is modest -- the predicted change in *CGI* has a standard deviation of only around 2.5. Whatever the cause of the variation across industries, we can see that it is comparable to the combined effect of all economic variables other than firm size. If we treat each industry as a single observation, the standard deviation of the 4-digit (2-digit) industry coefficients reported in Table 11 is 3.13 points (1.77 points).

B. Industry Growth, Profitability, and Equity Finance Need

To investigate whether our use of 4-digit industry dummies is suppressing a possible relationship between economic variables, especially firm growth, and CGI, we switch in *Table 11* to a 2-digit framework, and investigate consider industry average growth, profitability, or *EFN*, significantly predicts *CGI*.

[discussion to come of industry effects, robustness check using 4-digit industry dummies and 2-digit industry growth, profitability, and EFN]

C. Averaging Period for Industry Growth, Profitability, and Equity Finance Need

[discussion to come of Table 12]

D. Other Industry Variables

[discussion to come of Table 13]

VII. Conclusion; Avenues for Future Research

[conclusion to come]

A natural question, given the limitations of the cross-sectional approach used in this study (and in Durnev and Kim and Klapper and Love), is what we might learn from a time-series approach. In joint work with Kyungsuh Park, we are using the responses to the ongoing annual corporate governance surveys by the Korea Stock Exchange that began in 2001. We expect to build a 4-year corporate governance index, covering 2001-2004, that will allow us to begin to address this question (Black, Jang, Kim and Park, in process).[24]

A further question is to what extent are our results specific to Korea. The most direct way

[24] Unfortunately, the Korea Stock Exchange has substantially changed the survey over this time period, which limits the governance elements that we can use to construct a governance index that is consistent over time.

to address this question is through similar studies in other major emerging markets. One of us is in the planning stages for in-depth studies in Brazil (Black, Gledson and Gorga, in process), India (Apte, Balasubramaniam, Black and Khanna, in process), and followup work in Russia (Black, Goetzmann, Love, and Rachinsky, in process). Our hope is that a set of in-depth country studies can complement cross-country studies such as Durnev and Kim and Klapper and Love, and begin to shed some light on the difficult question of what economic factors prompt firms to make governance changes.

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Figure 1. Distribution of Corporate Governance Index, *CGI*

Histogram of distribution of corporate governance index (*CGI*) scores. Sample size = 525. Mean (median) =32.69 (29.80); minimum = 12.53; maximum = 86.93, standard deviation = 11.68; skewness = 1.5671.

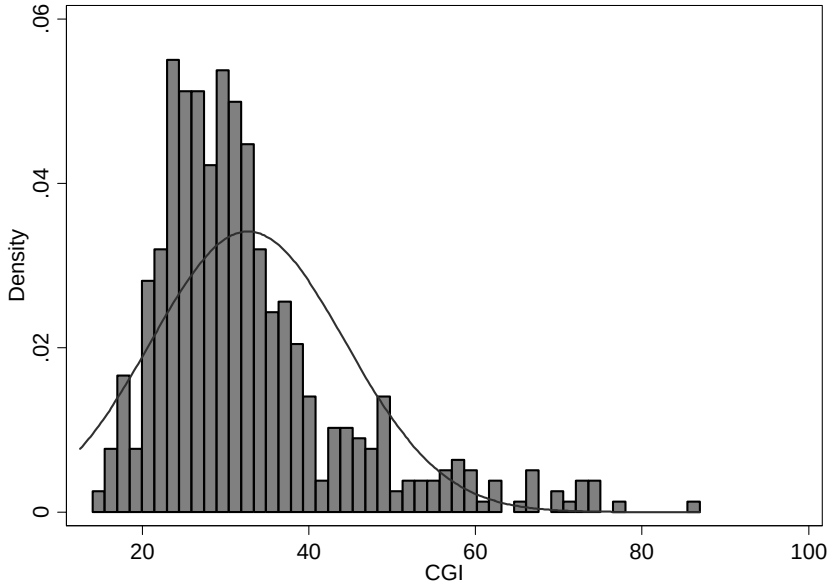

Figure 2: Asset Size and Corporate Governance

Scatter plot of *ln*(assets) versus corporate governance index (*CGI*). Two fitted lines are provided. The fitted lines are constrained to have a common slope, but can have different intercepts. The slope is estimated using all 525 firms for which we have data on *CGI*. The intercepts are separately estimated for two sub-samples: large firms (assets > 2 trillion won) and small firms (assets < 2 trillion won). The vertical line indicates 2 trillion won in assets.

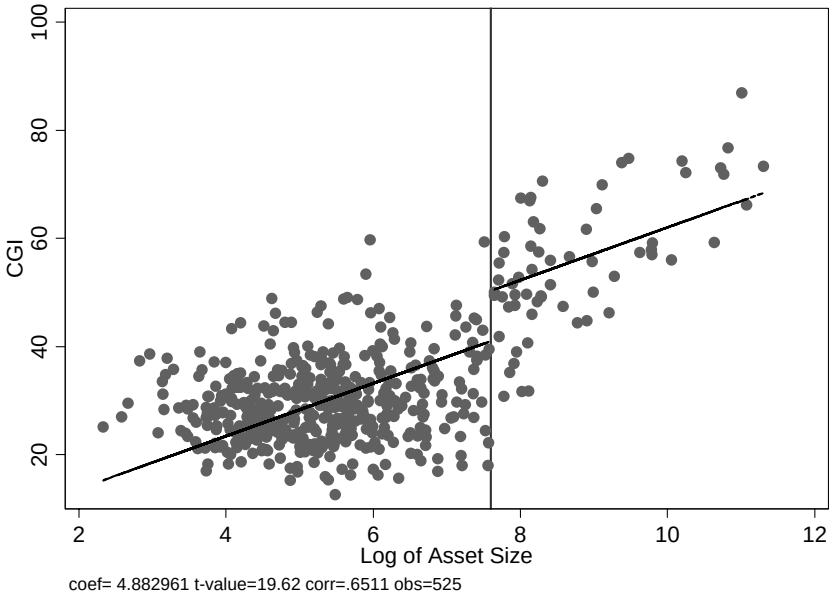

Table 1. Corporate Governance Index: Elements and Summary Statistics

Description and summary statistics for the 39 elements included in our overall Corporate Governance Index. For further details on individual governance elements, see Black, Jang, and Kim (2004), table 1.

Shareholder Rights Subindex

Label	Summary of the Variable (yes = 1, no = 0)	Responses	'1' Responses	Mean
A.1	Firm uses cumulative voting for election of directors.	534	31	0.06
A.2	Firm permits voting by mail.	534	68	0.13
A.3	Firm chooses shareholder meeting date to not overlap with other firms in same industry, or chooses meeting location to encourage attendance.	503	88	0.17
A.4	Firm discloses director candidates to shareholders in advance of shareholder meeting.	534	95	0.18
A.5	Board approval is required for related party transactions.	534	179	0.34

Board Structure Subindex

Label	Summary of the Variable (yes = 1, no = 0)	Responses	'1' Responses	Mean
B.1	Firm has at least 50% outside directors.	534	83	0.16
B.2	Firm has more than 50% outside directors.	534	28	0.05
B.3	Firm has outside director nominating committee.	534	85	0.16
B.4	Audit committee of the board of directors exists.	534	94	0.18

Board Procedure Subindex[25]

Label	Summary of the Variable (yes = 1, no = 0)	Responses	'1' Responses	Mean
C.1	Directors attend at least 75% of meetings, on average.	477	262	0.55
C.2	Directors' positions on board meeting agenda items are recorded in board minutes.	534	221	0.41
C.3	CEO and board chairman are different people.	534	26	0.05
C.4	A system for evaluating directors exists.	534	34	0.06
C.5	A bylaw to govern board meetings exists.	534	375	0.70
C.6	Firm holds four or more regular board meetings per year.	352	256	0.73
C.7	Firm has one or more foreign outside directors.	534	37	0.07
C.8	Outside directors do not receive retirement pay.	316	277	0.88
C.9	Outside directors can obtain advice from outside experts at the company's expense.	316	77	0.24
C.10	Firm has a system for evaluating outside directors or plans to have one.	504	152	0.30
C.11	Shareholders approve outside directors' aggregate pay (separate from shareholder approval of all directors' aggregate pay).	477	47	0.10
C.12	Outside directors attend at least 75% of meetings, on average.	459	193	0.42
C.13	Firm has code of conduct for outside directors.	534	41	0.08
C.14	Firm designates a contact person to support outside directors.	534	272	0.51
C.15	Board meeting solely for outside directors exists.	534	22	0.04
C.16	Firm has not lent outside directors funds to purchase unsubscribed shares from the company.	534	526	0.99
D.1	Ratio of outside directors in audit committee: 1 if ratio is more than the legal minimum of 2/3; 0 otherwise.	93	57	0.61
D.2	Bylaws governing audit committee (or internal auditor) exist.	484	317	0.65
D.3	Audit committee includes someone with expertise in accounting.	88	69	0.78
D.4	Audit committee (or internal auditor) recommends the external	490	364	0.74

[25] The small number of responses for questions D.3, D.8, and D.10 is because these questions apply only to companies that have an audit committee.

Label	Summary of the Variable (yes = 1, no = 0)	Responses	'1' Responses	Mean
	auditor at the annual shareholder meeting.			
D.5	Audit committee (or internal auditor) approves the appointment of the internal audit head.	399	187	0.47
D.6	Written minutes for audit committee (internal auditor) meetings.	262	159	0.61
D.7	Report on audit committee's (or internal auditor's) activities at the annual shareholder meeting.	468	417	0.89
D.8	Audit committee members attend at least 75% of meetings, on average.	67	64	0.96
D.9	Audit committee (or internal auditor) meets with external auditor to review financial statements.	487	327	0.67
D.10	Audit committee meets two or more times per year.	71	57	0.80

Disclosure Subindex

Label	Summary of the Variable (yes = 1, no = 0)	Responses	'1' Responses	Mean
E.1	Firm conducted investor relations activity in year 2000.	534	20	0.04
E.2	Firm website includes resumes of board members.	534	47	0.09
E.3	English disclosure exists.	494	23	0.05

Ownership Parity Subindex

Label	Summary of the Variable	Responses	'1' Responses	Mean
P	Ownership Parity = 1 - ownership disparity, where ownership disparity = ownership by all affiliated shareholders - ownership by largest shareholder.	525	continuous variable	0.83

Table 2. Definitions of Other Variables

This table provides a brief description of the other dependent and independent variables used in this paper. Accounting data are measured for the fiscal year (for balance sheet data, at the end of the fiscal year), ending between July 2000 and June 2001, most often Dec. 26, 2000. If more than one fiscal year ends during this period, we use the most recent fiscal year for balance sheet data and the most recent fiscal year that covers a full year for income statement data. For multiyear averages: (i) we use arithmetic averages except as otherwise stated; and (ii) if data is not available for the full period, we compute the average for the period for which data is available.. Monetary amounts are in billion won. Ownership data is measured at year-end 2000.

Principal Variables	**Description**
Assets	Book value of total assets
Asset Size Dummy	1 if book value of assets is greater than 2 trillion won; 0 otherwise.
Bank Dummy	1 if the firm is a commercial bank or a merchant bank; 0 otherwise.
SOE Dummy	1 if the firm is majority state-owned, or subject or formerly subject to the *Act on Privatization and Management Reform of Public Enterprises*, 0 otherwise. Equals 1 for Korea Electric Power, Korea Gas Corp., Korea Heavy Industries and Construction, Korea Telecom, Korea Tobacco and Ginseng, and Pohang Iron and Steel.
Chaebol Dummy	1 if a member of one of the top-30 business groups as of April 2000; 0 otherwise. The Korea Fair Trade Commission (*KFTC*) identifies the top-30 business groups (known as *chaebols*) and their members, in April of each year. We treat Pohang Iron and Steel, a former *SOE*, as a non-chaebol firm, even though the *KFTC* lists it as one of the top 30 business groups, because its history is not similar to traditional *chaebol* groups, which are family founded and controlled.
Sales Growth (g_{sales})	8-year geometric average sales growth (1993-2000), computed as $(sales_{2000}/sales_{1992})^{1/8}$, and similarly for other periods
Asset Growth (g_{asset})	8-year geometric average asset growth (1993-2000), computed as $(assets_{2000}/assets_{1992})^{1/8}$, and similarly for other periods.
Future Sales Growth	geometric average sales growth for 2001-2002, computed as $(sales_{2002}/sales_{2000})^{1/2}$
Profitability (net income/assets)	Net income divided by book value of total assets
Ordinary Income/Assets	Ordinary income divided by book value of total assets. Ordinary income is basically income before taxes and extraordinary items, but after interest payments.
EBIT/Assets	Earnings before interest and taxes (*EBIT*) divided by book value of total assets
Return on Equity (*ROE*)	Net income divided by book value of total equity.
Return on Trailing Equity (*RotrE*)	Net income divided by start-of-year book value of total equity, computed as *ROE*/(1 - *ROE*). We exclude 6 firms with negative book value of total equity.
Equity Finance Need (*EFN*), EFN_{raw} and EFN_{full}	8-year EFN_{full} is estimated as 8-year asset growth (g_{asset}) - 8-year return on trailing equity (*RotrE*), and similarly for other periods. EFN_{raw} is defined as max{0, EFN_{full}}. We obtain *EFN* by winsorizing large positive values of EFN_{raw} at 0.5.
Sole Ownership	Percentage share ownership by the largest shareholder (the shareholder that, together with its related parties, holds the largest number of shares). Related parties include relatives, affiliated firms, and company directors.
Total Affiliated Ownership	Percentage share ownership by all affiliated shareholders
Ownership Parity	1 - ownership disparity, where ownership disparity = total affiliated ownership - sole ownership (both measured as fractions)
Firm Risk	Standard deviation of firm's weekly share prices for 1998-2001
Leverage	Ln (debt/market value of common equity), winsorized at the 1% and 99% levels.
Market Share	Firm sales divided by total sales of all firms in the same 4-digit industry that are listed on *KSE* or registered on *KOSDAQ*
Capex/Sales	Ratio of capital expenditure to sales
Exports/Sales	Ratio of export revenue to sales. We assume this ratio is zero for the 66 firms in our sample with missing data for export revenue.

Principal Variables	**Description**
Years Listed	Number of years since original listing on the Korea Stock Exchange.
R&D/Sales	Ratio of research and development (*R&D*) expense to sales. We assume this ratio is zero for the 137 firms in our sample with missing data for *R&D* expense.
Advertising/Sales	Ratio of advertising expense to sales. We assume this ratio is zero for the 65 firms in our sample with missing data for advertising expense.
PPE/Sales	Ratio of property, plant and equipment to sales
Industry Dummy Variables	Dummy variables for membership in one of 12 2-digit or 41 4-digit industries with at least one firm in our sample, based on KSIC codes.
Other Variables	
Tobin's *q*	Estimated as market value of assets/book value of assets. We estimate market value of assets as (book value of debt + book value of preferred stock + market value of common stock). We measure book values at Dec. 31, 2000 and market values at June 29, 2001. Korean accounting rules require reasonably frequent updating of book values to reflect market values, so book value of assets should not differ markedly from replacement cost.
Market Value of Common Stock	Market value of common stock at June 29, 2001.
Market Value of Total Equity	Market value of common stock plus book value of preferred stock.
Share Turnover	Common shares traded during 2000 divided by common shares held by public shareholders, where common shares held by public shareholders = common shares outstanding × (1 -Total Affiliated Ownership).
Outcome-based Equity Finance Need (*EFN*-outcome)	Estimated as max{0, [change in (book value of equity - retained earnings)]/capex}, winsorized at 99%. For financial institutions, capital expenditures include net investment in financial assets. We drop 3 firms with zero capital expenditures.

Table 3. Descriptive Statistics and Correlations

Monetary amounts are in billion won.

Panel A. Descriptive Statistics

	No. of Obs.	'1' values (for dummy variables)	Mean	Median	Standard Deviation	Min	Max
Corporate Governance Variables							
Corporate Governance Index (*CGI*)	525	-	32.69	29.80	11.68	12.53	86.93
Shareholder Rights Subindex	525	-	3.47	4.00	3.66	0.00	16.00
Board Structure Subindex	525	-	2.64	0.00	5.31	0.00	20.00
Board Procedure Subindex	525	-	8.80	8.57	2.90	1.05	17.60
Disclosure Subindex	525	-	1.18	0.00	3.16	0.00	20.00
Ownership Parity Subindex	525	-	16.60	17.00	2.80	6.40	20.00
Other Variables							
Book Value of Assets	525	-	1,747.52	227.71	7,023.29	10.26	81,521.60
Market Value of Common Stock	525	-	361.23	41.30	1,884.35	2.01	29,038.07
ln(assets)	525	-	5.67	5.42	1.56	2.33	11.31
Asset Size Dummy	525	63	0.12	0.00	0.33	0.00	1.00
Bank Dummy	525	13	0.02	0.00	0.16	0.00	1.00
SOE Dummy	525	6	0.01	0.00	0.11	0.00	1.00
Chaebol Dummy	525	109	0.21	0.00	0.40	0.00	1.00
8-year Sales Growth	518	-	0.12	0.11	0.10	-0.16	0.78
2-year Future Sales Growth	512	-	0.05	0.04	0.30	-0.83	4.19
8-year Profitability (net income/assets)	520	-	0.02	0.02	0.04	-0.30	0.15
8-year Ordinary Income/Assets	520	-	0.03	0.02	0.05	-0.40	0.19
8-year EBIT/Assets	520	-	0.05	0.05	0.04	-0.17	0.20
8-year Net Income/Sales	524	-	0.01	0.02	0.08	-0.84	0.20
8-year Equity Finance Need (*EFN*)	513	-	0.11	0.07	0.13	0.00	0.50
8-year Eq. Finance Need (EFN_{full})	513	-	0.04	0.07	0.94	-15.08	0.99
8-year $EFN_{outcome}$ (winsorized at 99%)	510	-	2.13	0.79	3.91	0.00	22.76
8-year $EFN_{outcome\text{-}full}$	510		2.09	0.79	8.24	-65.27	117.40
Sole Ownership (%)	525	-	19.67	15.94	14.42	0.14	89.76
Leverage	525	-	0.95	0.89	1.26	-1.71	4.22
Firm Risk	525	-	0.11	0.11	0.03	0.05	0.19
Market Share	525	-	0.06	0.01	0.13	0.00	1.00
Capex/Sales	525	-	0.06	0.03	0.09	0.00	1.02
Export/Sales	524	-	0.26	0.13	0.30	0.00	1.00
Years Listed	525	-	15.82	13.00	9.28	1.00	45.00
ln(years listed)	525		2.54	2.56	0.73	0	3.81
R&D/Sales	525	-	0.01	0.00	0.06	0.00	1.32
Advertising/Sales	525	-	0.01	0.00	0.02	0.00	0.13
PPE/Sales	525	-	0.51	0.41	0.48	0.00	5.73
Tobin's *q*	525	-	0.85	0.81	0.29	0.32	3.04
Share Turnover	525	-	10.01	5.86	14.70	0.23	238.79

Panel B. Correlation Matrix for Selected Variables

Correlation matrix for selected variables from Panel A. Significant correlations (at 5% level or better) are shown in **boldface**.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	*CGI*	1.00																											
2	*CGI* - Parity	**0.97**	1.00																										
3	*Ln*(assets)	**0.65**	**0.69**	1.00																									
4	Asset Size Dummy	**0.73**	**0.77**	**0.73**	1.00																								
5	Bank Dummy	**0.47**	**0.47**	**0.39**	**0.36**	1.00																							
6	SOE Dummy	**0.26**	**0.28**	**0.26**	**0.29**	-0.02	1.00																						
7	*Chaebol*30 Dummy	**0.30**	**0.33**	**0.45**	**0.41**	0.01	-0.05	1.00																					
8	Sales Growth	**0.28**	**0.28**	**0.26**	**0.19**	**0.12**	-0.02	**0.18**	1.00																				
9	Future Sales Growth	-0.07	-0.06	-0.10	-0.06	-0.04	0.00	-0.02	**-0.16**	1.00																			
10	Asset Growth	**0.19**	**0.19**	**0.20**	**0.15**	0.02	0.00	**0.10**	**0.76**	-0.07	1.00																		
11	Profitability	**-0.13**	**-0.08**	-0.04	-0.04	-0.06	0.07	**-0.09**	**0.26**	0.00	**0.37**	1.00																	
12	Ordinary income/assets	**-0.13**	**-0.09**	-0.05	-0.07	-0.08	0.07	-0.08	**0.28**	0.00	**0.41**	**0.91**	1.00																
13	EBIT/assets	**-0.12**	-0.10	**-0.09**	**-0.09**	**-0.19**	0.05	-0.03	**0.24**	-0.02	**0.30**	**0.67**	**0.74**	1.00															
14	*EFN*	**0.29**	**0.24**	**0.19**	**0.17**	**0.12**	-0.04	**0.12**	**0.21**	**-0.10**	**0.24**	**-0.56**	**-0.49**	**-0.38**	1.00														
15	$EFN_{outcome}$	**-0.12**	**-0.13**	**-0.13**	**-0.11**	-0.08	-0.05	-0.06	0.01	-0.03	**0.13**	-0.08	-0.01	-0.02	**0.11**	1.00													
16	Sole Ownership	0.01	-0.07	0.01	0.00	0.00	0.08	0.03	0.02	0.02	-0.02	0.04	0.05	0.00	0.00	0.01	1.00												
17	Ownership Parity	**0.36**	**0.14**	0.02	0.05	**0.14**	-0.03	-0.03	**0.11**	-0.02	0.07	**-0.20**	**-0.18**	**-0.09**	**0.27**	0.03	**0.29**	1.00											
18	Leverage	**0.19**	**0.19**	**0.43**	**0.24**	**0.30**	-0.07	**0.15**	**-0.13**	-0.05	**-0.16**	**-0.40**	**-0.46**	**-0.42**	**0.30**	**-0.11**	-0.02	0.04	1.00										
19	Firm Risk	0.05	-0.02	**-0.19**	-0.08	-0.01	**-0.18**	-0.06	**-0.11**	-0.01	**-0.19**	**-0.48**	**-0.49**	**-0.37**	**0.40**	**0.14**	0.00	**0.32**	**0.22**	1.00									
20	Market Share	**0.35**	**0.38**	**0.45**	**0.39**	0.02	**0.36**	**0.29**	**0.24**	-0.02	**0.18**	-0.05	-0.03	-0.01	**0.11**	-0.08	-0.05	0.01	0.06	-0.10	1.00								
21	Capex/Sales	0.05	0.06	0.05	0.03	**-0.09**	**0.12**	0.02	**0.10**	**0.24**	**0.19**	**0.11**	**0.11**	0.07	**0.11**	**-0.11**	0.02	-0.04	-0.06	-0.04	0.04	1.00							
22	Exports/Sales	0.00	0.00	-0.05	0.00	**-0.14**	-0.05	0.07	**0.09**	**-0.16**	**0.16**	**0.12**	**0.13**	**0.10**	0.03	0.05	-0.06	0.02	**-0.12**	-0.06	0.03	**0.13**	1.00						
23	*R&D*/Sales	-0.01	-0.02	-0.06	-0.02	-0.03	0.01	-0.03	0.02	-0.03	0.02	-0.03	-0.03	0.00	0.05	-0.03	-0.01	0.05	-0.05	0.08	-0.02	0.05	0.08	1.00					
24	Advertising/Sales	-0.06	-0.05	-0.06	-0.06	-0.07	-0.01	-0.07	**-0.09**	0.08	-0.04	0.06	0.08	0.30	**-0.09**	-0.02	-0.07	-0.03	**-0.11**	**-0.09**	0.00	-0.01	**-0.23**	0.02	1.00				
25	PPE/Sales	-0.04	-0.02	0.07	0.03	**-0.09**	**0.16**	0.03	**-0.26**	**0.23**	-0.04	**-0.10**	**-0.11**	-0.08	0.07	0.00	0.02	**-0.09**	0.02	-0.07	0.06	**0.34**	0.01	0.00	0.04	1.00			
26	*Ln*(listed years)	0.04	0.05	**0.19**	0.08	0.05	**-0.19**	**0.14**	**-0.26**	-0.06	**-0.28**	**-0.31**	**-0.34**	**-0.24**	0.03	-0.03	**-0.21**	-0.05	**0.18**	0.01	0.01	-0.08	**-0.09**	-0.03	**0.12**	**0.16**	1.00		
27	Tobin's *q*	**0.25**	**0.20**	0.00	**0.15**	0.08	0.05	0.05	**0.12**	**0.12**	0.07	**-0.16**	**-0.14**	-0.01	**0.26**	**-0.11**	0.04	**0.26**	0.05	**0.32**	**0.10**	**0.11**	0.01	0.04	0.09	**-0.18**	**-0.14**	1.00	
28	Share Turnover	-0.06	**-0.10**	**-0.17**	**-0.11**	-0.06	-0.06	**-0.11**	-0.07	-0.09	-0.04	**-0.27**	**-0.27**	**-0.24**	**0.23**	**0.16**	**0.09**	**0.14**	**0.14**	**0.44**	0.00	**-0.09**	-0.01	0.04	0.01	-0.05	0.07	**0.15**	1.00

Panel C. Correlation Matrix for Corporate Governance Index and Subindices

Correlations among our overall corporate governance index *CGI, CGI* - Ownership Parity Subindex, each subindex, and an asset size dummy at 2 trillion won. Sample size is 525. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. Statistically significant correlations (at 5% level or better) are shown in **boldface**.

	CGI	*CGI* - Disclosure	*CGI* - Parity	Shareholder Rights	Board Structure	Board Procedure	Disclosure	Ownership Parity	Asset size dummy
CGI	1.00								
CGI - Disclosure	**0.97*** **	1.00							
CGI - Parity	**0.97*** **	**0.93*** **	1.00						
Shareholder Rights Subindex	**0.65*** **	**0.66*** **	**0.67*** **	1.00					
Board Structure Subindex	**0.81*** **	**0.83*** **	**0.83*** **	**0.32*** **	1.00				
Board Procedure Subindex	**0.73*** **	**0.75*** **	**0.74*** **	**0.39*** **	**0.55*** **	1.00			
Disclosure Subindex	**0.59*** **	**0.37*** **	**0.61*** **	**0.26*** **	**0.33*** **	**0.30*** **	1.00		
Ownership Parity Subindex	**0.37*** **	**0.40*** **	**0.14*** **	**0.09** **	**0.11** **	**0.13*** **	0.08*	1.00	
Asset size dummy	**0.73*** **	**0.73*** **	**0.77*** **	**0.32*** **	**0.87*** **	**0.50*** **	**0.37*** **	0.05	1.00

Table 4. Factors That Predict Corporate Governance: In General

Ordinary least squares regressions of Corporate Governance Index (*CGI*) on indicated control variables, added sequentially, followed by regressions of [CGI - Disclosure] and [*CGI* - Parity] reduced indices on these control variables plus the omitted subindex (Disclosure or Ownership Parity). *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. *t*-values, based on White's heteroskedasticity-consistent standard errors, are reported in parentheses. Significant results (at 5% level or better) are shown in **boldface**.

	Corporate Governance Index (*CGI*)					*CGI* - Disclosure	*CGI* - Parity
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Industry Dummies	2-digit	2-digit	2-digit	2-digit	4-digit	4-digit	4-digit
Asset Size Dummy	**21.4818*** **	**17.0872*** **	**15.3647*** **	**15.4177*** **	**15.3307*** **	**14.8282*** **	**14.9666*** **
	(13.49)	**(9.34)**	**(8.41)**	**(8.31)**	**(7.84)**	**(9.14)**	**(9.08)**
Bank Dummy	**17.4607*** **	**16.2469*** **	**18.6118*** **	**19.0636*** **	**17.3595*** **	**12.8116*** **	**14.1097*** **
	(5.48)	**(5.28)**	**(6.38)**	**(6.34)**	**(3.95)**	**(3.60)**	**(3.48)**
SOE Dummy	**9.5284*** **	**12.0264*** **	**8.9255*** **	**9.7802*** **	6.8224*	3.7825	6.2632
	(3.34)	**(4.32)**	**(2.93)**	**(3.07)**	(1.78)	(1.39)	(1.51)
Ln(assets)		**1.0473*** **	**1.9116*** **	**1.8378*** **	**2.1861*** **	**1.1558*** **	**1.8566*** **
		(2.91)	**(4.64)**	**(4.13)**	**(4.61)**	**(2.65)**	**(4.27)**
8-Year Sales Growth		**18.5641*** **	**12.4554*** **	**10.6181** **	4.5228	**12.8165*** **	2.7098
		(4.49)	**(3.24)**	**(2.49)**	(0.87)	**(2.85)**	(0.57)
8-Year Profitability (net		**-36.7715*** **	**-26.7415*** **	**-27.5711*** **	**-22.8770*** **	**-23.6490*** **	-12.9750
income/assets)		**(5.13)**	**(3.46)**	**(3.45)**	**(2.73)**	**(3.35)**	(1.53)
Sole Ownership		0.0567	0.0795	0.0937	**0.1262** **	**0.1389*** **	-0.0197
		(0.89)	(1.33)	(1.49)	**(2.00)**	**(2.63)**	(0.34)
Sole Ownership^2		-0.0009	-0.0013	-0.0014*	**-0.0017** **	**-0.0018** **	-0.0008
		(1.07)	(1.59)	(1.70)	**(2.00)**	**(2.46)**	(0.96)
Chaebol Dummy		0.2264	0.1824	0.1001	-0.0143	-0.4586	1.2570
		(0.22)	(0.18)	(0.10)	(0.01)	(0.47)	(1.27)
Firm Risk			**69.5620*** **	**69.8190*** **	**62.1212*** **	**49.1331*** **	14.4764
			(4.21)	**(4.14)**	**(3.65)**	**(3.20)**	(0.97)
Leverage			**-1.1900*** **	**-1.0880*** **	**-0.9190** **	-0.3026	**-0.7086** **
			(3.38)	**(3.09)**	**(2.42)**	(0.92)	**(2.03)**
Market Share			5.0124	5.5777	8.1527	1.6680	5.1052
			(1.42)	(1.52)	(1.50)	(0.39)	(1.03)
Ln (years listed)				0.3829	0.3587	0.7106	-0.0599
				(0.67)	(0.59)	(1.32)	(0.11)
Exports/Sales				1.7662	0.2038	1.6951	-0.3382
				(1.54)	(0.13)	(1.26)	(0.27)
Capex/Sales				6.2863	4.7245	2.0184	5.6029
				(1.42)	(1.10)	(0.56)	(1.39)
R&D/Sales				-1.0012	-3.1448	-2.4849	-2.8212
				(0.30)	(1.21)	(1.07)	(1.26)
Advertising/Sales				10.2489	20.9285	30.5369	20.2332
				(0.56)	(0.99)	(1.50)	(1.10)
PPE/Sales				**-1.3638** **	-1.0701*	-0.4373	-0.4974
				(2.00)	(1.65)	(0.72)	(0.90)
Ownership Parity Subindex							**0.3349*** **
							(3.01)
Disclosure Subindex						**0.2449*** **	
						(2.81)	
Intercept Term	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample Size	525	518	518	517	517	517	517
Adjusted R^2	0.5944	0.6320	0.6525	0.6530	0.6624	0.6634	0.6985

Table 5. Results for Subindices and Reduced Indices

Ordinary least squares regressions of subindices of our Corporate Governance Index (*CGI*), and corresponding reduced indices (CGI - indicated subindex) on the same control variables as in our base 4-digit regression (*Table 4,regression (5)*) *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. *t*-values, based on White's heteroskedasticity-consistent standard errors, are reported in parentheses. Significant results (at 5% level or better) are shown in **boldface**.

Subindex or Reduced Index	(1) **Shareholder Rights**	(2) **Board Structure**	(3) **Board Procedure**	(4) **Disclosure**	(5) **Ownership Parity**	(6) ***CGI*-Sh. Rights**	(7) ***CGI*-Structure**	(8) ***CGI*-Procedure**	(9) ***CGI*-Disclosure**	(10) ***CGI*-Parity**
Asset Size Dummy	1.1556	**12.1751*** **	**1.6113*** **	0.4036	-0.0150	**14.1750*** **	3.1555*	**13.7194*** **	**14.9271*** **	**14.9616*** **
	(1.42)	**(14.47)**	**(3.10)**	(0.50)	(0.03)	**(8.72)**	(1.91)	**(7.92)**	**(9.09)**	**(8.88)**
Bank Dummy	**4.7719*** **	4.1574*	**2.5019*** **	**3.6534** **	**2.2749** **	**12.5876*** **	**13.2021*** **	**14.8576*** **	**13.7062*** **	**14.8715*** **
	(3.01)	(1.92)	**(2.96)**	**(2.37)**	**(2.50)**	**(3.60)**	**(3.94)**	**(3.78)**	**(3.80)**	**(3.66)**
SOE Dummy	0.5618	0.6639	**3.0661*** **	2.4419	0.0887	6.2605*	6.1585	3.7563	4.3804*	6.2929
	(0.21)	(0.31)	**(3.43)**	(0.87)	(0.09)	(1.92)	(1.38)	(1.10)	(1.67)	(1.57)
Ln(assets)	0.3336	0.1542	**0.6951*** **	**0.8276*** **	0.1755	**1.8524*** **	**2.0318*** **	**1.4909*** **	**1.3585*** **	**1.9154*** **
	(1.53)	(0.70)	**(4.19)**	**(4.24)**	(1.05)	**(4.98)**	**(4.80)**	**(3.67)**	**(3.15)**	**(4.41)**
Sales Growth	2.7039	4.4438*	2.7341*	**-6.6623*** **	1.3033	1.8189	0.0789	1.7887	**11.1851** **	3.1462
	(1.08)	(1.84)	(1.85)	**(3.30)**	(0.84)	(0.44)	(0.02)	(0.38)	**(2.49)**	(0.66)
Profitability	**-13.1933*** **	-2.8402	-0.3624	0.6201	**-7.1012** **	-9.6837	**-20.0368*** **	**-22.5146*** **	**-23.4971*** **	-15.3530*
	(3.24)	(0.93)	(0.10)	(0.19)	**(2.42)**	(1.47)	**(2.60)**	**(3.26)**	**(3.29)**	(1.88)
Sole Ownership	-0.0033	0.0180	0.0079	-0.0102	**0.1138*** **	**0.1295** **	0.1082*	**0.1183** **	**0.1364** **	0.0184
	(0.12)	(0.73)	(0.36)	(0.37)	**(5.03)**	**(2.50)**	(1.92)	**(2.18)**	**(2.57)**	(0.32)
Sole Ownership^2	-0.0003	-0.0004	-0.0003	0.0000	**-0.0007** **	-0.0014*	-0.0013*	-0.0015*	**-0.0018** **	-0.0011
	(0.97)	(1.15)	(0.83)	(0.11)	**(2.37)**	(1.87)	(1.78)	(1.96)	**(2.45)**	(1.28)
Chaebol Dummy	0.0325	0.5045	0.0472	0.3570	**-0.9553** **	-0.0468	-0.5187	-0.0614	-0.3712	0.9371
	(0.07)	(0.91)	(0.15)	(0.83)	**(2.40)**	(0.05)	(0.57)	(0.06)	(0.38)	(0.95)
Firm Risk	-11.0528	**13.7278** **	**12.3785** **	10.4333*	**36.6345*** **	**73.1740*** **	**48.3934*** **	**49.7427*** **	**51.6879*** **	26.7443*
	(1.54)	**(2.09)**	**(2.05)**	(1.79)	**(6.09)**	**(5.11)**	**(3.32)**	**(3.54)**	**(3.36)**	(1.83)
Leverage	-0.1277	-0.0911	-0.0527	**-0.4951*** **	-0.1523	**-0.7913** **	**-0.8278** **	**-0.8662*** **	-0.4239	**-0.7596** **
	(0.75)	(0.61)	(0.38)	**(3.17)**	(1.23)	**(2.51)**	**(2.49)**	**(2.74)**	(1.29)	**(2.18)**
Market Share	2.0114	0.4333	-2.2886	5.2091	2.7875*	6.1413	7.7194	**10.4413** **	2.9435	6.0386
	(0.83)	(0.24)	(1.57)	(1.50)	(1.96)	(1.37)	(1.52)	**(2.10)**	(0.70)	(1.21)
Ln (years listed)	-0.4161	0.2862	**0.4691** **	-0.2827	0.3021	0.7748	0.0725	-0.1104	0.6414	0.0413
	(1.43)	(1.31)	**(2.26)**	(1.12)	(1.48)	(1.60)	(0.13)	(0.21)	(1.19)	(0.08)
Exports/Sales	0.9332	0.4283	-0.4070	**-1.1980** **	0.4473	-0.7295	-0.2245	0.6108	1.4018	-0.1884
	(1.22)	(0.78)	(0.79)	**(2.08)**	(0.81)	(0.58)	(0.17)	(0.45)	(1.05)	(0.15)
Capex/Sales	1.5890	0.6482	1.0481	2.1738	-0.7346	3.1355	4.0763	3.6764	2.5507	5.3569
	(0.89)	(0.39)	(0.85)	(1.21)	(0.55)	(0.96)	(1.13)	(0.98)	(0.70)	(1.34)
R&D/Sales	**-1.9910** **	-0.9710	0.6060	-0.5301	-0.2587	-1.1539	-2.1738	-3.7508*	-2.6147	-2.9078
	(2.04)	(1.20)	(0.43)	(0.83)	(0.41)	(0.56)	(1.02)	(1.79)	(1.11)	(1.28)
Advertising/Sales	8.8750	12.9412	5.6145	-7.7184	1.2161	12.0535	7.9873	15.3140	28.6469	20.6405
	(1.02)	(1.57)	(0.59)	(1.37)	(0.19)	(0.69)	(0.45)	(1.01)	(1.41)	(1.11)
PPE/Sales	-0.1044	0.1412	-0.1748	-0.5084*	-0.4238	-0.9658*	-1.2113*	-0.8954	-0.5618	-0.6393
	(0.33)	(0.47)	(0.84)	(1.83)	(1.41)	(1.80)	(1.96)	(1.58)	(0.94)	(1.18)
Industry Dummies	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit
Intercept Term	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample Size	517	517	517	517	517	517	517	517	517	517
Adjusted R^2	0.2478	0.7760	0.3378	0.2492	0.2789	0.6738	0.4203	0.6492	0.6598	0.6936

Table 6A. Results for Subsamples

Ordinary least squares regressions of Corporate Governance Index (*CGI*) on the same control variables as in our basic 2-digit and 4-digit regressions (*Table 4,regression (4-5)*), for the indicated subsamples We use 2-digit industry dummies for smaller subsamples (large firms, chaebol firms) to conserve degrees of freedom, but otherwise use 4-digit industry dummies. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. *t*-values, based on White's heteroskedasticity-consistent standard errors, are reported in parentheses. Significant results (at 5% level or better) are shown in **boldface**.

	(1)	(2)	(3)	(4)	(5)
Subsample	**small**	**large**	**Non-chaebol**	**chaebol**	**Small non-chaebol**
Industry dummies	4-digit	2-digit	4-digit	2-digit	4-digit
Asset Size Dummy			**17.5557*** **	**11.9482*** **	
			(4.92)	**(3.63)**	
Bank Dummy	**19.4533*** **	**18.7375*** **	**19.1336*** **	**18.6509** **	
	(3.30)	**(3.23)**	**(3.78)**	**(2.26)**	
SOE Dummy		-16.6748*	**11.5716** **		
		(1.74)	**(2.55)**		
Ln(assets)	**1.5278*** **	**4.4499** **	**1.6124*** **	**3.6468*** **	**1.4147*** **
	(3.25)	**(2.59)**	**(3.01)**	**(3.20)**	**(2.65)**
Sales Growth	9.3041*	-13.6278	6.4468	-0.3468	10.3154*
	(1.78)	(0.89)	(1.08)	(0.03)	(1.79)
Profitability	**-19.8742*** **	86.7325	**-21.8103*** **	-14.4278	**-21.3092** **
	(2.59)	(0.88)	**(2.63)**	(0.42)	**(2.59)**
Sole Ownership	**0.1314** **	0.0336	**0.1565** **	0.0517	0.1205
	(2.06)	(0.13)	**(2.07)**	(0.30)	(1.57)
Sole Ownership^2	-0.0016*	-0.0019	-0.0020*	-0.0011	-0.0013
	(1.85)	(0.56)	(1.80)	(0.51)	(1.12)
Chaebol Dummy	0.2324	-9.7831*			
	(0.21)	(1.98)			
Firm Risk	**65.6386*** **	140.1840	**63.7925*** **	89.2019	**62.0767*** **
	(3.85)	(1.48)	**(3.54)**	(1.38)	**(3.42)**
Leverage	-0.2436	**-4.9894*** **	-0.2528	**-3.0569*** **	-0.2233
	(0.63)	**(2.98)**	(0.60)	**(3.36)**	(0.52)
Market Share	yes	yes	yes	yes	yes
Ln (years listed)	yes	yes	yes	yes	yes
Exports/Sales	yes	yes	yes	yes	yes
Capex/Sales	yes	yes	yes	yes	yes
R&D/Sales	yes	yes	yes	yes	yes
Advertising/Sales	yes	yes	yes	yes	yes
PPE/Sales	yes	yes	yes	yes	yes
Intercept term	yes	yes	yes	yes	yes
Sample Size	454	63	410	107	388
Adjusted R^2	0.2134	0.5031	0.6275	0.6221	0.1493

Table 6B. Subsample Results for Equity Finance Need

Regressions for indicated subsamples of *CGI* on equity finance need (*EFN*), as defined in *Table 8*, with other control variables as in *Table 8*, regressions (4-5). *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. *t*-values, based on White's heteroskedasticity-consistent standard errors, are reported in parentheses. Significant results (at 5% level or better) are shown in **boldface**.

	(1)	(2)	(3)	(4)	(5)
Subsample	**small**	**large**	**Non-chaebol**	**chaebol**	**Small non-chaebol**
Industry dummies	4-digit	2-digit	4-digit	2-digit	4-digit
Equity Finance Need (EFN)	**10.7929*** **	-9.1274	**10.9926*** **	0.9323	**12.3763*** **
	(3.42)	(0.78)	**(3.32)**	(0.12)	**(3.73)**
other control variables	yes	yes	yes	yes	yes
Intercept term	yes	yes	yes	yes	yes
Sample Size	449	63	406	106	384
Adjusted R^2	0.2228	0.5017	0.6360	0.6271	0.1633

Table 7A. Growth and Profitability: Different Averaging Periods and Definitions; 2-Digit Industry Dummies

Coefficients from regressions with 2-digit industry dummies, similar to *Table 4*, regression (4), except using different averaging periods for sales growth and profitability. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. *t*-values, based on White's heteroskedasticity-consistent standard errors, are reported in parentheses. Significant results (at 5% level or better) are shown in **boldface**.

Dependent Variable		Corporate Governance Index (*CGI*)									
Set	**Averaging Period**	2-years	3-years	4-years	5-years	6-years	7-years	8-years	9 years	10 years	11 years
	Sales Growth	-0.0301	0.4755	1.1272	4.3076*	**7.1364****	**9.7123*****	**10.6181****	9.5314*	7.0359	8.1059
		(0.02)	(0.19)	(0.50)	(1.80)	**(2.29)**	**(2.74)**	**(2.49)**	(1.94)	(1.16)	(1.31)
1	Net Income/Assets	**-8.3863****	**-11.9845*****	**-15.8190*****	**-18.7372*****	**-21.0050*****	**-24.4663*****	**-27.5711*****	**-29.7058*****	**-30.5852*****	**-31.6334*****
		(2.33)	**(3.18)**	**(3.24)**	**(3.41)**	**(3.27)**	**(3.38)**	**(3.45)**	**(3.38)**	**(3.16)**	**(3.08)**
	Adjusted R^2	0.6464	0.6490	0.6495	0.6511	0.6515	0.6532	0.6530	0.6517	0.6502	0.6504

Table 7B. Growth and Profitability: Different Averaging Periods and Definitions; 4-digit Industry Dummies

Coefficients on indicated variables for regressions with 4-digit industry dummies, using different time periods to measure growth and profitability and different measures of profitability. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. *t*-values, based on White's heteroskedasticity-consistent standard errors, are reported in parentheses. Significant results (at 5% level or better) are shown in **boldface**.

Dependent Variable		Corporate Governance Index (*CGI*)									
Set	Averaging Period	2-years	3-years	4-years	5-years	6-years	7-years	8-years	9 years	10 years	11 years
	Sales Growth	-2.3469	-2.0482	-1.3366	-0.1592	0.5490	3.2362	4.5228	3.6578	2.2490	2.9461
		(1.42)	(0.70)	(0.49)	(0.05)	(0.13)	(0.68)	(0.87)	(0.65)	(0.36)	(0.46)
1	Net Income/Assets	**-6.7853****	**-8.8365****	**-12.5516*****	**-14.7073*****	**-16.4615****	**-19.9828*****	**-22.8770*****	**-24.4071*****	**-25.6025*****	**-27.1371*****
		(1.98)	**(2.48)**	**(2.64)**	**(2.64)**	**(2.47)**	**(2.62)**	**(2.73)**	**(2.69)**	**(2.59)**	**(2.61)**
	Adjusted R^2	0.6615	0.6621	0.6624	0.6620	0.6616	0.6621	0.6624	0.6622	0.6621	0.6621
	Sales Growth	-2.2774	-2.1283	-1.4251	-0.3918	0.1975	3.1119	4.5533	3.5704	2.1705	2.8695
		(1.39)	(0.72)	(0.51)	(0.12)	(0.05)	(0.65)	(0.87)	(0.63)	(0.34)	(0.44)
2	Ordinary Income/Assets	-5.7559*	-7.4631	-9.4734*	-11.6656*	-13.1937*	**-17.5105****	**-20.8737****	**-21.4739****	**-21.8821****	**-22.6847****
		(1.66)	(1.65)	(1.72)	(1.84)	(1.82)	**(2.11)**	**(2.31)**	**(2.28)**	**(2.22)**	**(2.27)**
	Adjusted R^2	0.6610	0.6612	0.6608	0.6606	0.6606	0.6615	0.6623	0.6620	0.6618	0.6619
	Sales Growth	-2.0417	-2.8741	-2.3086	-1.4633	-1.5632	0.7647	1.9085	0.8147	-0.3127	0.5103
		(1.22)	(0.97)	(0.85)	(0.45)	(0.36)	(0.16)	(0.36)	(0.14)	(0.05)	(0.08)
3	EBIT/Assets	0.4120	-1.3818	-1.2485	-0.5408	1.1160	-0.2484	-0.9786	0.8269	1.7394	1.8217
		(0.07)	(0.22)	(0.17)	(0.07)	(0.13)	(0.03)	(0.09)	(0.08)	(0.16)	(0.16)
	Adjusted R^2	0.6596	0.6592	0.6587	0.6583	0.6582	0.6581	0.6582	0.6582	0.6581	0.6582
	Sales Growth (profitability	-2.0393	-2.9738	-2.3726	-1.4932	-1.4719	0.7397	1.7922	0.9172	-0.1219	0.7167
4	variable omitted)	(1.22)	(1.04)	(0.89)	(0.47)	(0.35)	(0.16)	(0.36)	(0.17)	(0.02)	(0.12)
	Adjusted R^2	0.6603	0.6599	0.6595	0.6590	0.6590	0.6589	0.6590	0.6589	0.6589	0.6589
	Net Income/Assets	-6.0559*	**-9.7492*****	**-13.3982*****	**-15.3045*****	**-16.9667*****	**-19.3662****	**-21.8006*****	**-23.8858*****	**-25.8793*****	**-27.2976*****
5	(sales growth omitted)	(1.73)	**(2.79)**	**(2.83)**	**(2.77)**	**(2.60)**	**(2.55)**	**(2.61)**	**(2.64)**	**(2.64)**	**(2.62)**
	Adjusted R^2	0.6593	0.6614	0.6621	0.6619	0.6616	0.6617	0.6618	0.6619	0.6620	0.6620

Table 8. Corporate Governance and Equity Finance Need

Ordinary least squares regression of *CGI* on 8-year equity finance need (*EFN*), defined as max{0, [asset growth rate (g_{asset}) - return on trailing equity (*RotrE)]*} with large positive values of *EFN* winsorized at 0.5. Other control variables are added sequentially as shown. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. *t*-values, based on White's heteroskedasticity-consistent standard errors, are reported in parentheses. Significant results (at 5% level or better) are shown in **boldface**.

	Corporate Governance Index (*CGI*)					*CGI* - Parity
	(1)	(2)	(3)	(4)	(5)	(6)
Industry Dummies	2-digit	2-digit	2-digit	2-digit	4-digit	4-digit
Asset Size Dummy	**21.4818*** **	**16.9117*** **	**15.1139*** **	**15.1244*** **	**15.3842*** **	**15.0830*** **
	(13.49)	**(8.89)**	**(8.13)**	**(8.02)**	**(7.77)**	**(9.06)**
Bank Dummy	**17.4607*** **	**16.6698*** **	**19.4818*** **	**19.6128*** **	**18.5272*** **	**14.7428*** **
	(5.48)	**(5.16)**	**(6.54)**	**(6.38)**	**(4.19)**	**(3.53)**
SOE Dummy	**9.5284*** **	**10.4360*** **	**6.9873** **	**8.7036** **	**7.2346** **	6.3996
	(3.34)	**(3.68)**	**(2.12)**	**(2.58)**	**(1.97)**	(1.61)
Ln(assets)		**1.1281*** **	**1.8687*** **	**1.8148*** **	**1.9537*** **	**1.7171*** **
		(3.02)	**(4.61)**	**(4.30)**	**(4.19)**	**(4.09)**
Equity Finance Need (*EFN*)		**13.2731*** **	**10.9690*** **	**10.5899*** **	**8.5065** **	4.8895*
		(4.59)	**(3.56)**	**(3.39)**	**(2.50)**	(1.68)
Sole Ownership		0.0667	0.0865	0.0969	0.1222*	-0.0196
		(1.04)	(1.44)	(1.54)	(1.93)	(0.34)
Sole Ownership^2		-0.0012	-0.0015*	-0.0016*	-0.0017*	-0.0009
		(1.30)	(1.78)	(1.81)	(1.95)	(1.05)
Chaebol Dummy		0.7274	0.5653	0.4605	0.2242	1.4291
		(0.67)	(0.55)	(0.45)	(0.21)	(1.43)
Firm Risk			**63.5517*** **	**66.0909*** **	**56.4641*** **	10.0633
			(3.82)	**(3.92)**	**(3.23)**	(0.69)
Leverage			**-1.4505*** **	**-1.2718*** **	**-0.8813** **	-0.6751*
			(4.00)	**(3.52)**	**(2.26)**	(1.93)
Market Share			7.5665*	7.5895*	9.8777*	6.1604
			(1.81)	(1.79)	(1.83)	(1.24)
Ln(listed years)				0.5253	0.5174	-0.0224
				(0.98)	(0.94)	(0.05)
Exports/Sales				1.3594	-0.0731	-0.5373
				(1.16)	(0.05)	(0.42)
Capex/Sales				5.0149	3.5430	4.9827
				(1.05)	(0.79)	(1.19)
R&D/Sales				-0.4322	-2.8307	-2.6127
				(0.12)	(1.05)	(1.14)
Advertising/Sales				6.4347	19.3587	19.3130
				(0.37)	(0.96)	(1.08)
PPE/Sales				**-1.8962*** **	**-1.3188** **	-0.6519
				(2.89)	**(2.18)**	(1.30)
Ownership Parity Subindex						**0.3328*** **
						(2.91)
Intercept Term	Yes	Yes	Yes	Yes	Yes	Yes
Sample Size	525	513	513	512	512	512
Adjusted R^2	0.5944	0.6282	0.6519	0.6556	0.6667	0.7042
firms with *EFN* = 0 (negative *ROtrE* in parentheses)	106 (5)	106 (5)	106 (5)	106 (5)	106 (5)	106 (5)
firms with 0 < *EFN* ≤ 0.5	385 (115)	385 (115)	385 (115)	384 (115)	384 (115)	384 (115)
Firms with *EFN* > 0.5	34 (21)	22 (21)	22 (21)	22 (21)	22 (21)	22 (21)

Table 9. Corporate Governance and Equity Finance Need: Different Averaging Periods and Definitions

Coefficients on equity finance need from regressions of *CGI*, similar to *Table 8, regression (5)* using different averaging periods for *EFN* and different definitions of *EFN*. For $EFN_{winsorize}$, we winsorize the top 1% of values of *EFN-0*. EFN_{raw} is defined as max{0, g_{asset} - *RotrE*}. EFN_{full} is defined as g_{assetv} - *RotrE*, and thus can take both negative and positive values. $EFN_{outcome}$ is an outcome-based measure defined as max {0, [change in (book value of equity – retained earnings)]/capex}, winsorized at 99%. For financial institutions, capital expenditure is measured as cash outflow from investment in all assets, not just nonfinancial assets. Other control variables are the same as *Table 8, regression (5)* but are not shown. For the rows showing distribution of values of EFN_{full}, numbers in parentheses indicate the number of firms with negative *ROE*. Sample size is 512 except for $EFN_{outcome}$, for which sample size is 509. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. *t*-values, based on White's heteroskedasticity-consistent standard errors, are reported in parentheses. Significant results (at 5% level or better) are shown in **boldface**.

		Corporate Governance Index (*CGI*)									
Line		2-Year	3-Year	4-Year	5-Year	6-Year	7-Year	8-Year	9-Year	10-Year	11-year
(1)	*EFN* (lower bound 0; upper bound 0.5)	1.2191 (0.46)	2.4977 (0.84)	4.0559 (1.40)	3.9810 (1.30)	5.7086* (1.78)	**7.3341** (2.23)**	**8.5334** (2.51)**	**8.9426** (2.54)**	**9.4372** (2.65)***	**7.7330** (2.13)**
	adjusted R^2	0.6607	0.6611	0.6622	0.6621	0.6635	0.6651	0.6664	0.6667	0.6672	0.6649
(2)	$EFN_{winsorize}$ (lower bound 0; winsorized at 99%)	0.2235 (0.10)	1.7712 (0.71)	3.1337 (1.34)	3.1986 (1.27)	4.1436 (1.55)	**5.3122** (1.98)**	**6.0051** (2.20)**	**6.0641** (2.22)**	**6.3401** (2.24)**	**5.2279** (1.81)*
	winsorization level	0.87	0.83	0.84	0.79	0.79	0.79	0.79	0.79	0.79	0.79
	adjusted R^2	0.6606	0.6610	0.6621	0.6622	0.6630	0.6644	0.6653	0.6654	0.6656	0.6639
(3)	EFN_{full} (no lower or upper bound or winsorizing)	-0.5819* (1.67)	-0.6678 (1.63)	-0.5794 (1.37)	-0.5608 (1.30)	-0.5562 (1.29)	-0.5199 (1.18)	-0.5098 (1.15)	-0.5117 (1.16)	-0.5115 (1.15)	-0.5278 (1.20)
	adjusted R^2	0.6635	0.6635	0.6628	0.6626	0.6626	0.6623	0.6622	0.6623	0.6623	0.6624
(4)	$EFN_{-outcome}$(lower bound 0; winsorized at 99%)	**-0.0830*** (2.91)**	**-0.0821** (2.26)**	**-0.1040** (2.19)**	-0.1156* (1.95)	-0.1363* (1.92)	-0.1504* (1.84)	-0.1660* (1.86)	**-0.1920** (2.04)**	**-0.2001** (2.09)**	-0.1970* (1.79)
	winsorization level										
	adjusted R^2	0.6689	0.6678	0.6676	0.6671	0.6671	0.6668	0.6668	0.6672	0.6672	0.6667
Distribution of values of EFN_{full}											
	firms with $EFN_{full} \leq 0$	233 (16)	198 (9)	165 (10)	150 (7)	125 (8)	108 (6)	106 (5)	110 (3)	97 (4)	94 (5)
	firms with $0 < EFN_{full} \leq 0.5$	251 (92)	294 (119)	324 (138)	333 (133)	361 (123)	379 (122)	385 (115)	383 (116)	395 (103)	399 (100)
	firms w $0.5 < EFN_{full}$	41 (21)	33 (20)	36 (21)	42 (25)	39 (24)	38 (24)	34 (21)	32 (19)	33 (20)	32 (19)

Table 10A. Industry Effects (4-digit Industry Dummies)

Coefficients and *t*-values for 42 4-digit industry dummies from regressions similar to our base 4-digit regression (*Table 4*, regressions (5)). Industry 963 (Supporting and Auxiliary Transport Activities; Activities of Travel Agencies) is chosen as the omitted dummy because it has the median coefficient. We include in the regressions, but omit from the table, seven industries that include only one firm, for which we cannot separate industry from firm effects. Coefficients for industry 1165 (Financial Institutions, Except Insurance and Pension Funding) are from separate regressions that exclude bank dummy. *t*-values, based on White's heteroskedasticity-consistent standard errors, are reported in parentheses.

Industry Code	No. of firms	Description	Coefficient	t-value
1165	22	Full KIC 1165 (Financial Institutions, Except Insurance and Pension Funding), including banks (from regressions *excluding* bank dummy)	9.9502	1.64
428	7	Manufacture of Fabricated Metal Products, Except Machinery and Furniture	6.2341	1.46
433	7	Manufacture of Medical, Precision and Optical Instruments, Watches and Clocks	6.2065	1.27
432	43	Manufacture of Electronic Components, Radio, TV and Communication Equipment and Apparatuses	6.0624	1.40
436	4	Manufacture of Furniture; Manufacturing of Articles, etc.	5.9655	1.11
1374	3	Professional, Scientific and Technical Services	5.6595	1.15
419	5	Tanning and Dressing of Leather, Manufacture of Luggage and Footwear	5.0274	1.16
429	19	Manufacture of Other Machinery and Equipment	4.3821	0.98
751	22	Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles	3.8384	0.84
1164	3	Post and Telecommunications	3.7279	0.58
1372	2	Computer and Related Activities	3.1183	0.47
421	16	Manufacturing of Pulp, Paper, and Paper Products	2.3372	0.53
427	27	Manufacture of Basic Metals	2.1293	0.49
424	80	Manufacture of Chemicals and Chemical Products	1.8782	0.44
960	7	Land Transport; Transport Via Pipelines	1.7301	0.42
418	11	Manufacture of Sewn Wearing Apparel and Fur Articles	1.7078	0.38
434	23	Manufacture of Motor Vehicles, Trailers and Semi-trailers	1.6655	0.38
Subset of 1165	9	Subset of KIC 1165 (Financial Institutions, Except Insurance and Pension Funding), excluding banks (from regressions *including* bank dummy)	1.6349	0.29
540	10	Electricity, Gas, Steam and Hot Water Supply	1.4173	0.31
431	15	Manufacture of Electrical Machinery and Apparatuses, etc.	1.4093	0.31
1167	24	Activities Auxiliary to Financial Intermediation	0.7991	0.17
1166	9	Insurance and Pension Funding, Except Compulsory Social Security	0.3738	0.08
417	20	Manufacture of Textiles, Except Sewn Wearing apparel	0.2840	0.06
425	18	Manufacture of Rubber and Plastic Products	0.0182	0.00
963	2	Supporting and Auxiliary Transport Activities; Activities of Travel Agencies	Omitted	
430	4	Manufacture of Computers and Office Machinery	-0.1118	-0.02
645	25	General Construction	-0.4342	-0.10
426	20	Manufacture of Other Non-metallic Mineral Products	-0.6139	-0.14
752	6	Retail Trade, Except Motor Vehicles and Motorcycles	-0.9204	-0.23
423	5	Manufacture of Coke, Refined Petroleum Products and Nuclear Fuel	-1.0243	-0.19
435	5	Manufacture of Other Transport Equipment	-1.1210	-0.18
205	4	Fishing	-1.4509	-0.30
420	3	Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials	-1.9267	-0.46
415	29	Manufacture of Food Products and Beverages	-2.0484	-0.46
961	3	Water Transport	-5.9051	-1.32
standard deviation of industry coefficients			**3.13**	

Table 10B. Industry Effects (2-digit Industry Dummies)

This table reports coefficients and *t*-values for 2-digit industry dummies from regressions similar to *Table 11A,* except using 2-digit industries. Industry 4 (Manufacturing) is chosen as the omitted dummy because it has the median coefficient. We include the regressions, but omit from the table, four industries that include only one firm, for which we cannot separate industry from firm effects. Coefficients for industry 11 (Financial Institutions and Insurance) are from separate regressions that exclude bank dummy. *t*-values, based on White's heteroskedasticity-consistent standard errors, are reported in parentheses.

Industry Code	No. of firms	Description	Coefficient	*t*-value
10	3	Post and Telecommunications	2.2696	0.50
13	6	Business Activities	1.9907	0.66
11	55	Full KIC 11 (Financial Institutions and Insurance), including banks (from regressions *excluding* bank dummy)	1.8779	1.04
7	29	Wholesale and Retail Trade	0.9541	0.67
4	363	Manufacturing **(omitted)**	Omitted	
5	11	Electricity, Gas and Water Supply	-0.0917	-0.04
Subset of 11	42	Subset of KIC 11 (Financial Institutions and Insurance), *excluding* banks (from regressions *including* bank dummy)	-0.3739	-0.25
6	25	Construction	-1.5874	-0.97
12	2	Real Estate And Renting And Leasing	-2.0037	-0.66
9	13	Transport	-2.1873	-1.44
standard deviation of industry coefficients			**1.77**	

Table 11. Industry Growth and Profitability

Ordinary least squares regressions of Corporate Governance Index (*CGI*) on 8-year industry sales growth, profitability (net income/assets), and equity finance need. Regressions with 2-digit (4-digit) industry dummies use 4-digit (2-digit) sales growth, profitability and equity finance need. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. *t*-values, based on White's heteroskedasticity-consistent standard errors, are reported in parentheses. Significant results (at 5% level or better) are shown in **boldface**.

	Corporate Governance Index (*CGI*)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Industry Dummies	2-digit	4-digit	2-digit	4-digit	2-digit	4-digit	2-digit	4-digit
4-digit Industry Sales Growth	**21.7745*** (3.95)**		**21.8119*** (4.03)**				**16.3952** (2.40)**	
2-digit Industry Sales Growth		**52.2547*** (2.91)**		**73.9143*** (10.53)**				**51.9871*** (3.69)**
4-digit Industry Profitability			-34.6648 (1.50)					
2-digit Industry Profitability				-186.6623* (1.89)				
Firm Profitability	**-23.1250*** (2.92)**	**-21.5063** (2.58)**						
4-digit Industry *EFN*					**20.7943*** (2.79)**		12.3620 (1.43)	
2-digit Industry *EFN*						47.2332* (1.65)		45.1706* (1.89)
Ln(assets)	**2.0055*** (4.64)**	**2.2606*** (4.82)**	**1.9349*** (4.48)**	**2.1980*** (4.76)**	**2.0978*** (5.01)**	**2.2209*** (4.81)**	**1.9518*** (4.52)**	**2.1980*** (4.76)**
Asset Size Dummy	**15.4801*** (8.39)**	**15.2669*** (7.79)**	**15.4847*** (8.39)**	**15.3612*** (7.84)**	**14.8875*** (8.07)**	**15.4267*** (7.89)**	**15.2211*** (8.21)**	**15.3612*** (7.84)**
Bank Dummy	**19.9145*** (6.39)**	**18.2743*** (4.19)**	**19.9449*** (6.45)**	**17.9291*** (4.34)**	**17.9790*** (5.73)**	**17.8644*** (4.32)**	**18.9136*** (5.94)**	**17.9291*** (4.34)**
SOE Dummy	**9.0491*** (2.77)**	5.4704 (1.42)	**10.2023*** (3.11)**	6.7929* (1.75)	**8.8974*** (2.69)**	7.0073* (1.83)	**9.8786*** (3.01)**	6.7929* (1.75)
Chaebol Dummy	0.1544 (0.15)	-0.0488 (0.04)	0.5106 (0.51)	0.2507 (0.23)	0.7223 (0.71)	0.2671 (0.25)	0.6432 (0.63)	0.2507 (0.23)
Sole Ownership	0.1012 (1.62)	**0.1274** (2.02)**	0.0865 (1.39)	0.1115* (1.76)	0.0919 (1.46)	0.1105* (1.75)	0.0913 (1.46)	0.1115* (1.76)
Sole Ownership^2	-0.0015* (1.85)	**-0.0018** (2.05)**	-0.0013 (1.58)	-0.0015* (1.77)	-0.0014* (1.67)	-0.0015* (1.75)	-0.0014* (1.66)	-0.0015* (1.77)
Firm Risk	**65.7376*** (3.86)**	**61.5007*** (3.58)**	**83.3080*** (5.43)**	**80.1341*** (5.16)**	**88.8296*** (5.92)**	**80.1562*** (5.16)**	**83.4633*** (5.44)**	**80.1341*** (5.16)**
Leverage	**-1.0308*** (2.98)**	**-0.9135** (2.41)**	**-0.8952** (2.56)**	**-0.7922** (2.12)**	**-1.1700*** (3.39)**	**-0.7867** (2.11)**	**-0.9605*** (2.66)**	**-0.7922** (2.12)**
Market Share	4.8855 (1.44)	9.9162* (1.86)	4.7698 (1.38)	8.4602 (1.62)	6.1408* (1.68)	7.4000 (1.43)	5.2246 (1.55)	8.4602 (1.62)
Capex/Sales	4.6743 (0.99)	5.5952 (1.23)	4.4741 (0.99)	4.7869 (1.08)	4.7149 (1.05)	4.2878 (0.99)	3.3964 (0.78)	4.7869 (1.08)
Exports/Sales	1.5693 (1.37)	0.0827 (0.05)	1.4601 (1.28)	0.0430 (0.03)	0.8572 (0.71)	0.1187 (0.08)	1.0867 (0.91)	0.0430 (0.03)
Ln(listed years)	0.1239 (0.23)	0.1065 (0.19)	0.4305 (0.82)	0.4943 (0.89)	0.4894 (0.92)	0.4533 (0.82)	0.4858 (0.92)	0.4943 (0.89)
R&D/Sales	-1.5902 (0.51)	-3.1986 (1.26)	-1.1697 (0.39)	-2.9150 (1.21)	-0.9855 (0.31)	-2.8803 (1.19)	-1.4800 (0.50)	-2.9150 (1.21)
Advertising/Sales	11.2985 (0.62)	20.5886 (0.99)	11.3031 (0.62)	16.4143 (0.80)	7.0422 (0.39)	16.6128 (0.82)	10.1111 (0.56)	16.4143 (0.80)
PPE/Sales	**-1.4264** (2.40)**	-1.1155* (1.86)	**-1.3130** (2.20)**	-0.9420 (1.50)	**-1.4319** (2.52)**	-0.9184 (1.47)	**-1.1829** (2.04)**	-0.9420 (1.50)
Intercept Term	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample Size	519	519	524	524	524	524	524	524
Adjusted R^2	0.6551	0.6621	0.6514	0.6563	0.6492	0.6560	0.6518	0.6563

Table 12. Industry Growth and Profitability: Different Averaging Periods and Definitions

Ordinary least squares regressions similar to *Tables 5A-5B*, except substituting industry for firm growth and industry for firm profitability as shown. Regressions with 2-digit (4-digit) industry dummies use 4-digit (2-digit) industry averages. Other control variables are included in the regressions but are not shown. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. *t*-values, based on White's heteroskedasticity-consistent standard errors, are reported in parentheses. Significant results (at 5% level or better) are shown in **boldface**.

Set	Averaging Period	2-years	3-years	4-years	5-years	6-years	7-years	8-years	9-years	10-years
1	4-digit Industry Sales Growth	**9.5604*** **	7.3425	6.9938*	**8.6391*** **	**14.2296*** **	**18.1843*** **	**21.7745*** **	**23.4798*** **	**23.6043*** **
		(3.35)	(1.59)	(1.91)	**(3.64)**	**(4.77)**	**(4.88)**	**(3.95)**	**(3.30)**	**(2.96)**
	Firm Net Income/Assets	**-8.3264****	**-11.9998*** **	**-15.5206*** **	**-17.8394*** **	**-19.1206*** **	**-20.8421*** **	**-23.1250*** **	**-25.4684*** **	**-27.2521*** **
		(2.41)	**(3.32)**	**(3.27)**	**(3.37)**	**(3.08)**	**(2.89)**	**(2.92)**	**(2.94)**	**(2.92)**
	industry dummies	2-digit	2-digit	2-digit	2-digit	2-digit	2-digit	2-digit	2-digit	2-digit
	Adjusted R^2	0.6534	0.6503	0.6509	0.6535	0.6547	0.6557	0.6551	0.6542	0.6530
2	2-digit Industry Sales Growth	**37.5716*** **	**44.2293*** **	**51.5258*** **	**52.3086*** **	**51.3160*** **	**56.8538*** **	**52.2547*** **	**52.1182*** **	**58.7784*** **
		(6.16)	**(2.91)**	**(3.51)**	**(3.06)**	**(2.62)**	**(2.96)**	**(2.91)**	**(3.21)**	**(3.88)**
	Firm Net Income/Asset	**-6.0704***	**-9.6469*** **	**-13.1233*** **	**-15.0433*** **	**-16.7056****	**-19.0538****	**-21.5063****	**-23.5501*** **	**-25.4784*** **
		(1.73)	**(2.75)**	**(2.77)**	**(2.73)**	**(2.56)**	**(2.52)**	**(2.58)**	**(2.60)**	**(2.60)**
	industry dummies	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit
	Adjusted R^2	0.6601	0.6618	0.6625	0.6622	0.6618	0.6621	0.6621	0.6623	0.6625
3	4-digit Industry Asset Growth	**14.5670*** **	12.5637*	**12.3464****	**14.8407*** **	**18.9546*** **	**21.5870*** **	**23.5362*** **	**23.8959*** **	**24.1817*** **
		(3.24)	(1.89)	**(1.97)**	**(3.13)**	**(3.48)**	**(3.78)**	**(3.56)**	**(3.21)**	**(3.07)**
	Firm Ordinary Income/Assets	**-6.7515****	**-10.0266****	**-11.5532****	**-13.6614****	**-14.2250****	**-16.6200****	**-19.3498****	**-20.7231****	**-21.7036****
		(2.05)	**(2.23)**	**(2.15)**	**(2.20)**	**(2.05)**	**(2.11)**	**(2.27)**	**(2.33)**	**(2.36)**
	industry dummies	2-digit	2-digit	2-digit	2-digit	2-digit	2-digit	2-digit	2-digit	2-digit
	Adjusted R^2	0.6517	0.6487	0.6484	0.6521	0.6529	0.6543	0.6543	0.6533	0.6527
4	2-Digit Industry Asset Growth	26.2925	-4.0544	-4.9034	11.0368	21.7533	32.0549	39.7673	37.8088	40.8412
		(0.82)	(0.15)	(0.18)	(0.35)	(0.64)	(1.03)	(1.40)	(1.44)	(1.48)
	Firm Ordinary Income/Assets	-5.1564	-8.5572*	-10.5172*	**-12.4129****	**-13.9144****	**-17.0249****	**-19.8460****	**-21.0685****	**-22.1858****
		(1.48)	(1.93)	(1.95)	**(2.00)**	**(1.98)**	**(2.11)**	**(2.26)**	**(2.29)**	**(2.32)**
	industry dummies	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit
	Adjusted R^2	0.6585	0.6597	0.6597	0.6598	0.6600	0.6608	0.6615	0.6615	0.6616
5	4-digit Industry Sales Growth	**9.7844*** **	**10.8061****	**8.2197****	**8.7231*** **	**14.4116*** **	**18.1168*** **	**21.8119*** **	**23.7843*** **	**23.8023*** **
		(3.53)	**(2.34)**	**(2.22)**	**(3.85)**	**(4.66)**	**(4.64)**	**(4.03)**	**(3.47)**	**(3.07)**
	4-digit Industry Net Income/Assets	**-31.6289*** **	**-40.4824*** **	**-37.2239****	**-36.4315****	-35.0354*	-30.5222	-34.6648	-38.4992	-34.2213
		(2.61)	(3.07)	(2.56)	(2.11)	(1.78)	(1.38)	(1.50)	(1.59)	(1.31)
	industry dummies	2-digit	2-digit	2-digit	2-digit	2-digit	2-digit	2-digit	2-digit	2-digit
	Adjusted R^2	0.6538	0.6498	0.6481	0.6499	0.6513	0.6519	0.6514	0.6505	0.6490
6	2-digit Industry Sales Growth	**41.3910*** **	**33.3370****	**54.7855*** **	**62.2955*** **	**68.2717*** **	**72.1722*** **	**73.9143*** **	**71.5449*** **	**74.3449*** **
		(9.23)	(2.04)	(5.28)	(6.85)	(7.33)	(7.95)	(10.53)	(10.89)	(10.89)
	2-digit Industry Net Income/Assets	-115.5349	-402.6519*	-109.5996	-118.7916*	-142.6935**	-142.0735*	-186.6623*	-183.4341*	-159.3335
		(0.73)	(1.79)	(1.41)	(1.73)	(2.13)	(1.85)	(1.89)	(1.67)	(1.31)
	industry dummies	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit
	Adjusted R^2	0.6563	0.6563	0.6563	0.6563	0.6563	0.6563	0.6563	0.6563	0.6563

Table 13. Industry Variables Generally

Ordinary least squares regressions of *CGI* on industry sales growth, profitability (net income/assets), and equity finance need. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. *t*-values, based on White's heteroskedasticity-consistent standard errors, are reported in parentheses. Significant results (at 5% level or better) are shown in **boldface**.

	Corporate Governance Index (*CGI*)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Industry Averages based on	4-digit	4-digit	2-digit	2-digit	4-digit	2-digit	4-digit	2-digit
Industry Dummies	2-digit	No	4-digit	No	2-digit	4-digit	No	No
Ln(assets)	**1.4987*** **	**1.4529*** **	**1.6195*** **	**1.2159*** **	**2.0367*** **	**2.2511*** **	**2.0646*** **	**2.0150*** **
	(4.09)	**(4.08)**	**(4.23)**	**(3.16)**	**(4.58)**	**(4.85)**	**(4.77)**	**(4.68)**
Asset Size Dummy	**17.2790*** **	**17.5178*** **	**17.2653*** **	**17.4817*** **	**15.5204*** **	**15.2611*** **	**16.0591*** **	**15.6249*** **
	(9.81)	**(10.22)**	**(9.40)**	**(9.43)**	**(8.22)**	**(7.78)**	**(8.90)**	**(8.67)**
Bank Dummy	**19.3358*** **	**19.6424*** **	**15.9816*** **	**16.6386*** **	**20.5973*** **	**17.6540*** **	**20.6249*** **	**18.4333*** **
	(5.72)	**(6.15)**	**(3.69)**	**(5.13)**	**(6.36)**	**(3.99)**	**(6.74)**	**(6.25)**
SOE Dummy	**9.9679*** **	**10.7596*** **	**8.0221** **	**8.9761*** **	**7.9467** **	6.1931*	**9.9590*** **	**10.3066*** **
	(3.09)	**(3.66)**	**(2.22)**	**(2.95)**	**(2.39)**	(1.65)	**(3.49)**	**(3.50)**
Chaebol Dummy	0.6624	0.6014	0.5880	0.6783	0.1847	0.0013	0.0857	-0.0405
	(0.62)	(0.61)	(0.53)	(0.64)	(0.18)	(0.00)	(0.09)	(0.04)
Sole Ownership	0.0447	0.0469	0.0544	0.0290	0.1042*	0.1183*	0.1037*	0.0843
	(0.74)	(0.80)	(0.87)	(0.46)	(1.74)	(1.91)	(1.75)	(1.37)
Sole Ownership^2	-0.0006	-0.0005	-0.0007	-0.0006	-0.0014*	-0.0016*	-0.0014*	-0.0013
	(0.69)	(0.67)	(0.77)	(0.64)	(1.83)	(1.92)	(1.74)	(1.58)
Industry Sales Growth	18.4539*	**20.5032*** **		**31.0228** **	12.7722		16.3773*	23.1147
	(1.93)	**(2.82)**		**(2.25)**	(1.20)		(1.82)	(1.45)
Industry Profitability (net	-65.1273*	**-65.7685** **		-186.4185	-22.0112		-32.1671	-143.3308
income/assets)	(1.92)	**(2.24)**		(1.41)	(0.59)		(1.01)	(1.10)
Industry Asset Size	-1.3550	-0.4720	**3.8526*** **	-0.6525	-1.4347	**5.6391*** **	-0.9566	-1.1747
	(0.99)	(0.69)	**(5.28)**	(0.62)	(1.06)	**(4.21)**	(1.43)	(1.22)
Industry Risk	1.0652	33.9098		18.6176	-52.9528		-36.6050	-32.4786
	(0.02)	(0.96)		(0.22)	(0.84)		(0.93)	(0.38)
Industry Leverage	-0.5687	-1.3886*	**4.1379*** **	-2.7348*	0.3246	2.8194	-0.5119	-1.2256
	(0.56)	(1.73)	**(2.60)**	(1.82)	(0.31)	(1.17)	(0.60)	(0.75)
Market Concentration	3.6620	-0.7188			-3.8842		-4.6070	
	(0.77)	(0.24)			(0.63)		(1.06)	
Industry Capex/Sales	-0.0680	4.6372		0.0320	-4.0218		2.2908	-4.5189
	(0.01)	(0.64)		(0.00)	(0.34)		(0.28)	(0.19)
Industry Export/Sales	1.5463	1.8467		-4.5240	1.1526		1.7216	-5.0162
	(0.64)	(0.99)		(0.78)	(0.44)		(0.73)	(0.76)
Industry R&D/Sales	62.2984*	35.4343		-25.6379	**67.9224** **		39.1981	18.9425
	(1.78)	(1.10)		(0.11)	**(1.98)**		(1.24)	(0.08)
Industry Advertising/Sales	7.0616	-5.9803		249.5338	-55.0442		-47.8007	218.2537
	(0.14)	(0.17)		(1.03)	(1.00)		(1.17)	(0.91)
Industry PPE/Sales	-3.8744	-3.7140*	**8.8554*** **	-4.3406	-4.5355	**9.3281*** **	-3.1382	-2.6772
	(1.25)	(1.94)	**(10.28)**	(0.69)	(1.39)	**(6.57)**	(1.54)	(0.39)
Sales Growth					3.3285	3.7398	3.9028	**10.9682** **
					(0.67)	(0.75)	(0.78)	**(2.49)**
Net Income/Assets					**-22.6601*** **	**-23.9906*** **	**-23.7130*** **	**-30.7101*** **
					(2.83)	**(2.85)**	**(2.93)**	**(3.78)**
Leverage					**-0.8664** **	**-0.9309** **	**-0.8430** **	**-1.1078*** **
					(2.29)	**(2.44)**	**(2.24)**	**(3.14)**
Firm Risk					**62.2025*** **	**61.1595*** **	**60.7835*** **	**67.6256*** **
					(3.60)	**(3.58)**	**(3.55)**	**(4.02)**
Market Share					9.4158*	8.4374	5.4517	1.9926
					(1.83)	(1.50)	(1.42)	(0.66)
Capex/Sales					5.6765	5.0395	5.2719	5.5891
					(1.41)	(1.15)	(1.28)	(1.23)
Exports/Sales					0.2240	0.1285	0.2905	1.7082
					(0.15)	(0.08)	(0.20)	(1.48)
R&D/Sales					-3.3208	-3.1562	-3.2766	-1.0075
					(1.14)	(1.23)	(1.19)	(0.31)
Advertising/Sales					19.8491	21.8431	21.4949	12.1416
					(1.00)	(1.04)	(1.10)	(0.66)
PPE/Sales					-1.0338	-1.0303	-1.0696*	-1.2985*
					(1.59)	(1.59)	(1.66)	(1.92)
Intercept Term	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample Size	525	525	525	525	517	517	517	517
Adjusted R^2	0.6374	0.6414	0.6372	0.6043	0.6619	0.6627	0.6637	0.6524