Does Corporate Governance Predict Firms' Market Values? Evidence from Korea

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Abstract

We report strong OLS and instrumental variable evidence that an overall corporate governance index is an important and likely causal factor in explaining the market value of Korean public companies. We construct a corporate governance index (KCGI, 0~100) for 515 Korean companies based on a 2001 Korea Stock Exchange survey. In OLS, a worst-to-best change in KCGI predicts a 0.47 increase in Tobin's q (about a 160% increase in share price). This effect is statistically strong (t = 6.12) and robust to choice of market value variable (Tobin's q, market/book, and market/sales), specification of the governance index, and inclusion of extensive control variables. We rely on unique features of Korean legal rules to construct an instrument for KCGI. Good instruments are not available in other comparable studies. Two-stage and three-stage least squares coefficients are larger than OLS coefficients and are highly significant. Thus, this paper offers evidence consistent with a causal relationship between an overall governance index and higher share prices in emerging markets. We also find that Korean firms with 50% outside directors have 0.13 higher Tobin's q (roughly 40% higher share price), after controlling for the rest of KCGI. This effect, too, is likely causal. Thus, we report the first evidence consistent with greater board independence causally predicting higher share prices in emerging markets.

Keywords: Korea, corporate governance, corporate governance index, law and finance, firm valuation, board of directors, emerging markets

JEL Classifications: G32, G34

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Does Corporate Governance Predict Firms' Market Values? Evidence from Korea[†]

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Abstract: We report strong *OLS* and instrumental variable evidence that an overall corporate governance index is an important and likely causal factor in explaining the market value of Korean public companies. We construct a corporate governance index (*KCGI, 0~100*) for 515 Korean companies based on a 2001 Korea Stock Exchange survey. In *OLS*, a worst-to-best change in *KCGI* predicts a 0.47 increase in Tobin's *q* (about a 160% increase in share price). This effect is statistically strong (t = 6.12) and robust to choice of market value variable (Tobin's *q*, market/book, and market/sales), specification of the governance index, and inclusion of extensive control variables.

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We also find that Korean firms with 50% outside directors have 0.13 higher Tobin's *q* (roughly 40% higher share price), after controlling for the rest of *KCGI*. This effect, too, is likely causal. Thus, we report the first evidence consistent with greater board independence causally predicting higher share prices in emerging markets.

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Post-publication version. This version accompanies a replication dataset and replication statistical code (in Stata). In the course of replication, we found several instances where we could not fully replicate the published version; these are noted below. Changes from the original are marked. These instances do not affect the core results of the paper. Most affect *t*-statistics, rather than coefficients, in most of these instances, the *t*-statistics are higher than originally reported).

Links: Stata 11 dataset: http://ssrn.com/abstract=2094774 [please cite as: Replication dataset (Stata 11) for Bernard Black, Hasung Jang, and Woochan Kim, *Does Corporate Governance Affect Firms' Market Values? Evidence from Korea*, 22 **Journal of Law, Economics and Organization** 366-413 (2006) (post-publication version at http://ssrn.com/abstract=311275)], dataset at http://ssrn.com/abstract=2094774

Statistical code: Stata 11 do file available at http://ssrn.com/abstract=2094775 [please cite as: Replication statistical code (Stata 11) for Bernard Black, Hasung Jang, and Woochan Kim, *Does Corporate Governance Affect Firms' Market Values? Evidence from Korea*, 22 **Journal of Law, Economics and Organization** 366-413 (2006) (post-publication version at http://ssrn.com/abstract=311275)], statistical code at http://ssrn.com/abstract=2094775

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1. Introduction

Corporate governance legal reforms and voluntary corporate governance codes are proliferating around the world. The overall effect of corporate governance on firm value or performance, however, remains unclear. This paper employs an in-depth study of Korea to offer both OLS and instrumental variable evidence, not previously available in any country, consistent with overall governance causally predicting higher share prices.

Investor protection at the *country level* correlates with larger securities markets, less concentrated share ownership, and higher share prices (a higher value for minority shares) (e.g., La Porta, Lopez-de-Silanes and Shleifer, 2005, Levine, 1998). A separate question, and the focus of this paper, is whether the corporate governance practices of firms *within a single country* affects these firms' share prices. To what extent can a firm increase its market value by upgrading its corporate governance practices, and to what extent is it tied to its home country's rules and reputation?

Even if firm-level governance correlates with share prices in *OLS*, it is unclear whether this relationship is causal. First, firms with high market values may adopt good governance practices, rather than vice versa (*reverse causation*). Second, firms may endogenously choose different governance practices (Demsetz and Lehn, 1985) (*optimal differences*). Third, firms may adopt good governance rules to *signal* that the firm's insiders will behave well, but the signal, not the firm's governance practices, affects share prices. A fourth concern is *omitted variable bias*. A study that omits economic variables, which predict both governance and share price, could wrongly conclude that governance directly predicts share price.

Prior research on the relation between overall firm governance and firms' market values or performance does not effectively address any of these concerns. In particular, prior work (e.g., Black, 2001, Gompers, Ishii and Metrick, 2003, and Durnev and Kim, 2005) lacks effective instruments with which to address endogeneity.

We construct and test a comprehensive corporate governance index (*KCGI*, 0~100) for a sample of 515 Korean companies, essentially the universe of publicly traded Korean firms. Unique features of Korea's corporate governance rules let us construct an instrument for our governance index. Several important Korean rules apply only to firms with assets of at least 2 trillion won (roughly US$2 billion). We call these firms "large" and other firms "small." This exogenous variation in legal rules lets us use an asset size dummy at 2 trillion won to instrument for our governance index. We use regression discontinuity analysis, adapted from labor economics (Angrist and Lavy, 1999), to control for the direct effect of firm size on Tobin's *q* (our principal measure of firm market value). Our results are similar in *OLS* and two-stage least squares (*2SLS*) regressions, with larger coefficients in *2SLS*. These results are consistent with causation running from good governance to higher market value.

Our results are economically important. In *OLS*, a worst-to-best change in *KCGI* predicts a 0.47 increase in Tobin's *q* (roughly a 160% increase in share price). They are robust to use of an extensive set of control variables, choice of market value variable, and specification of the governance index. The predictive power of our index comes from the overall effect of multiple governance elements, rather than the power of a few strong elements.

Second, we find a strong connection between board composition and share price. Korean firms with 50% outside directors have 0.13 higher predicted Tobin's *q* (roughly 40% higher share price), after controlling for the rest of our governance index.. This effect exists both for firms that voluntary choose 50% outside boards and for large firms, which are required by law to have 50% outside directors, so it cannot be explained by endogenous firm choice. This result is highly policy-relevant. Board independence is at the core of many corporate governance reforms, in both developed and emerging markets. Yet in developed countries, the dominant evidence suggests either no or even a *negative* correlation between board independence and Tobin's *q* (e.g., Bhagat and Black, 2002, Palia, 2001). Our results suggest that outside directors

may play an important role in emerging markets, where other controls on insider self-dealing are weaker.

We do not find strong evidence that better governed firms are more profitable or pay higher dividends. Instead, investors appear to value the same earnings or the same current dividends more highly for better-governed firms. In effect, better-governed firms appear to enjoy a lower cost of capital.

Share prices are the trading prices for minority shares. Our study cannot show whether higher share prices reflect higher value for all shareholders, lower private benefits enjoyed by controlling shareholders, or a combination of both effects. Put differently, we cannot test whether we have found an out-of-equilibrium situation, in which firms can increase firm value through governance changes, or an equilibrium situation in which firm value is maximized and gains to outside shareholders come at controlling shareholders' expense. We study in related work the factors that predict Korean firms' corporate governance choices (Black, Jang and Kim, 2005).

This paper is organized as follows. *Part 2* reviews the literature on the relationship between firm-level corporate governance and firm value. *Part 3* describes our data set and how we construct our governance index. *Part 4* discusses our *OLS* results. Parts 5 and 6 develop our instrumental variable results. *Part 7* addresses whether better-governed firms have higher market values because they are more profitable or because investors value the same profits more highly. *Part 8* presents results for control variables, subindices, individual elements of our overall governance index, and board composition. *Part 9* concludes.

2. Related Literature

A. Within-Country Variation in Corporate Governance

This paper addresses whether firm-level variation in *overall* corporate governance practices affects firms' market value. A large literature studies the link between corporate governance

and firms' market value or performance. However, most of this literature focuses on developed countries and on *particular aspects of governance*, such as board composition, shareholder activism, executive compensation, Delaware corporate law, insider share ownership, or takeover defenses. There is much more limited work that assesses whether *overall corporate governance* predicts firms' market value or performance is limited. The most closely related papers are Black (2001), Durnev and Kim (2005), Gompers, Ishii and Metrick (2003), and Klapper and Love (2004). These studies all have important limitations. Most centrally, none has a good way to control for endogeneity or signaling. Black finds a strong correlation between a governance index and the share prices of Russian firms. However, he has a small sample of 21 large firms and minimal control variables. Also, his results may not generalize beyond Russia, with its notably poor country-level governance.

Gompers, Ishii and Metrick study takeover defenses for U.S. firms. They report evidence that the decile of firms with the strongest takeover defenses have lower share prices than the decile with the weakest defenses. In most of the world, however, hostile takeovers are rare, and other aspects of governance are more salient.

Durnev and Kim (2005) use a multicountry approach to assess whether governance choices predict firms' market value. Durnev and Kim find that higher scores on both the *CLSA* corporate governance index and the *S&P* disclosure index predict higher Tobin's *q* for a sample of 859 large firms in 27 countries. However, their results are barely significant (*p* values of 0.04 to 0.06 depending on the governance index). Also, as we discuss below, the *CLSA* and S&P indices have important limitations. Klapper and Love (2004) also rely on the *CLSA* index.

Durnev and Kim is the only comparison paper to attempt an instrumental variable analysis. However, their instruments are suspect. They assume that industry does not affect governance. In contrast, both we, in separate research (Black, Jang and Kim, 2005), 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).

The principal differences between this paper and the related research noted above are as follows. First, we exploit unique features of Korea's governance rules to construct a plausible instrument for our governance index. Second, we find a strong connection between board composition (whether a firm has 50% outside directors) and share price.

Third, we evaluate possible causes of the correlation between corporate governance and firm market value. We do not find evidence that better governed firms are more profitable or pay higher dividends (for a given level of profits). Instead, investors appear to value the same earnings (or the same current dividends) more highly for better-governed firms. In effect, better-governed firms have a lower cost of capital. Fourth, *KCGI* is comprised of five subindices, for shareholder rights, board structure, board procedure, disclosure, and ownership parity. We assess the importance of each subindex and individual governance elements. Fifth, good data availability in Korea lets us employ extensive control variables. In equilibrium, corporate governance likely correlates with economic variables (Himmelberg, Hubbard, and Palia, 1999). This makes extensive control variables important to reduce omitted variable bias. Finally, the multicountry CLSA and S&P indices are available mostly for the largest firms in each country. In contrast, we study essentially all Korean public firms, both large and small.

B. Other Related Research

Two related bodies of research should be mentioned. One studies the effect of decisions by firms in emerging markets to cross-list their shares on major world exchanges. Cross-listing generally predicts an increase in share price. An important driver of this increase appears to be compliance by cross-listed companies with stricter disclosure rules (e.g., Lang, Lins and Miller, 2003; Doidge, Karolyi and Stulz, 2004; Reese and Weisbach, 2003). Cross-listing studies differ from our study in several respects. First, they assess the effect of borrowing another country's

rules wholesale, rather than the effect of firm-specific governance choices, in the context of local rules and enforcement. Second, cross-listing primarily involves the large firms. In contrast, we study both large and small Korean firms. Third, cross-listing is voluntary, which raises selection bias issues. Econometric procedures to address this bias are imperfect. Fourth, cross-listing mostly involves additional disclosure, which is only one aspect of governance.

A second body of research studies how firms fared in the 1997-1998 East Asian financial crisis. These studies use an exogenous shock (the Asian financial crisis) to investigate how out-of-equilibrium share prices are affected by disclosure and ownership. Mitton (2002) studies the relationship between disclosure and crisis-period stock returns. Lemmon and Lins (2003) study the relationship between ownership and crisis-period stock returns. Baek, Kang and Park (2004) study both ownership and disclosure effects.

These papers are similar in spirit to this paper in their use of an exogenous factor (the financial crisis) to address causality issues. However, they differ from this study in several respects. First, none studies a comprehensive governance index. Second, they address the relationship between governance and share prices only during the crisis period. Their dependent variable is crisis-period stock returns. This treats pre-crisis prices as an (implicitly governance-independent) baseline. Third, these papers study an out-of-equilibrium response to an economic shock. In contrast, we study the longer-term relationship between governance and firm market value, and are agnostic on whether the relationship is equilibrium (firm value is maximized although share price is not) or out-of-equilibrium (firms could raise their total value to all shareholders by improving their governance).

3. Data and Construction of Corporate Governance Index

We construct a Korean Corporate Governance Index (*KCGI*) based primarily on a spring 2001 survey of corporate governance practices by the Korea Stock Exchange (*KSE*), supplemented by hand collection of data for some governance elements. An English translation

of the survey is available from the authors. *Table 1* describes each governance element and provides summary statistics.

<< Place Table 1 about here>>

The *KSE* sent the survey to all listed companies. The response rate was very high: 540 of the 560 surveyed companies responded. The reliability of the responses should also be high because the *KSE* has quasi-regulatory authority over listed companies. We exclude 5 banks that were wholly owned by the government and one firm that was acquired soon after the survey was completed, leaving a sample of 534 surveyed firms. We can determine ownership parity, and thus complete our governance index, for 525 firms. Data availability for control variables limits our full-sample regressions to 515 firms.

We take balance sheet, income statement, and industry 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; stock market and share ownership data from a *KSE* database; information on *ADRs* from JP Morgan and Citibank websites; and industry classifications from the Korea Statistics Office. *Table 2* defines and provides basic information for each control variable. *Table 3B* provides summary statistics.

<< Place Table 2 about here>>

We extract 123 variables from the survey questions. We exclude questions that are subjective (they ask for management's opinions and future plans); lack clear relevance to corporate governance; are ambiguous as to which answer indicates better governance; had minimal variation between firms; overlap highly with another variable; or had few responses. This leaves us with 38 usable elements.

We classify these variables into four subindices: Shareholder Rights (5 elements); Board Structure (4 elements on board structure and composition); Board Procedure (26 elements); and Disclosure (3 elements). We add a fifth Ownership Parity subindex, which measures the extent

to which the largest shareholder controls more votes than the shareholder directly owns, a pattern which can increase a controlling shareholder's incentives to engage in self-dealing (e.g., Bebchuk, Kraakman, and Triantis, 2000). Ownership parity is defined as 1 - *ownership disparity*, with ownership disparity defined as (ownership by all affiliated shareholders) - (direct ownership by the largest shareholder).[1] Claessens Djankov, Fan and Lang (2002), Joh (2003), and others use a variable similar to ownership disparity, sometimes called "wedge." 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.

We lack a theoretical basis to assign weights to subindices or to elements within subindices. We therefore combine elements into subindices, and combine subindices into an overall index (*KCGI*), as follows. 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 ownership parity by 20. Thus, each subindex has a value between 0 and 20. We define *KCGI* (0~100) as the sum of the subindices; better-governed firms have higher scores.

In robustness checks for possible bias due to missing responses, we obtain similar results if we treat missing values as zero or exclude entirely the four elements of Board Procedure Subindex with response rates less than 75%. Also, firms that answer a higher percentage of questions tend to have higher KCGI scores (correlation between percentage of questions answered and *KCGI* = 0.62). This is not what one would expect if firms omitted answers to questions on which they would receive a low score.

[1] The largest shareholder is the shareholder that, together with its related parties, holds the largest number of shares. Related parties include relatives, affiliated firms, and company directors. The largest shareholder can be an individual or a firm. One can imagine alternate ownership measures that more directly capture the direct economic stake of the controlling individual or family, but these are not feasible to implement with the available data.

<< Place Table 3A-B about here>>

Table 3A provides summary statistics for *KCGI* and each subindex. The index mean (median) is 32.63 (29.87); the minimum is 12.73, and the maximum is 86.93. *Figure 1* shows a histogram of *KCGI*. A normal distribution curve is superimposed. The distribution is skewed to the right (skewness coefficient = 1.56). *Table 3C* provides a correlation table for *KCGI*, each subindex, and asset size dummy. All correlations are positive; almost all are significant.

We follow the common practice of using Tobin's *q* (estimated as (market value of common stock + book value of preferred stock + book value of debt)/book value of assets)) as our principal measure of firm market value. Korean accounting requires regular updating of the value of tangible assets to current market value; so book value of assets should not differ greatly from replacement cost for most firms. We run robustness checks with two alternative measures, market/book ratio (market value of common stock/book value of common stock) and market/sales ratio (market value of assets/sales).

The sample mean for Tobin's *q* is only 0.85. This low value could reflect overinvestment (for supporting evidence, see Joh (2003)), controlling shareholders enjoying private benefits of control, producing a "Korea discount" in the price of minority shares (for supporting evidence, see Bae, Kang and Kim, 2002, and Dyck and Zingales, 2004), or both. These explanations correspond to different ways in which stronger corporate governance could increase firms' market prices: by reducing overinvestment or restricting tunneling.

<< Place Table 3C about here>>

4. Corporate Governance and Firm Value: *OLS* Results

This part presents our *OLS* results. A qualitative picture first: *Figure 2* shows a scatter plots for Tobin's q versus *KCGI*. There is a visually obvious correlation (r = 0.34, slope coefficient = .0059, t = 8.23 with robust standard errors, 8.19 without them).

<< Place Figure 2 about here>>

A. Whole Sample Results for KCGI

An important risk in this and other corporate governance studies is misspecification of the equation used to estimate the coefficient on the independent variable of interest (here *KCGI*). As Himmelberg, Hubbard and Palia (1999) stress, a wide variety of economic factors likely affect both firm-value and firm governance. We include a comprehensive set of control variables to reduce omitted variable bias, as well as the likelihood that our results are affected by optimal differences endogeneity, in which different firms optimally choose different governance. Extensive control variables, made possible by good data availability in Korea, are an important strength of our study, compared to the multicountry studies discussed in *Part 2*. We discuss in *Part 8* the rationale for each control variable, results for control variables, and results for other control variables that we consider in robustness checks.

Nonetheless, firm heterogeneity that is not captured by our control variables could correlate with both Tobin's *q* and *KCGI* and affect our results. One response to this risk is to use panel data in a firm-fixed-effects model (e.g., Himmelberg, Hubbard and Palia, 1999, Palia, 2001). We cannot implement this approach because we have only cross-sectional data on *KCGI*. We plan to do so in future work that relies on future iterations of the *KSE* survey.

In *Table 4*, we regress Tobin's *q* against *KCGI*, industry dummies and control variables. We progressively add additional control variables in regressions (1-4). Below, we refer to regression (4) as our *base OLS regression*. *KCGI* is highly significant in each regression (coefficient = .0064, t = 6.12).[2] Adding control variables has only a small effect on the coefficient on *KCGI*. A moderate 10-point increase in *KCGI* predicts a 0.064 increase in Tobin's *q*. A worst-to-best change in *KCGI* predicts a 0.47 increase in Tobin's *q*, compared to a

[2] We refer to results as marginally significant, significant, and highly significant if they differ from zero at the 90%, 95%, and 99% confidence levels, respectively, using a two-tail test.

sample mean of 0.85. This is a 160% increase in share price, for a firm with Tobin's *q* and debt/assets equal to the sample means.

<< Place Table 4 about here>>

In *Table 4*, we treat observations as outliers and drop them from the sample if a studentized residual obtained by regressing Tobin′s *q* on *KCGI* and a constant term exceeds ±1.96. This method identifies 20 outliers, leaving a final sample of 495 firms. We obtain similar results if we include outliers (coefficient on *KCGI* = .0077, *t* = 5.29).

Robustness checks. *Table 4*, regressions (5)-(6) show that these results are robust if we use market/book ratio or market/sales ratio as the dependent variable instead of Tobin's *q*. A 10-point increase in *KCGI* predicts a 0.131 increase in market/book ratio (*t* = 4.70), and a 0.123 increase in market/sales ratio (*t* = 4.73). We also obtain similar results if we use a logarithmic transformation or a quantile transformation of the dependent variable.

B. Subsample Results

In *Table 5*, we test robustness by rerunning our base *OLS* regression for various subsamples:

- non-banks and non-financial, non-regulated firms (we have too few degrees of freedom to run a similar regression for banks or for financial and regulated firms)
- firms within the top 30 *chaebol* (diversified, family-controlled, Korean industrial groups) versus non-*chaebol* firms
- smallest quintile of firms, other small firms, and large firms
- non-manufacturing versus manufacturing firms
- more versus less profitable firms, based on return on assets (we get similar results for subsamples based on return on equity, and if we divide the sample into quartiles)

Our choice of subsamples deserves explanation. The governance practices of Korean firms are partly dictated by law. Some important rules apply only to large firms, banks, or firms within the top 30 *chaebol*. We discuss these rules in *Part 5.B*. The connection between these

firm characteristics and law-driven governance creates the possibility that the correlation between *KCGI* and Tobin's *q* may be spurious. If firm size (or bank or *chaebol* membership) correlates with Tobin's *q*, one would expect a correlation between *KCGI* and Tobin's *q* even when there is no causal link between the two. In our base *OLS* regression, we therefore include control variables for *ln*(assets), bank status, and *chaebol* membership. Rerunning our base *OLS* regression on subsamples provides a further check on whether the correlation between *KCGI* and Tobin's *q* is explained by these partly regulatory variables.

In *Table 5*, *KCGI* is an important factor explaining Tobin's *q* in all subsamples except the smallest firms (row 8). These firms aside, the coefficient on *KCGI* is similar in all subsamples, varying only from .0045 to .0068. *t*-statistics are above 3 for all subsamples except large firms (t = 2.01), for which significance is limited due to small sample size (62 firms), coupled with extensive control variables that reduce degrees of freedom. The similar coefficients for subsamples provide evidence against the optimal differences flavor of endogeneity. The last two columns of *Table 5* show robustness checks with market/book and market/sales as dependent variables; results are similar to those with Tobin's *q* as dependent variable.

KCGI has no predictive value for the smallest quintile of firms. This may be because these firms are thinly traded and investors do not pay attention to their governance. These firms account for only 1.3% of KSE market capitalization.

<< Place Table 5 about here>>

5. Corporate Governance and Firm Value: Instrumental Variable Results

A. Endogeneity and Signaling: Preliminary Comments

A recurring issue in studies of firm-level corporate governance is the potential for results to be explained by quality signaling, by reverse causation or by optimal differences. In a signaling story, firms signal high quality by adopting good governance rules, but it is the signal, not the governance rules, that affects firm value. For example, firms may add outside directors to

signal the insiders' intent to treat outside shareholders fairly, even though outside directors in fact don't affect insiders' behavior. Governance will then correlate with Tobin's *q*, but with no causal connection. Instead, governance will proxy for an omitted variable (the insiders' intent).

In the reverse causation flavor of endogeneity, firms with high Tobin's *q* choose good governance rules (presumably because this further enhances their market value). There will then be a causal connection between governance and firm value, but the *OLS* coefficient will overstate the connection. In the optimal differences flavor of endogeneity, different firms optimally choose different governance structures. For example, firms with high Tobin's *q* may need different governance structures than other firms. In this case, there will be a causal connection between governance and Tobin's *q* for some firms, but the *OLS* coefficient will overstate the connection and there will be no similar connection for other firms. Mixed signaling/endogeneity stories are also possible.

There is evidence of endogeneity in other corporate governance studies. Hermalin and Weisbach (1998) discuss endogeneity issues for board composition. Durnev and Kim (2005) develop a model in which a firm's choice of corporate governance is endogenously related to investment opportunities, need for external financing, and inside ownership. Himmelberg, Hubbard and Palia (1999) discuss the importance of unobserved firm characteristics in explaining the correlation between insider share ownership and Tobin's *q*. Bhagat and Black (2002) report evidence of reverse causation for board composition. Gillan, Hartzell and Starks (2003) test a reverse causation model in which Tobin's *q* predicts governance for U.S. firms.

In our *OLS* results, presented above, we address possible endogeneity in several ways. First, extensive control variables make optimal differences less likely to be important. Much of the variation between firms that could affect optimal governance should be captured by our control variables. Second, we verify robustness for subsamples. If the correlation between

governance and Tobin's *q* is robust across subsamples with different economic characteristics, this makes an optimal differences story less likely.

Still, endogeneity and signaling stories remain possible. Standard econometric procedures for addressing endogeneity require an instrument for the potentially endogenous variable (here, *KCGI*). An ideal instrument should be exogenous and not influenced by the dependent variable of interest (here Tobin's *q*). It should be correlated (preferably strongly to preserve regression power), with *KCGI*. And it should predict Tobin's *q* only *indirectly*, through its effect on *KCGI*, not directly. Other governance studies lack a plausible instrument.

A core contribution of this paper is that we use unique features of Korea's corporate governance rules to construct a reasonably strong instrument for *KCGI* -- an asset size dummy at 2 trillion won. In this *Part* 5, we discuss the legal rules underlying this instrument (section *B*) explain why it is plausible (section *C*), report our instrumental variable results (section *D*), and discuss the Durbin-Wu-Hausman test for endogeneity (section *E*). We then return in *Part* 6 to a more detailed assessment of asset size dummy as an instrument for *KCGI*.

B. Principal Legal Rules Affecting Corporate Governance

Our asset size dummy instrument depends on the differences between legal rules that apply to large firms (assets > 2 trillion won) versus small firms. We therefore discuss the relevant rules with some care.

Large versus small firms. Under 1999 amendments to the *Securities and Exchange Act*, effective in mid-2000, large firms must have at least three outside directors and at least 50% outside directors, an audit committee with at least 2/3 outside members and an outside chair, and an outside director nominating committee. Small firms must have 25% outside directors, but do not need an audit committee or an outside director nominating committee. Under 2001 amendments to the *Securities and Exchange Act*, effective in mid-2001 (after the time of our

study), large firms need board approval for a related party transaction that exceeds 1% of assets or sales. Approval is by the entire board, including inside directors.

Former State-Owned Enterprises. Under the 1997 *State Owned Enterprise Management Improvement and Privatization Act*, former state-owned enterprises (*SOEs*) must have at least 50% outside directors, and comply with special procedural rules, but are exempt from the audit committee and outside director nominating committee rules that apply to other large firms.

Banks. Under the *Banking Act*, banks (13 firms in our sample, of which 11 are large) must comply with the same outside director and audit committee rules as large firms, face special director nomination rules, but are exempt from the outside director nominating committee rule.

Chaebol. Under 1999 amendments to The *Monopoly Regulation and Fair Trade Act*, board approval is required for a related-party transaction by a firm within the top-30 *chaebol* if transaction size is greater than 10% of equity capital or 10 billion won.

C. Asset Size Dummy as Instrument for KCGI and Board Structure

If the portion of *KCGI* that is due to the rules governing large firms predicts higher Tobin's *q*, this cannot reflect signaling or endogeneity. We therefore use an asset size dummy at 2 trillion won (1 for large firms; 0 for small firms) as an instrument for *KCGI*. A problem with this instrument is that firm size can directly affect Tobin's *q*. To address this concern, we employ regression discontinuity analysis, adapted from labor economics (Angrist and Lavy, 1999; Angrist and Krueger, 1999). The idea behind regression discontinuity analysis is to use a smooth parametric form to capture the direct effect of firm size on Tobin's *q*. This lets the asset size dummy capture the discontinuous effect of size on governance at 2 trillion won. We use *ln*(assets) as a simple parametric form for firm size which hopefully captures the direct connection between firm size and Tobin's *q*. In robustness checks, we use a highly flexible form -- the first six powers of ln(assets) -- with similar results.

Figures 3 and 4 illustrate the regression discontinuity approach. *Figure 3* presents a scatter plot of *ln*(assets) versus *KCGI*, plus a regression line that we allow to "jump" at 2 trillion won, but not to change slope. We observe both a positive slope and a 9.3 point jump at 2 trillion won. The jump would be larger if we allowed the regression line to change slope at 2 trillion won. Visually, below 2 trillion won, there are many firms with low values of *KCGI*. Above 2 trillion won, the lowest *KCGI* score is 30.8. Legal rules set a floor level for permissible governance. *Figure 3* also shows the strong correlation between ln(assets) and *KCGI* (r = 0.65). This correlation will increase estimation error (reduce the *t*-statistic) for both variables in an *OLS* regression of Tobin's *q* on *KCGI*, *ln*(assets), and other control variables, but should not bias the coefficients. Similarly, the 0.73 correlation between *ln*(assets) and asset size dummy will increase estimation error but should not bias the coefficient on instrumented-*KCGI* in *2SLS*.

Figure 4 presents a scatter plot of asset size dummy versus Tobin's *q*, plus a regression line that we allow both to jump and change slope at 2 trillion won. The slope is negative for both small firms and large firms, consistent with an overall negative relationship between firm size and Tobin's *q*. There is an 0.43 jump at 2 trillion won. If we constrain the regression lines to have the same slope, we get similar results with a smaller 0.20 jump at 2 trillion won.

<< Place Figure 3 and Figure 4 about here>>

Exogeneity. The effect on governance of the legal requirements that apply to large firms can be safely said to be exogenous. First, we confirm that the threshold predicts a large change in firm behavior. As *Table 6* shows, almost all large firms have 50% outside directors, an audit committee, or an outside director nominating committee, versus very few small firms. Among large firms, 97% have 50% outside directors, 91% have audit committees, and 78% have outside

director nomination committees,[3] versus 4%, 7% and 7%for small firms. To address whether the 2 trillion won threshold proxies for a size level at which firms voluntarily adopt these board structures, we verify that in 1999, before the rules were adopted, only 3 former SOEs, for whom 50% outside directors were legally required) and 5 banks had 50% outside directors. No firms had an audit committee or an outside director nominating committee.

We also do not find evidence that firms manipulate their size to stay under the 2 trillion won threshold. Qualitatively, one can see in *Figure 3* that the density of firms is roughly the same just above as just below this level. We are not aware of news stories or other anecdotes suggesting that firms sell or spin off assets or restrain growth, to remain under the threshold.[4]

<< Place Table 6 about here>>

Correlation. As *Table III, Panel C* shows, asset size dummy correlates strongly with *KCGI* (r = 0.73) and with all subindices except Ownership Parity Subindex. Board Structure Subindex contains the rules directly affected by asset size dummy, and thus has the strongest correlation with asset size dummy (r = 0.87). We address in *Part 6* some interpretation issues that arise because asset size dummy predicts Board Structure more strongly than the rest of *KCGI*.

Functional form for direct effect of firm size on Tobin's q. The toughest question for instrument validity is whether asset size dummy predicts Tobin's *q* indirectly, through *KCGI*, and not directly. If *ln*(assets) is not the correct functional form for the direct effect of firm size on Tobin's *q*, then the power of asset size dummy could reflect a direct effect of asset size on Tobin's

[3] Reasons for less than 100% compliance are (i) the firm recently crossed the threshold; (ii) former *SOEs* are exempt from the audit committee requirement; and (iii) former *SOEs* and financial firms are exempt from the outside director nominating committee requirement.

[4] Size manipulation is unlikely for several reasons. First, the large firm rules were adopted quite recently. For most firms, size (large versus small) was already determined. Second, the rules are mild enough so that firms seem unlikely to limit growth or alter corporate structure to avoid them. Third, a similar number of firms have size just below and just above the threshold. For example, 3 firms have 1.9-2 trillion won in assets, versus 2 firms with 2.0-2.1 trillion won.

q, rather than the effect of asset size dummy on *KCGI*, which then predicts Tobin's *q*. We discuss below reasons to believe that this is not a large risk.

To begin with, *ln*(assets) has a strong *negative* correlation with Tobin's *q*, both in *OLS* and in the second stage of *2SLS*. This suggests that the *positive* correlation between asset size dummy and Tobin's *q* reflects the effect of asset size dummy on *KCGI*, which in turn affects Tobin's *q*, rather than a direct effect of asset size dummy on Tobin's *q*. Ln(assets) also takes a negative coefficient for both small firms and large firms (see *Table 5, regressions (6-8)* and *Figure 4*). It would stretch coincidence rather far to posit a negative relationship between firm size and Tobin's *q* for firms with assets less than 2 trillion won, which reverses sign at precisely the point (2 trillion won) where stronger corporate governance rules kick in, and again becomes negative above this point.

Still, asset size dummy could proxy for higher-order terms in the functional form. We address this risk by running our *2SLS* regressions controlling for ln(assets) control and again with a linear combination of the first six powers of ln(assets), with similar results. *Figure 5* also provides a scatter plot that shows a solid ln(assets) regression line, with slope taken from our base *OLS* regression, and a dotted 6-powers-of-ln(assets) fitted line, from a similar regression with 6 powers of ln(assets). The fitted line shows some nonlinearity in the relationship between firm size and Tobin's *q*, mostly for the smallest firms. But there is no change around 2 trillion won in the overall relationship between firm size and Tobin's *q*.

<< Place Figure 5 about here>>

Does asset size dummy predict KCGI where it should? We also confirm that asset size dummy predicts higher *KCGI* for the subindices where it should, given the relevant legal rules, while other size dummies lack similar power. In *Table 7*, we regress *KCGI* and each subindex on our usual control variables plus seven asset size subdummy variables, defined as follows:

- subdummy 1 = 1 if *ln*(assets) > 3.6 (assets > 37 billion won); 0 otherwise
- subdummy 2 = 1 if *ln*(assets) > 4.6 (assets > 99 billion won); 0 otherwise
- etc. for subdummy 3 through subdummy 7.

We expect to observe a significant coefficient on *subdummy 5* (which corresponds to our asset size dummy at 2 trillion won) for *KCGI*, Board Structure Subindex (which contains the rules directly affected by firm size), and (perhaps) Board Procedure Subindex, because firms that change board structure may also change board procedures. Other subdummies should have no consistent effect on *KCGI* or subindices, and subdummy 5 should not significantly affect other subindices. This is what we observe. Subdummy 5 takes large, highly significant coefficients with *KCGI* and Board Structure Subindex as dependent variables, a smaller but significant positive coefficient for Board Procedure Subindex, and insignificant coefficients for other subindices. Other subdummies are insignificant and more often negative than positive.

In *Table 7*, regression (8), we regress Tobin's *q* on all control variables from our base *OLS* regression, all asset subdummies, and 6 powers of *ln*(assets). The coefficient on KCGI is only slightly affected, which confirms that our *OLS* results are not sensitive to the functional form for firm size. The coefficient on subdummy 5 is small and insignificant, consistent with asset size dummy predicts Tobin's *q* indirectly through *KCGI*, rather than directly.

<< Place Table 7 about here>>

Historical relationship between asset size dummy and Tobin's q.. The governance rules that affect large firms were adopted in 1999. As a check on instrument reliability, we investigate whether asset size dummy predicts Tobin's *q* at year-end 1998. We regress Tobin's *q* on the independent variables from our base *OLS* regression, other than *KCGI* (which is unavailable), plus the asset subdummies listed above (regressions not shown). At year-end 1998, asset subdummy 5 takes a small, insignificant coefficient of 0.047 (t = 1.40), compared to a 0.244 (t = 4.57) at the mid-2001 date we use in this study.

D. Instrumental Variable Results for KCGI

We report two-stage least squares results for *KCGI* in *Table 8, Panel A*.[5] In regression (1), the coefficient on *KCGI* increases from .0064 in *OLS* to .0097 (*t* = 4.52). This is consistent with causation running from the portion of *KCGI* that is predicted by asset size dummy and other exogenous variables (call this *instrumented-KCGI*) to higher Tobin's *q*. In separate regressions (not shown), we confirm that instrumented-*KCGI* is significant in *2SLS* for our larger subsamples (nonbanks, non*chaebol* firms, manufacturing firms, and nonmanunfacturing firms), and positive but insignificant for *chaebol* firms.

The coefficients and *t*-statistics for our *2SLS* regressions should be interpreted with caution. The *t*-statistic on instrumented-*KCGI* in the second stage of *2SLS* tells us the strength of the *instrument* in predicting Tobin's *q*. It does not measure the strength of *KCGI* in predicting Tobin's *q*. We interpret the coefficient on instrumented-*KCGI* as follows. The coefficient on asset size dummy in the first stage regression is 16.47. When multiplied by the .0097 coefficient on instrumented-*KCGI*, the product is 0.16. This implies that for two otherwise similar firms, one just over the size threshold and the other just below it, the firm just above the threshold would have 16.5 points higher *KCGI* and 0.16 higher Tobin's *q*.

<< Place Table 8, Panel A about here>>

Six powers functional form. As a robustness check on whether we have controlled adequately for the direct effect of firm size on Tobin's *q*, regression (2) uses a flexible functional form which includes the first 6-powers of *ln*(assets) (this approach was suggested by Steven Levitt). The *t*-statistic drops due to colinearity between asset size dummy and the six-powers

[5] In estimating *2SLS*, we exclude the following dummy variables, which overlap strongly with asset size dummy: (i) *MSCI* Index (34 of 62 large firms in our sample are in the *MSCI* index, versus 26 of 433 small firms); and (ii) American Depository Receipts (*ADRs*) (12 of the 16 firms with *ADRs* are large). In regressions that include these variables, the coefficient (*t*-statistic) on *KCGI* in *2SLS* are reduced slightly, to .0086 (*t* = 4.12), versus .0097 (*t* = 4.52).

functional form, but remains highly significant (t = 2.83). The coefficient on instrumented-*KCGI* is almost unchanged. We obtain similar results in regression (3), using 6 powers of ln(sales) to control for firm size.

Alternative market value variables. As a robustness check on our Tobin's *q* results, we run *2SLS* regressions using market/book ratio and market/sales ratio as alternate measures of firm market value. *Table 8*, columns (4-5) show the results. As for Tobin's *q*, the coefficients are larger than the *OLS* coefficients in *Table 4*, with strong *t*-statistics.

3SLS. As a further check on our *2SLS* results, we run *3SLS* regressions (not shown). We use *ln*(years listed) as the best available instrument for Tobin's *q*. *Ln*(years listed) is negatively correlated with Tobin's *q* (r = -0.14, p = 0.01), and predicts lower Tobin's *q* in our base *OLS* regression. For *ln*(years listed) to be a valid instrument, it should predict *KCGI* indirectly through Tobin's *q* and not directly. There is no significant relationship between the two in our sample, either in simple correlation (r = 0.04), or in multivariate regressions (not shown) with Tobin's *q* and *ln*(years listed) as independent variables, plus our usual control variables. With these instruments, *3SLS* estimates the following system of simultaneous equations:

Tobin's $q = f$ (*KCGI*, *ln*(years listed), other variables) + ε ------- --------- (2)

KCGI = g (Tobin's *q*, asset size dummy, other variables) + η ---------- (3)

The 3*SLS* regressions produce a similar *t*-statistic for instrumented-*KCGI* (t = 4.46 versus 4.52 in *2SLS*). The coefficient estimates in *2SLS* and *3SLS* are identical, because the two sets of equations are just identified, with one instrument for each potentially endogenous variable. There is no evidence in *3SLS* of reverse causation (Tobin's *q* predicting *KCGI*) -- the coefficient on instrumented-Tobin's *q* is small and insignificant.

Mandatory versus voluntary governance rules. Asset size dummy gains its power from *mandatory* board structure rules that apply to large firms. Thus, our *2SLS* results imply that mandatory board structure rules can affect firm behavior. A competing hypothesis – call it the

"lackey effect" – is that even if voluntary adoption of 50% outside directors or an audit committee is valuable, a mandatory rule is not because insiders will put lackeys on the board and the audit committee, and the firm's behavior will not change. Our results suggest that Korean outside directors are not lackeys, or at least investors so believe.

E. Durbin-Wu-Hausman Test for Endogeneity: Results and Interpretation

If (but only if) asset size dummy is a valid instrument for *KCGI*, the Durbin-Wu-Hausman variant of the Hausman test (described in Wooldridge, 2000, pp. 482-484) lets us assess whether *KCGI* is endogenous. Durbin-Wu-Hausman is similar to two-stage-least-squares. In the first stage, we regress *KCGI* on asset size dummy and other control variables (assumed to be exogenous). In the second stage, we regress Tobin's *q* on *KCGI*, control variables, and the first-stage residual term. A significant coefficient on the first-stage residual is evidence of endogeneity. The Durbin-Wu-Hausman test does not reject the null hypothesis of no endogeneity. The second-stage coefficient on instrumented-*KCGI* is .0097 (t = 4.19). The coefficient on the first-stage residual is negative (-.0040) and insignificant (t = -1.60). The usual inference from this result is that endogeneity is not important. A similar test using 6 powers of *ln*(assets) as control variables again cannot reject the null of no endogeneity.[6]

[6] A caveat. Asset size dummy correlates more strongly with Board Structure Subindex than with the rest of *KCGI*. This permits an alternative explanation for the Durbin-Wu-Hausman results. Assume (counterfactually) that: (i) asset size dummy is a perfect instrument for Board Structure Subindex and uncorrelated with the rest of *KCGI*; (ii) *KCGI* is *not* endogenously determined together with Tobin's *q*; and (iii) a 1-point increase in Board Structure Subindex implies a larger change in Tobin's *q* than a 1-point change in the rest of *KCGI*. The coefficient on *KCGI* in the second stage of Durbin-Wu-Hausman can then be understood as the coefficient on Board Structure Subindex. The sum of this coefficient plus the coefficient on the first-stage residual can be understood as the coefficient on the rest of *KCGI*. Since, by assumption, Board Structure Subindex is stronger in predicting Tobin's *q* than the rest of *KCGI*, the coefficient on the first-stage residual will be negative, even with no endogeneity.

In effect, the coefficient on the first-stage residual in Durbin-Wu-Hausman coefficient is affected by both endogeneity and the relative strength of the *instrumented and uninstrumented* portions of-*KCGI* in predicting Tobin's *q*. Thus, the Durbin-Wu-Hausman test may wrongly reject the null of endogeneity (false positive), if *instrumented-KCGI* is significantly stronger or weaker than *uninstrumented-KCGI* in predicting Tobin's *q*. It can also wrongly fail to reject the

F. Firm Fixed Effects Results for Partial Multiyear Index

As a further robustness check for possible endogeneity, we construct a partial index for 1998-2000, consisting of four elements for which we are able to obtain data, equally weighted:

- new element B0 = fraction of outside directors (related to elements B1 (firm has 50% or more outside directors) and B2 (firm has more than 50% outside directors))
- B3 (firm has audit committee)
- B4 (firm has outside director nominating committee)
- C3 (firm has separate chairman and CEO).

We are able to obtain data for this partial index for 577 firms in 1998, 501 firms in 1999, and 604 firms in 2000. In firm fixed effects regressions, this "Partial *KCGI"* index is positive and significant (coefficient = 0.0020, $t = 3.88$). This is broadly consistent with the *OLS* and instrumental variable results for full *KCGI* presented above, although with a lower coefficient than in the cross-sectional analysis reported above.

6 Instrumenting for Part of KCGI

Asset size dummy correlates strongly with Board Structure Subindex ($r = 0.87$), and positively but less strongly with the rest of *KCGI* (r = 0.51). We address here some issues that arise because of this difference.

Instrumenting for Board Structure Subindex. In *Part 5*, we use asset size dummy to instrument for all of *KCGI*. An alternative approach is to instrument only for Board Structure

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null (false negative) when this difference-in-strength effect offsets an endogeneity effect.

As we discuss in *Part 6.B*, the portion of *KCGI* that is predicted by asset size dummy, in a simple regression of *KCGI* on asset size dummy plus a constant, takes a larger coefficient than the unpredicted portion of *KCGI* (the residual from this regression, albeit not significantly so. Thus, we expect Durbin-Wu-Hausman to produce a negative coefficient on the first-stage residual, even with no endogeneity. This is the result we find. This is consistent with endogeneity not being a significant concern.

Subindex. This approach offers a clear link between the instrument and the instrumented variable. However, asset size dummy may predict changes in the rest of *KCGI*. For example, firms that change board structure may also change board procedures. Thus, asset size dummy likely does not predict Tobin's *q only* through Board Structure Subindex, as required for a valid instrument.

We present results from instrumenting for Board Structure Subindex in *Table 8, Panel B*. In regression (1), we substitute Board Structure Index for *KCGI*. The first-stage coefficient on asset size dummy is about 12, compared to 16.5 in *Panel A*, regression (1). In effect, about 12 points of the 16.5 point jump in *KCGI* at 2 trillion won reflects board structure; while the other 4.5 points reflect change in other subindices. The second-stage coefficient on instrumented Board Structure Subindex is .0133 (t = 4.19). However, it follows from the mathematical structure of *2SLS* that if we substitute Board Structure Subindex for *KCGI*, then ~~(1) the t statistic on the instrumented variable will not change (t = 3.86 in both cases); and (2)~~ the product of (first-stage coefficient on asset size dummy) x (second-stage coefficient on instrumented-variable) will be the same (16.47 x 0.0097 in *Panel A* = 12.05 x .0133 in *Panel B*). Thus, if asset size dummy partly predicts the rest of *KCGI*, the .0133 coefficient on instrumented-Board Structure Subindex is an upward biased estimate of the true coefficient, which captures the effect of asset size dummy on both Board Structure Subindex and the rest of *KCGI*, both of which predict Tobin's *q*.

In *Table 8, Panel B*, regression (2), we add (*KCGI* - Board Structure Subindex) as an additional control variable. This reduces the overestimation but may still produce a biased coefficient, because *2SLS* assumes that (*KCGI* - Board Structure Subindex) is independent of asset size dummy, when it is not.

<< Place Table 8, Panel B about here>>

Decomposing KCGI into Predicted and Orthogonal Components. Another approach, given that Board Structure Subindex captures most but not all of the effect of asset size dummy

on *KCGI*, is to return to *OLS* and decompose *KCGI* into a portion that is predicted by asset size dummy (*KCGI-predicted*) and an orthogonal portion (*KCGI-orthogonal*), by regressing *KCGI* on asset size dummy plus a constant. *KCGI-predicted* is related to but not the same as the predicted value of *KCGI* from the first stage of *2SLS* because the first stage of *2SLS* involves regressing *KCGI* on asset size dummy *plus all other independent variables*. Similarly, *KCGI-orthogonal* is related to but distinct from the residual in the first stage of *2SLS*.[7]

In a regression (not shown) similar to our base *OLS* regression, *KCGI-predicted* and *KCGI-orthogonal* have coefficients of 0.0083 (t=5.24) and 0.0058 (t = 4.96), respectively. A Wald test (F = 2.56, p = 0.11) cannot reject the null of no difference in strength between *KCGI-predicted* and *KCGI-orthogonal*. These results are consistent with both governance elements that jump at 2 trillion won and those that do not jump predicting higher Tobin's *q*. Suppose, however, that the difference in strength between *KCGI-predicted* and *KCGI-orthogonal* is real, even though not significant.

The larger coefficient on *KCGI-predicted* than on *KCGI-orthogonal* (.0076 versus .0059), and the larger coefficient on instrumented-*KCGI* in *2SLS* than on *KCGI* in *OLS* (.0097 versus .0064) provide evidence that the component of *KCGI* that is predicted by asset size dummy predicts Tobin's *q* more strongly than the remainder of *KCGI*. At the same time, the insignificant difference between the coefficients on *KCGI-predicted* and *KCGI-orthogonal*; and the insignificant coefficient on the first-stage residual in Durbin-Wu-Hausman, tell us that these differences are not significant.

[7] The difference is as follows. In *2SLS* and in Durbin-Wu-Hausman, the first-stage regression includes all control variables. In contrast, the first-stage regression used to determine *KCGI-predicted* and *KCGI-orthogonal* includes only asset size dummy plus a constant. In Durbin-Wu-Hausman, the coefficient on *KCGI* plus the coefficient on the first-stage residual provides an estimate of the coefficient on the unpredicted portion of *KCGI* (.0097 - .0041 = .0053). The decomposition procedure in the text estimates this coefficient at .0058.

Possible Endogeneity of the Unpredicted Component of KCGI. The insignificant coefficient on the first-stage residual in Durbin-Wu-Hausman provides evidence against endogeneity of *KCGI* as a whole. It remains possible that the portion of *KCGI* that is *not* predicted by asset size dummy is endogenous. We cannot rule out this possibility.

The most we can say is this. The similar coefficients on *KCGI-predicted* and *KCGI-orthogonal*, the failure of Durbin-Wu-Hausman to reject the null of no endogeneity, the lack of evidence of reverse causation in our *3SLS* regressions, and our extensive control variables (which reduce the importance of the optimal differences flavor of endogeneity) make it likely that a causal connection exists for the unpredicted portion of *KCGI* also. It would be odd if the part of *KCGI* that we can instrument for is not significantly endogenous, while the rest is so strongly endogenous as to offset the *OLS* correlation between *KCGI-orthogonal* and Tobin's *q*.

7. Sources of the Correlation Between Governance and Market Value

In this part, we evaluate possible sources of the correlation between corporate governance and firm market value. Better-governed firms could be more profitable today; investors could expect higher future profitability; they could pay more dividends for a given level of profits; they could make better investments; or investors could value the same earnings (or dividends) more highly, perhaps because insiders are less likely to divert profits to themselves. If we allow for endogeneity between profitability and governance, still other possibilities arise.

We find mild evidence that better governed firms are more profitable, and no evidence that they pay higher dividends for a given level of profits or make different capital expenditure decisions. We find somewhat stronger evidence that investors value the same earnings (or dividends) more highly for better-governed firms. In effect, better-governed firms appear to enjoy a lower cost of capital. This could reflect investor beliefs that better-governed firms will be more profitable in the future; that better governed firms will suffer less tunneling; or both.

A. Evidence on Profitability, Capital Expenditures, and Dividends

Table 9 shows the coefficient on *KCGI* for an array of profitability variables. We use three different measures of profit: ordinary income (basically earnings before taxes and extraordinary items); *EBIT* (ordinary income plus interest); and *EBITDA* (*EBIT* plus depreciation and amortization expense)[8] For each, we report results with five different denominators: sales; book value of assets; book value of common stock; market value of assets; and market value of common stock. We also report results with sales, capital expenditures, and dividends in the numerator. Sales/assets and capex/sales are alternate measure of firm efficiency (e.g., Gompers, Ishii and Metrick, 2003). The capex and dividend regressions can help us assess whether a firm's capital expenditure and dividend payout choices correlate with its governance. The regressions with sales, book assets, and book equity in the denominator provide purely accounting-based measures of profitability. The regressions with market value of equity or market value of assets in the denominator provide mixed market and accounting-based measures.

In *Table 9*, we use the same control variables as in our base *OLS* regression, except that (i) we omit the following control variables, which have no obvious connection to accounting measures of profitability: share turnover, foreign ownership, *ADR* dummies, and *MSCI* Index dummy, and (ii) we switch from debt/equity to debt/assets as a control variable for regressions with book value of equity or market value of equity in the denominator.

Table 9 does not provide evidence that *KCGI* correlates with accounting measures of profitability. The coefficients on our profitability measures are mixed in sign and insignificant.

<< Place Table 9 about here>>

[8] We also run regressions with net income in the numerator. The coefficients on *KCGI* are insignificant in all cases, and R^2 is significantly lower than for similar regressions with other income measures, suggesting that net income is a noisy measure of profitability.

B. Evidence on Earnings and Dividend Multiples

There is stronger evidence that investors value the same earnings more highly for better-governed firms. In *Table 9*, the coefficients on *KCGI* for *EBITDA*, *EBIT* and ordinary income/(market value of assets) are all negative and significant. With market value of total equity in the denominator, *EBITDA* is negative and significant, EBIT is negative and marginally significant, and ordinary income is negative but insignificant.

There is also evidence that investors value the same level of dividends more highly for better-governed firms. The coefficient on dividends/(market value of assets) is negative and significant and the coefficient on dividends/(market value of total equity) is negative and marginally significant. Put differently, there is some evidence that better governed firms enjoy a lower cost of capital. They can attain higher market value with the same level of dividends or earnings.

Better governed firms also have a lower ratio of both sales and capital expenditures to both market value of total equity and market value of assets. These results are driven by the higher market value of these firms. Similar regressions with book value of equity or assets in the denominator produce insignificant coefficients with varying sign.

C. Wealth Creation Versus Wealth Transfer

Our study leaves an uncertainty, related to the question of whether better-governed firms are more profitable. Investors could pay higher prices for a firm's shares because better governed firms have higher total value (wealth creation), or because better governance reduces the fraction of firm value captured by controlling shareholders (wealth transfer). The wealth creation versus wealth transfer question is related to whether Korean governance is in or out of equilibrium. If governance improvements primarily involve wealth transfer, then current governance norms could be in or close to equilibrium. If governance improvements primarily involve wealth creation, this implies that Korean governance is out-of-equilibrium.

The wealth creation and wealth transfer stories lead to different predictions for future voluntary governance changes. If the dominant effect is wealth creation, the controlling shareholders of many small firms may adopt governance reforms. However, if wealth transfer dominates, voluntary governance improvements are less likely, especially for firms with no immediate need to issue additional shares.

8. Results for Control Variables, Subindices, and Board Composition

We return in this part to *OLS*, and describe results for the control variables we use in our base *OLS* regression (Section *A*). We then consider the predictive power of each subindex (Section *B*), individual governance elements (Section *C*), and board composition in particular (Section *D*). Two important results emerge. First, the power of *KCGI* is not sensitive to how we construct this index, and comes from the cumulative effect of all five subindices. Second, Korean firms with 50% outside directors have significantly higher share prices than firms with fewer outside directors. This effect appears to be causal. This is the first strong evidence that greater board independence predicts higher share prices in emerging markets.

A. Results for Control Variables

We employ extensive control variables to limit omitted variable bias, as well as the potential for the optimal differences flavor of endogeneity. The rationale, and *OLS* regression results, for each control variable are described below.

Industry dummy variables. Both governance and Tobin's *q* may reflect industry factors. We use dummy variables based on 4-digit Korea Standard Industrial Classification (KSIC) codes in regressions using our full sample and the larger (> 100 firms) subsamples in *Table 5*. We use 2-digit industry dummies for smaller subsamples to preserve degrees of freedom. We find similar results with 2-digit and 4-digit industry controls for our full sample and larger subsamples.

Firm size. We discussed this variable in *Part 5*. Consistent with prior research (e.g., Lang and Stulz, 1994), the coefficient on *ln*(assets) is negative and highly significant. Our *OLS*

and *2SLS* results are similar if we substitute *ln*(sales) for *ln*(assets), or use a 6 powers functional form of *ln*(assets) or *ln*(sales).

Ln(years listed). Older firms could differ from younger firms both in Tobin's *q* and governance practices. We therefore include *ln*(years listed) as a control variable. We expect a negative coefficient because younger firms are likely to be faster-growing and perhaps more intangible asset-intensive. This variable is negative and significant.

Firm leverage. Leverage can affect both Tobin's *q* and a firm's governance practices. Governance may also affect a firm's access to credit (Bhojraj and Sengupta, 2003). We control for debt/market value of equity (when we use market/book as a dependent variable, we use debt/book value of assets as a control variable). This control is positive and significant.

Growth prospects. A firm's growth prospects should affect Tobin's *q* and may affects its governance practices. We control for growth prospects with geometric average sales growth over the last 5 years (1996-2000). This variable is insignificant. We obtain similar results using 2-year sales growth (over 1999-2000) and future growth (over 2001-2002). [9]

As an alternate measure of growth prospects, we use analyst forecasts of 1-year and 2-year earnings growth from I/B/E/S. We are able to obtain 1-year (2-year) forecasts for 371 (304) firms in our sample. The coefficient on *KCGI* is similar to the 0.0064 coefficient we report in *Table 4* and is statistically strong, at 0.0052 (t = 4.21) with 1-year forecasts and 0.0074 (t =5.12) with 2-year forecasts.

Intangible assets. Tobin's *q* is positively related to a firm's intangible assets; asset tangibility may also affect a firm's governance practices. We therefore control for *R&D* expense/sales and advertising expense/sales. *R&D*/sales can also plausibly proxy for growth

[9] For future sales growth, to avoid endogeneity risk (which arises because current Tobin's *q* or *KCGI* can affect future growth), we follow a procedure, suggested by Bernard Yeung, of first regressing *KCGI* on future sales growth, and using the residual from this equation (which is orthogonal to future growth and thus free of this endogeneity concern) to predict Tobin's *q*.

prospects. *R&D*/sales is positive and significant, but becomes insignificant with six powers of *ln*(assets) as a firm size control. Advertising/sales is positive but insignificant. We obtain similar results for *KCGI* in regressions that include (*R&D*/sales)^2, (advertising/sales)^2, an R&D dummy (= 1 for firms with nonzero *R&D*), and an advertising dummy (= 1 for firms with nonzero advertising).

Capital intensity. A firm's capital intensity can plausibly affect both Tobin's *q* and its governance practices. We therefore control for property, plant and equipment (*PPE*)/sales. and (*PPE*/sales)^2. *PPE*/sales is significant and negative while (*PPE*/sales)^2 is significant and positive.

Capital expenditures. As a further control for both growth opportunities and capital intensity, we include a measure of capital expenditures relative to the historic capital stock, capital expenditures (Capex)/*PPE*. This variable is positive and marginally significant.

Exports. Korean policy traditionally favored export industries, which could affect profitability and growth opportunities, and thus Tobin's *q*, for export-oriented firms. We therefore include a variable for exports/sales. This variable is insignificant and of varying sign depending on which other control variables we use. We obtain similar results for *KCGI* if we include an (exports/sales)^2 control.

Profitability. Profitability is likely to be related to Tobin's *q*. We therefore control for operating margin, defined as EBIT/sales. This variable is positive but insignificant.

Market share. A firm's market share within its industry may affect profitability and thus affect Tobin's *q*, and may also affect firms' governance choices. We therefore control for *market share* (the firm's share of sales in its 4-digit industry). Market share is positive, as expected, but insignificant. In regressions with 2-digit industry controls, we include the Herfindahl Hirschman index for the firm's 4-digit industry as a control for market concentration, with similar

results for *KCGI*. This variable is not available with 4-digit industry controls because it is perfectly correlated with a linear combination of the 4-digit industry dummies.

Liquidity. Share prices may be higher for firms with more easily traded shares. We control for ease of trading with share turnover, defined as (shares traded during 2000)/(shares held by public shareholders). Share turnover is positive, as expected, and significant.

Chaebol membership. Firms that belong to a *chaebol* group may have stronger political connections, political visibility, or access to financing, or be more diversified, which could affect Tobin's *q* or governance choices. *Chaebol* firms are also subject to special rules for related party transactions (see *Part 5.B*). We therefore include a dummy variable for membership in the top 30 c*haebol* (*chaebol30*). This variable is positive and marginally significant, but becomes insignificant in *2SLS* and in regressions with six powers of *ln*(assets) as a firm size control.

These moderately positive results for *chaebol* firms contrast with Joh (2003), who finds that *chaebol*-firms were less profitable than other firms prior to the 1997-1998 financial crisis; and Cho and Kang (2002), who find lower market/book ratio for *chaebol* firms in the post-crisis period from 1998-2000. Possible explanations for our results include the later time period that we study and our extensive corporate governance and other control variables.

Inside share ownership. Share ownership is an important element of corporate governance, but the relationship between ownership and firm value is unclear and possibly nonlinear. In Korea, Joh (2003) and Cho and Kang (2002) find that higher inside share ownership predicts higher firm value. Chang (2003) finds similar results in cross-section, but insignificant results with firm fixed effects. We control for ownership by the largest shareholder (whether an individual or a firm), and ownership^2. Neither variable is significant. If we remove ownership^2, the coefficient on ownership is insignificant and close to zero. With an alternative definition of ownership by the largest *individual* shareholder, which disregards a

larger stake held by another firm, ownership takes a significant *negative* coefficient, while Ownership Parity Subindex becomes weaker (though still positive and significant).

Foreign investor interest. Foreign investors are diversified and may be willing to pay higher prices than domestic investors. They may also pressure firms to improve their governance, or invest in better governed firms. Foreign share ownership, as a percentage of shares outstanding, is positive and significant. We obtain similar results if we measure foreign ownership as a percentage of shares not held directly or indirectly by the largest shareholder.

Listing on foreign exchanges. We include control variables for the existence of *ADRs* (American Depository Receipts). Firms can have their shares traded on *NASDAQ, but not listed*, using level 1 *ADRs* (six firms in our sample). These firms are not subject to additional disclosure requirements. Firms can also list on NASDAQ or the New York Stock Exchange through level 2 or 3 *ADRs*, which require compliance with exchange listing and disclosure rules (10 firms in our sample). Firms with level 2 or 3 *ADRs* likely have better overall governance, which we confirm (regression not shown). Other studies report that firms with level 2 or 3 *ADRs*, have higher Tobin's *q* (Doidge, Karolyi and Stulz, 2004). We can either include *ADR* level in our governance index or treat *ADR*s as a control variable. Given the small number of firms with *ADRs*, we choose the second approach, with separate dummy variables for level 1 *ADR*s and for level 2 or 3 *ADR*s. The coefficients on both *ADR* dummies are insignificant.

MSCI Stock Index. We include a dummy variable for inclusion in the Morgan Stanley Capital International (*MSCI*) Index, the principal international stock index covering Korea. Inclusion in the *MSCI* index may proxy for price pressure due to purchases by index funds, greater liquidity, and foreign investor interest. This variable is positive and significant.

Banks. We include a bank dummy variable because banks face special governance rules (see *Part 5.B*), and may be valued differently than other firms (13 firms in our sample). This variable is negative and insignificant.

State-owned enterprises. Our results are similar if we include a dummy variable for former state-owned enterprises (*SOEs*) (Korea Electric Power, Korea Gas Corporation, Korea Heavy Industries and Construction, Korea Telecom, and Posco). These firms are subject to special corporate governance rules (see *Part 5.B*). Only Korea Electric Power remains majority state-owned.

Beta. Our results are similar if we include a dummy variable for firm β, measured over the preceding year or the following year.

Board size. Our results are similar if we include board size as a control variable. We consider two specifications of a board size variable: (i) number of directors; and (ii) a dummy variable, equal to 0 if the firm has 8 or fewer directors, 0.5 for boards with 9-12 members, and 1 otherwise. Both are insignificant, with different signs.

Subjective corporate governance index. Our results are similar if we include a subjective corporate governance index, which we construct based on 20 questions in the *KSE* survey that ask for the respondent's opinions on various corporate governance issues. The subjective index could predict firm value because management attitudes influence investor beliefs about management quality, or because it proxies for governance elements that were omitted from *KCGI*. The coefficient on the subjective index is small and insignificant.

Correlation between KCGI and control variables. Many of the control variables could affect firm governance. Obvious candidates include foreign ownership and the *ADR*, *MSCI*, bank, and *chaebol30* dummy variables. The correlation coefficients between *KCGI* and these variables are all significant and positive. Taken together, the control variables explain a bit over 60% of the variance in *KCGI* (a variance inflation factor of 2.53), which is well within acceptable bounds. These partial correlations should not bias the *OLS* coefficient on *KCGI*, but will increase estimation error and reduce the *t*-statistic on *KCGI*.

B. Results for Subindices and Reduced Indices

Table 10 contains our *OLS* results for subindices. In robustness checks (not shown) we obtain similar results with market/book and market/sales as dependent variables. In row (1), we regress Tobin's *q* on each of our five subindices, included one at a time in separate regressions, in each case replacing *KCGI* in our base *OLS* regression: Each subindex is significant at the 1% level or better.

This approach, however, raises an omitted variables problem. The predictive power of each subindex partly reflects its correlation with the other (omitted) subindices. In row (2), we control for the other subindices by adding, as a control variable for each subindex, a Reduced Index (0~80) that equals (*KCGI* - indicated subindex). We show results for subindices in row (2A) and for each Reduced Index in row (2B). All subindices have positive coefficients, but the coefficients and *t*-statistics decline, as expected. Board Structure, Disclosure, and Ownership Parity subindices remain significant.. Shareholder Rights Subindex is marginally significant and Board Procedure Subindex become insignificant. In row (3), we include all five subindices in a single regression, with similar results.

<< Place Table 10 about here>>

Since each subindex is significant in row (1), almost any weighting will produce an overall index that is significant in explaining Tobin's *q*. Moreover, the coefficients on subindices are similar in magnitude, ranging in row (1) from .0064 to .0133 and in row (3) from .0040 to .0106. Thus, subindex weights are unlikely to greatly affect the coefficient or significance of *KCGI*.

We confirm the intuition that our results for *KCGI* are not sensitive to subindex weights in two ways. First in row (2B), each Reduced Index is statistically strong, and coefficients vary only from 0.0057 to 0.0072. The significance of each Reduced Index is lower than for *KCGI*. This is consistent with the predictive power of *KCGI* reflecting the combined effect of all subindices, including the less powerful Shareholder Rights and Board Procedure subindices.

Consider next the results in *Table 10*, row (3). Including each subindex separately lets the regression procedure weight each subindex optimally. Yet raw R^2 increases only from .4165 in our base *OLS* regression to .4199 in this regression, while adjusted R^2 *declines* from .3343 to .3332. Thus, allowing different weights on subindices does not improve regression power.

We can use the row (3) regression to construct an "optimal" index that maximizes the power of our base *OLS* regression to predict Tobin's *q* This optimal index is:

$KCGI_{optimal}$ = 0.1303 * Shareholder Rights Index + 0.2061 * Board Structure Subindex
+ 0.1576 * Board Procedure Subindex + 0.1879 * Disclosure Subindex
+ 0.3182 * Ownership Parity Subindex

This optimal index would take an *OLS* coefficient of .0064 (t = 6.12), only modestly higher than the coefficient of .0066 (t = 6.30) for actual *KCGI*.

C. Results for Individual Corporate Governance Elements

Table 11 contains *OLS* results for the individual elements of *KCGI*. For *Table 11*, we define elements that affect only firms with audit committees (*D1, D3, D6, D8,* and *D10*), so that firms without audit committees have "0" values instead of missing values to preserve sample size and reduce multicolinearity issues. This has little effect on results for other elements.

Column (1) shows results from regressions similar to our base OLS regression, in which we replace *KCGI* with each individual element. Most (35/39) of the coefficients on individual corporate governance elements are positive, 9 are significant; 6 more are marginally significant; and all negative coefficients are insignificant. Like our results for subindices, these results are consistent with the power of *KCGI* in predicting Tobin's *q* coming from multiple corporate governance elements, rather than a few powerful elements.

<< Place Table 11 about here>>

The regressions in column (1) overstate the power of individual elements, most of which correlate with the (omitted) rest of *KCGI*. Column (2) shows coefficients on each element after

adding two control variables -- (i) a Reduced Index (*KCGI* - other subindices), and (ii) a "reduced subindex" containing the other elements of the subindex to which the element belongs. For example, in the regression for element *A1*, we include controls for (i) *KCGI* - Shareholder Rights Subindex; and (ii) the firm's score on a reduced shareholder rights subindex consisting of elements *A2-A5*.

Only three individual elements are significant or marginally significant both alone and with these controls. All involve plausibly important attributes of governance. These are element *A4* (firm discloses director candidates to shareholders in advance of shareholder meeting); element *B1* (firm has at least 50% outside directors); and ownership parity. Given the importance of the connection between board composition and firm value, we consider the outside directors result with more care in the next section.[10]

D. Board Independence

A minimum number of *outside* directors, preferably *independent* directors without significant ties to management or controlling shareholders, are part of conventional wisdom on what constitutes good corporate governance. Yet, in developed countries, there is no evidence that firms with more independent directors perform better or have higher share prices.

Our results for board composition thus deserve special attention. They are the first time, to our knowledge, that a strong connection between board composition and firm market value has

[10] For element *A5* (board approval required for related party transactions), the survey responses may be inaccurate. This approval was required by law for *chaebol* firms if a transaction exceeded 10 billion won or 10% of the firm's book equity. At the mid-2001 date when we measure firm market values, a similar rule applied to large firms. Yet, perhaps because these requirement were fairly new, or because they affect only large transactions, only 58 of 109 *chaebol* firms and 41 of 67 large firms (14 of 26 large non-chaebol firms) answered yes for this element. Yet investors likely assessed all *chaebol* and large firms similarly in this respect. To assess whether mixed responses by *chaebol* and large firms affect our results, we rerun our *OLS* regressions defining element *A5* to equal 1 for *chaebol* firms, large firms, and any other firms that answered yes to this survey question. The coefficients and t-statistics on *KCGI* and Shareholder Rights Subindex increase marginally, but element *A5* remains insignificant.

been found. In *Table 11*, 50% outside directors (element *B1*) takes a coefficient of 0.1630 (t = 4.67) without controls for the rest of *KCGI*, and remains strong at 0.1294 (*t* = 3.07) *with* controls for the rest of *KCGI*. This implies that a firm with 50% or more outside directors has 0.128 higher Tobin's *q*, all else, including the rest of its governance, constant. This is roughly a 40% increase in share price for a firm with Tobin's *q* and debt/assets equal to the sample means.

A major concern in board composition studies is that firms may endogenously choose their board composition to maximize share value (Hermalin and Weisbach, 1998, Miwa and Ramseyer, 2003), or use board composition to signal management quality. If so, higher share prices for firms with 50% outside directors may not imply that other firms could increase their market value by adopting such boards. However, in Korea, most firms that have 50% outside directors are large firms and banks, for which 50% outside directors are required by law. Only a handful of these firms had 50% outside directors before the law required this (see *Part 5.C*). For these firms, endogeneity and signaling stories can be ruled out.

In separate regressions similar to *Table 11*, column (2) (not shown), the coefficient estimates on element *B1*, in regressions are similar for the 65 firms where 50% outside directors are required (coeff. = .1461, *t* = 3.47) and for the 18 firms that voluntarily choose to have 50% outside directors (coeff. = .1285, *t* = 2.60). The difference between the two groups is insignificant. The result for required adopters cannot reflect endogeneity or signaling.

Our results thus provide evidence that board independence is likely to causally predict higher prices in an emerging market. This could be because outside directors may help to control self-dealing by insiders, which historically has been a serious problem in Korea. A question for future research is whether self-dealing is in fact lower for Korean firms with 50% outside directors.

Mandatory versus voluntary adoption. Our results for 50% outside directors, like our overall instrumental variable results, suggest that mandatory board composition rules can affect

firm behavior, or at least investors so believe. They do not support the "lackey effect" – in which insiders who don't want oversight by outside directors put lackeys on the board.

More than 50% outside directors. We find limited evidence that increasing the proportion of outside directors beyond 50% further increases share prices. In *Table 11*, column (2), the coefficient on element *B2* (more than 50% outside directors) is positive at .0361, but insignificant. Significance is suppressed by the correlation (r = 0.55) between firms with at least 50% outside directors and firms with more than 50% outside directors.

Foreign directors. Oxelheim and Randoy (2003), report that firms in Norway and Sweden with foreign directors have higher Tobin's *q*. In contrast, the presence of a foreign director does not predict higher market value for Korean firms. In *Table 12*, the coefficient on presence of a foreign outside director (element *C7*) is negative and insignificant, both with and without controls for the rest of *KCGI*.

9. Conclusion

In this paper, we report evidence that corporate governance is an important factor in explaining the market value of Korean public companies, and that this effect is likely causal. We construct a corporate governance index (*KCGI*, 0~100) for 525 of the 560 companies listed on the Korea Stock Exchange. We employ extensive control variables. We find an economically significant correlation between *KCGI* and firm market value. A worst-to-best change in KCGI predicts a 0.47 increase in Tobin's *q* (roughly a 160% increase in share price for a firm with Tobin's *q* and debt/assets equal to the sample means). This correlation is robust across *OLS*, *2SLS* and *3SLS* regressions, subsamples, alternate specifications of the corporate governance index, and alternate measures of firm market value.

To address endogeneity and signaling explanations for our results, we estimate *2SLS* and *3SLS* using an asset size dummy (= 1 for large firms), as an instrument for *KCGI*. This instrument is appropriate because several important governance rules apply only to large firms.

We use regression discontinuity analysis to control for the direct effect of firm size on Tobin's *q*, Our instrumental variable results support the inference from *OLS* that stronger corporate governance predicts higher market value. We find no evidence of reverse causation or other significant endogeneity. The regression discontinuity approach (borrowed from labor economics) is potentially generalizable to other corporate governance research. It can apply whenever corporate governance rules change based on a numerical criterion such as firm size.

We also find evidence that Korean firms with 50% outside directors are more highly valued. Firms with 50% outside directors have 0.13 higher predicted Tobin's *q* (roughly 40% higher share price), with similar coefficients for firms for whom 50% outside directors are mandatory and firms that voluntarily adopt this practice. This suggests that outside directors can be valuable in a emerging market country, even if the outside director requirement is imposed by law rather than voluntarily chosen.

Better corporate governance does not appear to predict higher firm profitability. It does appear to predict lower cost of external capital, perhaps because investors expect insiders to engage in less self-dealing. It is an open question to what extent the higher share prices of better governed firms reflect an increase in total firm value, versus a decline in private benefits of control enjoyed by insiders.

We can also perhaps learn something about the importance of corporate governance across countries by combining our results with those in Gompers, Ishii and Metrick (2003) and Black (2001), taking each at face value. A worst-to-best governance change has a 700-fold (70,000%) predicted effect on Russian share prices in 1999 (Black, 2001); a roughly 160% predicted effect in Korea in 2001 (this study), and a 2-9% effect in the 1990s in the U.S. (depending on year) (Gompers, Ishii and Metrick, 2003). This is consistent with governance mattering more when other legal rules and cultural norms that protect minority shareholders are weaker.[11]

[11] Durnev and Kim (2003) report a significant negative interaction between corporate

governance score and a measure of legal strength for the *S&P* disclosure index, but insignificant results for the *CLSA* index. Doidge, Karolyi and Stulz (2002) report that firms with weaker home-country governance receive a higher price jump when they cross-list their shares on foreign exchanges.

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Figure 1. Distribution of Korean Corporate Governance Index, *KCGI*

Histogram of distribution of *KCGI* scores. Sample size = 525. Mean (median) =32.63 (29.87); minimum = 12.73; maximum = 86.93, standard deviation = 11.59; skewness = 1.56.

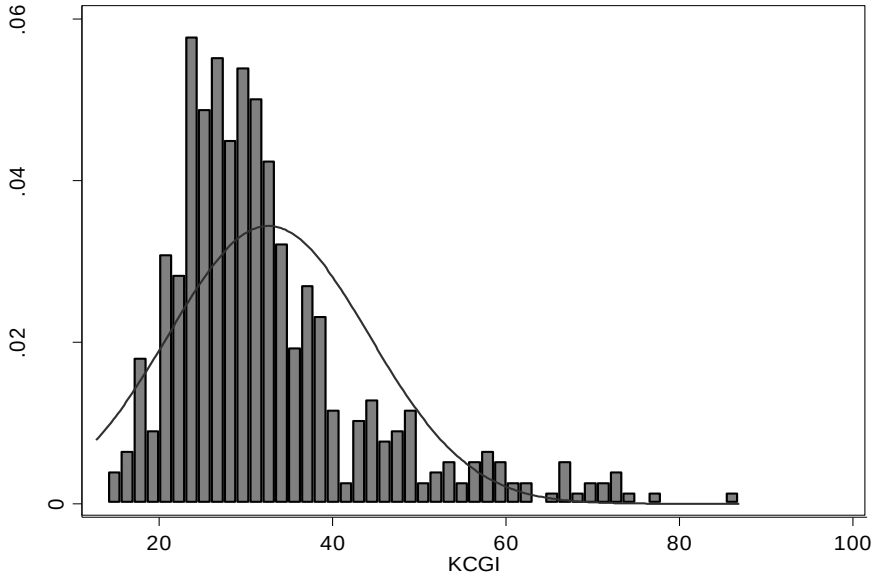


Figure 2. Corporate Governance and Tobin's *q*

Scatter plot of *KCGI* versus Tobin's *q*. 20 observations are identified as outliers and dropped based on a studentized residual greater than ±1.96. Sample size = 505. Highest and lowest 5% of Tobin's *q* values are suppressed in the scatter plot for better visual presentation. [Figure was originally reported without robust standard errors, with $t = 8.19$.]

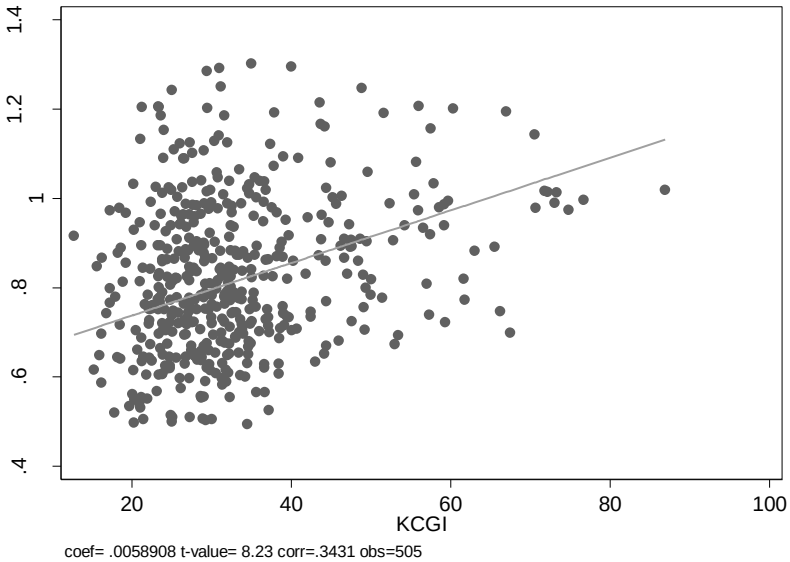


Figure 3: Discontinuity: Asset Size versus *KCGI*

Scatter plot of *ln*(assets) versus *KCGI*. The fitted lines are from a regression of *KCGI* on *ln*(assets) plus a constant term. They are estimated using 525 firms for which we have *KCGI*, are constrained to have a common slope, but intercepts are separately estimated for large firms (assets > 2 trillion won) and small firms (assets < 2 trillion won). The vertical line indicates 2 trillion won in assets. [Figure was originally reported without robust standard errors, with t = 19.54.]

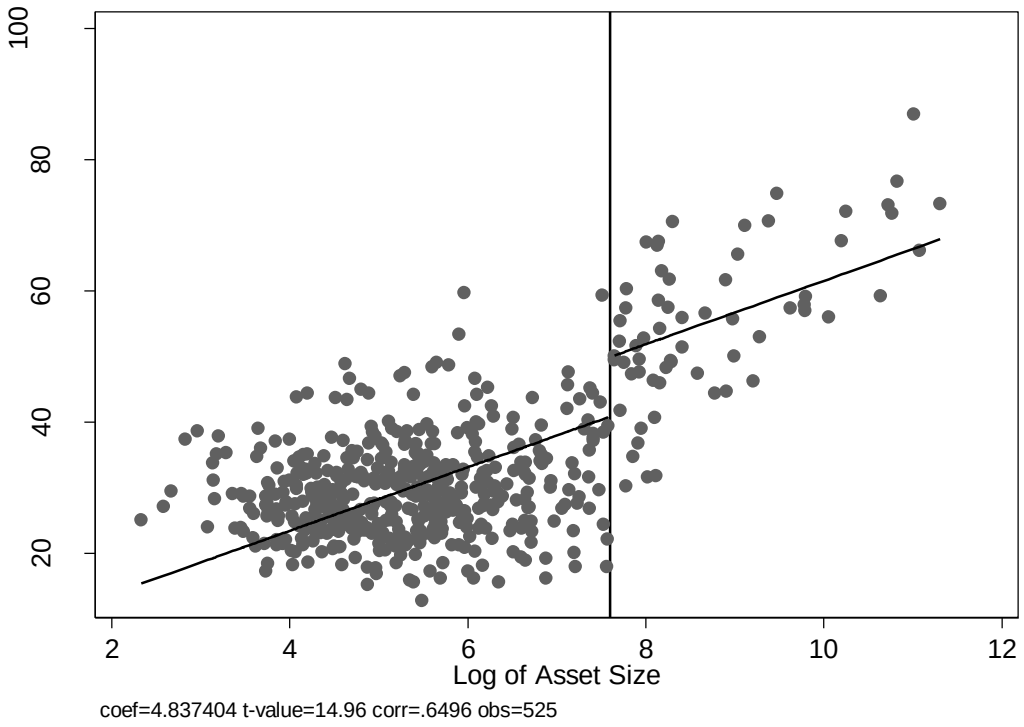
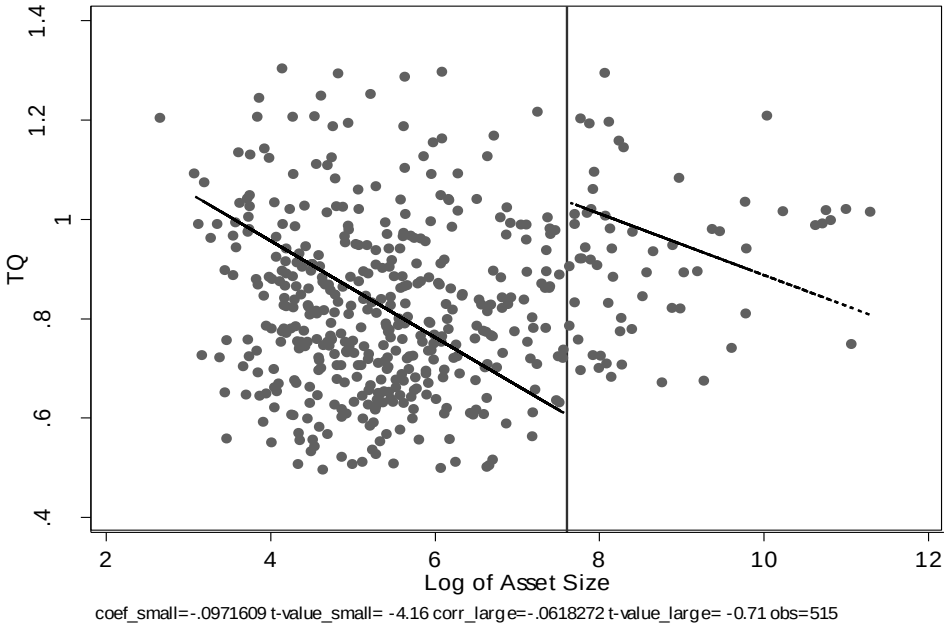


Figure 4: Discontinuity: Asset Size versus Tobin's *q*

Scatter plot of *ln*(assets) versus Tobin's *q*. The fitted lines are from *OLS* regressions similar to *Table 4, regression (4)*, except that (i) the slopes and intercepts are separately estimated for large firms and small firms; (ii) we omit *KCGI* as an independent variable; and (iii) we include outliers. The intercept is estimated for each subsample by subtracting the mean value of Tobin's *q* from (the mean value of ln(assets) multiplied by the slope coefficient). This lets the regression line jump and change slope at 2 trillion won. The vertical line indicates 2 trillion won in assets. Tobin's *q* values outside the 5th and 95th percentile are included in the regression results but are suppressed in the graph.



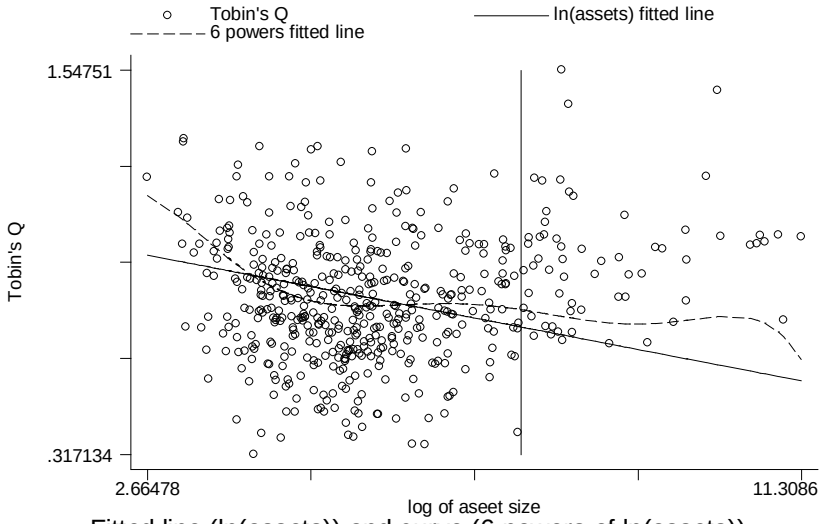
Tobin's q = 1.345-0.097*ln(assets) if small

Tobin's q = 1.506-0.062*ln(assets) if large

Jump at 2 trillion won = [1.506 - 0.062*(7.6)] - [1.345 - 0.097*(7.6)] = 0.427

Figure 5: Tobin's *q* versus Asset Size

Fitted regression lines for *ln*(assets) versus Tobin's *q*. The straight line is for *ln*(assets), taken from on our base *OLS* regression. The dashed curve is a fitted curve for the first six powers of ln(assets), taken from a regression, otherwise the same as our base *OLS* regression, that includes these six powers. Data points are shown in the background. The vertical line indicates 2 trillion won in assets.



Fitted line (ln(assets)) and curve (6 powers of ln(assets))

Table 1. Corporate Governance Index: Elements and Summary Statistics

Description and summary statistics for the 39 elements included in Korean Corporate Governance Index (*KCGI*), for the 515 firms included in our base *OLS* regression (Table 4, regression (4)), before excluding outliers. All variables except Ownership Parity are coded as yes=1, no=0. In the "responses" column the first number indicates the number of "1" responses, the second number indicates the total number of responses. The number of possible responses is 515 except for questions about audit committee, which apply only to the 90- firms that have audit committees.

Label	Variable	Responses	Mean	% Responding
Shareholder Rights Subindex				
A.1	Firm uses cumulative voting for election of directors.	29/515	0.056	100%
A.2	Firm permits voting by mail.	68/515	0.132	100%
A.3	Firm chooses shareholder meeting date to not overlap with other firms in industry, or chooses location to encourage attendance.	86/515	0.167	100%
A.4	Firm discloses director candidates to shareholders in advance of shareholder meeting.	91/515	0.177	100%
A.5	Board approval is required for related party transactions.	172/515	0.334	100%
	All elements of Shareholder Rights Subindex	**515**		**100%**
Board Structure Subindex				
B.1	Firm has at least 50% outside directors.	78/515	0.151	100%
B.2	Firm has more than 50% outside directors.	27/515	0.052	100%
B.3	Firm has outside director nominating committee.	82/515	0.159	100%
B.4	Firm has audit committee.	90/515	0.175	100%
	All elements of Board Structure Subindex	**515**		**100%**
Board Procedure Subindex				
	Elements that apply to all firms			
C.1	Directors attend at least 75% of meetings, on average.	254/466	0.545	90%
C.2	Directors' positions on board meeting agenda items are recorded in board minutes.	212/515	0.412	100%
C.3	CEO and board chairman are different people.	25/515	0.049	100%
C.4	A system for evaluating directors exists.	33/515	0.064	100%
C.5	A bylaw to govern board meetings exists.	362/515	0.703	100%
C.6	Firm holds four or more regular board meetings per year.	246/515	0.478	66%
C.7	Firm has one or more foreign outside directors.	36/515	0.070	100%
C.8	Outside directors do not receive retirement pay.	268/515	0.520	60%
C.9	Outside directors can obtain advice from outside experts at the company's expense.	74/515	0.144	60%
C.10	Firm has or plans a system for evaluating outside directors.	150/515	0.291	95%

Label	Variable	Responses	Mean	% Responding
C.11	Shareholders approve outside directors' aggregate pay (separate from shareholder approval of all directors' aggregate pay).	46/515	0.089	90%
C.12	Outside directors attend at least 75% of meetings, on average.	186/515	0.361	87%
C.13	Firm has code of conduct for outside directors.	39/515	0.076	100%
C.14	Firm designates a contact person to support outside directors.	263/515	0.511	100%
C.15	Board meeting solely for outside directors exists.	22/515	0.043	100%
C.16	Firm has not lent outside directors funds to purchase unsubscribed shares from the company.	507/515	0.984	100%
D.2	Bylaws governing audit committee (or internal auditor) exist.	305/470	0.592	91%
D.4	Audit committee (or internal auditor) recommends the external auditor at the annual shareholder meeting.	352/476	0.683	92%
D.5	Audit committee (or internal auditor) approves the appointment of the internal audit head.	180/387	0.350	75%
D.7	Report on audit committee's (or internal auditor's) activities at the annual shareholder meeting.	405/454	0.786	88%
D.9	Audit committee (or internal auditor) meets with external auditor to review financial statements.	317/473	0.616	92%
	Elements that apply to firms with audit committees (n = 90)			
D.1	Outside directors comprise more than 2/3 of audit committee.	53/89	0.596	99%
D.3	Audit committee includes someone with expertise in accounting.	66/84	0.786	93%
D.6	Written minutes for audit committee meetings.	73/78	0.936	87%
D.8	Audit committee members attend at least 75% of meetings	64/67	0.955	74%
D.10	Audit committee meets two or more times per year.	57/71	0.803	79%
Disclosure Subindex				
E.1	Firm conducted investor relations activity in 2000.	20/515	0.039	100%
E.2	Firm website includes resumes of board members.	47/515	0.091	100%
E.3	English disclosure exists.	22/515	0.043	100%
	All elements of Disclosure Subindex	**515**		**100%**
Ownership Parity Subindex		**n.a./515**	**0.83**	**100%**

Table 2. Other Variables

This table describes the other dependent and independent variables used in this paper. Share values and related variables are measured at June 29, 2001. Share ownership is measured at year-end 2000. Book values, sales, and other 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 the period, we use the most recent fiscal year for balance sheet data and the most recent full fiscal year for income statement data. Book and market values are in billion won.

Variables	Description
Tobin's *q*	Estimated as market value of assets as [book value of debt + book value of preferred stock + market value of common stock]/book value of assets.
Market-to-Book Ratio	Market value/book value of common stock. We drop 5 firms with negative book value of common stock.
Market-to-Sales Ratio	Market value of common stock divided by sales.
Book Value of Debt	Book value of total liabilities.
Book Value of Assets	Book value of assets.
Market Value of Total Equity	Market value of common stock plus book value of preferred stock.
Debt/Equity	Book value of debt divided by market value of common stock.
Debt/Assets	Book value of debt divided by book value of total assets
Years Listed	Number of years since original listing.
Sales Growth	Geometric average growth rate of sales during the 5 fiscal years from 1996 through 2000 (or available period if less than five years).
R&D/Sales	Ratio of research and development (*R&D*) expense to sales. Assumed to be 0 for 137 firms with missing data for *R&D* expense.
Advertising/Sales	Ratio of advertising expense to sales. Assumed to be 0 for 65 firms with missing data for advertising expense.
Exports/Sales	Ratio of export revenue to sales. Assumed to be 0 for 66 firms with missing data for export revenue.
PPE/Sales	Ratio of property, plant and equipment to sales.
Capex/Sales	Ratio of capital expenditures to sales.
EBIT/Sales	Ratio of earnings before income and taxes to sales.
Share Turnover	Common shares traded during 2000 divided by common shares held by public shareholders (defined as common shares outstanding x (1 -Total Affiliated Ownership)).
Foreign Ownership	Foreign ownership of the firm's common shares divided by common shares outstanding.
Market Share	Firm's share of total sales by all firms in the same 4-digit industry listed on *KSE* or registered on *KOSDAQ*.
ADR (Level 1) Dummy	1 if firm has level 1 American Depository Receipts (ADRs); 0 otherwise. Source for ADRs: JP Morgan and Citibank websites.
ADR (Level 2/3) Dummy	1 if firm has issued level 2 or level 3 ADRs; 0 otherwise.
Sole Ownership	Percentage share ownership by largest shareholder (the shareholder that, together with its related parties, holds the largest number of common shares.
MSCI Index Dummy	1 if firm is in Morgan Stanley Capital International Index in May 2001; 0 otherwise
Total Affiliated Ownership	Percentage share ownership by all affiliated shareholders.

Variables	Description
Ownership Parity	1 - ownership disparity, where ownership disparity = total affiliated ownership - sole ownership (both measured as fractions)
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.
Chaebol Dummy	1 if a member of one of the top-30 business groups as of April 2000 as identified by Korea Fair Trade Commission; 0 otherwise, except that we treat Pohang Iron and Steel, a former state-owned enterprise, as a non-*chaebol* firm because its history is not similar to traditional family founded *chaebol* groups.
Industry Dummy Variables (4-digit except as noted)	Dummy variables for the 42 4-digit industries or 13 2-digit industries (based on *KIC* codes) represented in our sample.

Table 3. Descriptive Statistics

Descriptive statistics for the overall corporate governance indices and subindices and selected other variables used in this study.

Panel A. Corporate Governance Indices and Subindices

	Code	No. of Observ.	Mean	Stand. Dev.	Min.	Max.
Shareholder Rights Subindex	*A*	534	3.45	3.65	0.00	16.00
Board Structure Subindex	*B*	534	2.72	5.39	0.00	20.00
Board Procedure Subindex	*C, D*	534	8.80	2.90	1.11	17.60
Disclosure Subindex	*E*	534	1.12	3.01	0.00	20.00
Ownership Parity Subindex	*P*	525	16.60	2.80	6.40	20.00
Overall Corporate Governance Index	*KCGI*	525	32.63	11.59	12.73	86.93

Panel B. Other Variables

	No. of Observ.	No. of "1" values (for dummy variables)	Mean	Median	Standard Deviation	Minimum	Maximum
Tobin's *q*	533	--	0.85	0.81	0.28	0.32	3.04
Market/Book Ratio	527	--	0.84	0.50	1.64	0.06	21.61
Market/Sales Ratio	533	--	1.73	1.01	6.68	0.02	149.92
Market Value of Common Stock	534	--	359	41.33	1869	2.01	29038
Book Value of Common Stock	527	--	439	87.37	1807	0.93	31834
Book Value of Debt	533	--	1306	112	6069	1.23	77265
Book Value of Assets	533	--	1748	228	7023	10.26	81522
Sales	533	--	972	172	3497	2.21	40752
Debt/Equity	533	--	6.34	2.47	11.93	0.05	95.52
Debt/Assets	533	--	0.55	0.53	0.21	0.09	1.24
Years Listed	534	--	15.66	13.00	9.35	0.00	45.00
Sales Growth	519	--	0.11	0.08	0.16	-0.27	2.01
EBIT/Sales	529	--	0.05	0.06	0.10	-0.58	0.40
R&D/Sales	534	--	0.01	0.00	0.06	0.00	1.32
Advertising/Sales	534	--	0.01	0.00	0.02	0.00	0.13
Exports/Sales	534	--	0.26	0.13	0.30	0.00	1.00
PPE/Sales	529	--	0.51	0.41	0.48	0.00	5.73
Capex/Sales	529	--	0.06	0.03	0.09	0.00	1.02
Market Share	533	--	0.06	0.01	0.13	0.00	1.00
Share Turnover	525	--	10.01	5.86	14.70	0.23	239
Foreign Ownership	529	--	0.07	0.01	0.13	0.00	0.86
Sole Ownership	525	--	19.67	15.94	14.42	0.14	89.76
ADR (Level 1) Dummy	534	10	0.02	0	0.14	0	1
ADR (Level 2/3) Dummy	534	6	0.01	0	0.11	0	1
MSCI Index Dummy	534	65	0.12	0	0.33	0	1
Asset Size Dummy	533	67	0.13	0	0.33	0	1
Bank Dummy	534	13	0.02	0	0.15	0	1
Chaebol30 Dummy	534	109	0.20	0	0.40	0	1

Panel C. Correlation Matrix for Corporate Governance Index and Subindices

Correlations among our overall corporate governance index *KCGI*, each subindex, and asset size dummy. Sample size varies from 525 to 534. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. Statistically significant correlations (at 5% level or better) are shown in **boldface**.

	KCGI	Share holder Rights	Board Structure	Board Proce dure	Disclo sure	Owner ship Parity	Asset Size Dummy
KCGI	1.00						
Shareholder Rights Subindex	0.65***	1.00					
Board Structure Subindex	0.81***	0.32***	1.00				
Board Procedure Subindex	0.74***	0.41***	0.56***	1.00			
Disclosure Subindex	0.59***	0.26***	0.31***	0.29***	1.00		
Ownership Parity Subindex	0.37***	0.09**	0.11**	0.13***	0.08*	1.00	
asset size dummy	0.73***	0.32***	0.87***	0.52***	0.35***	0.05	1.00

Table 4. *OLS* for Corporate Governance Index with Different Control Variables

Ordinary least squares regressions of Tobin's *q*, market/book, and market/sales on Corporate Governance Index (*KCGI*) and control variables. Observations are identified as outliers and dropped based on a studentized residual obtained by regressing the dependent variable on *KCGI*, greater than ±1.96. *, **, and *** 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% or better) are shown in **boldface**.

	Tobin's *q*				market/book	market/sales
	(1)	(2)	(3)	(4)	(5)	(6)
Overall Index (*KCGI*)	**0.0059*** (8.23)**	**0.0073*** (7.07)**	**0.0059*** (5.62)**	**0.0064*** (6.12)**	**0.0131*** (4.70)**	**0.0123*** (4.73)**
Ln(assets)		**-0.0315*** (3.51)**	**-0.0362*** (3.17)**	**-0.0438*** (3.76)**	**-0.1748*** (4.58)**	-0.0340 (1.04)
Ln(years listed)		**-0.0413*** (3.40)**	**-0.0331*** (2.73)**	**-0.0333*** (2.70)**	-0.0472 (1.54)	**-0.0837** (2.52)**
Debt/Equity		**0.0020*** (3.24)**	**0.0027*** (3.89)**	**0.0032*** (4.44)**	**-0.0072*** (3.98)**	0.0026 (1.47)
Sales Growth		0.0787 (1.03)	0.0052 (0.07)	0.0191 (0.25)	0.0385 (0.17)	-0.3229 (1.60)
R&D/Sales		0.1610 (1.62)	**0.1839*** (2.67)**	**0.1800** (2.54)**	0.0936 (0.49)	0.0245 (0.27)
Advertising/Sales		0.9590* (1.72)	0.6996 (1.25)	0.6698 (1.21)	1.7134 (1.16)	2.0382* (1.73)
Exports/Sales		0.0025 (0.05)	-0.0299 (0.68)	-0.0352 (0.80)	-0.0059 (0.06)	-0.0099 (0.10)
PPE/Sales			**-0.1253*** (3.03)**	**-0.1208*** (2.94)**	-0.1685* (1.72)	**0.6815*** (4.52)**
$(PPE/Sales)^2$			**0.0215*** (2.74)**	**0.0210*** (2.66)**	0.0225 (1.06)	-0.0445 (0.65)
Capex/PPE			0.1204* (1.96)	0.1050* (1.76)	0.1439 (0.65)	0.2491 (1.35)
EBIT/Sales			0.0016 (0.01)	0.0378 (0.34)	0.3108 (1.15)	0.2086 (0.64)
Market Share			0.1444 (0.97)	0.0610 (0.37)	0.2868 (0.75)	-0.5304* (1.69)
Share Turnover			**0.0022** (2.57)**	**0.0022** (2.51)**	0.0023 (0.91)	0.0066* (1.74)
Foreign Ownership			**0.2841*** (3.21)**	**0.2790*** (3.26)**	**0.9991*** (4.80)**	**0.3542** (2.03)**
Chaebol30 Dummy			0.0392* (1.90)	0.0389* (1.87)	0.0462 (0.83)	0.0228 (0.38)
Sole Ownership			-0.0019 (1.06)	-0.0020 (1.13)	-0.0071 (1.50)	-0.0035 (0.77)
Sole $Ownership^2$			0.0000 (1.00)	0.0000 (1.10)	0.0001* (1.74)	0.0000 (0.06)
ADR (Level 1) Dummy				-0.0385 (0.58)	-0.1879 (1.52)	-0.1457 (0.77)
ADR (Level 2/3) Dummy				-0.0737 (0.80)	-0.0029 (0.02)	0.1892 (0.63)
MSCI Index Dummy				**0.0999*** (3.38)**	**0.3045*** (4.23)**	**0.2546*** (2.77)**
Bank Dummy				**-0.1759*** (2.85)**	-0.0241 (0.12)	0.7785 (1.62)
Intercept Term	yes	yes	yes	yes	yes	yes
Industry Dummies	no	4-digit	4-digit	4-digit	4-digit	4-digit
Sample Size	505	495	495	495	499	496
Adjusted R^2	0.1159	0.2546	0.3155	0.3343	0.3329	0.4855

Table 5. *OLS* Results for Subsamples

Ordinary least squares regressions of Tobin's *q* on *KCGI* for subsamples. Control variables are the same as in *Table 4*, regression (4), except that for smaller subsamples, we use 2-digit industry controls to preserve degrees of freedom and add a control variable for 4-digit market concentration (unavailable with 4-digit industry controls due to perfect colinearity). Regressions (2-3) omit bank dummy, regressions (4-5) omit *Chaebol30* dummy, and regression (10) omits industry controls. *, **, and *** 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% or better) are shown in **boldface**.

	Dependent variable	**Tobin's *q***						**Market/Book**	**Market/Sales**
		Sample Size	*KCGI*	*Ln*(assets)	Other Controls	Industry Dummies	Adjusted R^2	*KCGI*	*KCGI*
1	Entire Sample	495	**0.0060*** (5.81)**	**-0.0348*** (3.32)**	Yes	2-digit	0.3054	**0.0132*** (4.52)**	**0.0144*** (5.34)**
2	Non-Banks	482	**0.0060*** (5.73)**	**-0.0338*** (3.04)**	Yes	2-digit	0.2990	**0.0126*** (4.29)**	**0.0149*** (5.52)**
3	Non-financial, Non-regulated firms	468	**0.0062*** (5.53)**	**-0.0353*** (2.98)**	Yes	2-digit	0.2872	**0.0118*** (3.79)**	**0.0139*** (5.03)**
4	Chaebol firms	102	**0.0068*** (2.98)**	-0.0244 (0.91)	Yes	2-digit	0.3527	0.0084* (1.73)	0.0082 (1.53)
5	Non-Chaebol firms	393	**0.0055*** (4.51)**	**-0.0337** (2.55)**	Yes	2-digit	0.2892	**0.0120*** (3.22)**	**0.0167*** (4.79)**
6	Large firms (> 2 trillion won)	62	0.0045* (1.77)	-0.1123* (1.87)	Yes	2-digit	0.3551	0.0142* (1.91)	0.0184* (1.93)
7	Small firms (80 billion won < assets < 2 trillion won)	340	**0.0059*** (4.65)**	-0.0023 (0.15)	Yes	2-digit	0.3174	**0.0078*** (2.64)**	**0.0163*** (4.56)**
8	Smallest firms (assets < 80 billion won)	93	-0.0008 (0.19)	-0.1245* (1.72)	Yes	2-digit	0.1518	0.0132 (0.88)	0.0064 (0.70)
9	Non-manufacturing firms	147	**0.0052*** (3.19)**	-0.0161 (0.79)	Yes	2-digit	0.3005	**0.0141*** (2.93)**	**0.0213*** (3.83)**
10	Manufacturing firms	348	**0.0061*** (4.49)**	**-0.0400*** (3.02)**	Yes	2-digit	0.2702	**0.0119*** (3.30)**	**0.0110*** (3.70)**
11	More profitable firms (ROA > 5%)	249	**0.0047*** (3.14)**	-0.0185 (1.31)	Yes	2-digit	0.2976	**0.0109** (2.56)**	**0.0095*** (3.19)**
12	Less profitable firms (ROA < 5%)	246	**0.0060*** (4.27)**	**-0.0479*** (2.86)**	Yes	2-digit	0.3780	**0.0136*** (3.09)**	**0.0142*** (3.61)**

Table 6. Instrument Reliability: Differences in Adoption of 50% Outside Directors, Audit Committee, and Outside Director Nominating Committee

Proportion (percentage) of large and small firms which have at least 50% outside directors, an audit committee, and an outside director nominating committee. Sample size = 533. Most large firms are required to have these governance elements; small firms are not. *t*-test for difference in proportions is shown in parentheses in column (3). *** indicates significance at the 1% level. Statistically significant results in **boldface.**

Governance Element	(1) Small firms (assets < 2 trillion won)	(2) Large firms (assets > 2 trillion won)	(3) Difference: (3) = (2) - (1)
at least 50% outside directors	18/466 (3.9%)	65/67 (97.0%)	**93.2% (*t* = 19.66)**
audit committee	32/466 (6.9%)	62/67 (92.5%)	**85.7% (*t* = 17.20)**
outside director nominating committee	33/466 (7.1%)	52/67 (77.6%)	**70.5% (*t* = 14.74)**

Table 7. Asset Size Dummies and Corporate Governance

Regressions of *KCGI* and subindices on family of asset size dummy variables, where subdummy 1 = 1 if *ln*(assets) > 3.6 and 0 otherwise; subdummy 2 = 1 if *ln*(assets) > 4.6, and so on. Subdummy 5 corresponds to assets > 2 trillion won. The residual category of small firms (assets < 37 billion won) contains 17 firms. Other control variables are as in our base *OLS* regression, except 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 in **boldface**.

Dependent Variable	Firms in Size Range	(1) *KCGI*	(2) Shareholder Rights Subindex	(3) Board Structure Subindex	(4) Board Procedure Subindex	(5) Disclosure Subindex	(6) Ownership Parity Subindex	(8) Tobin's *q*
Asset subdummy 1	107	-2.3429	0.0187	-0.4045	-0.9384	-0.5605	-0.4581	0.1770*
(>37 billion won)		(1.27)	(0.02)	(0.70)	(1.61)	(0.88)	(0.66)	(1.88)
Asset subdummy 2	151	-0.1935	0.1514	-0.6165	0.7442	-0.3041	-0.1685	0.0554
(> 99 billion won)		(0.13)	(0.22)	(1.09)	(1.47)	(0.58)	(0.32)	(1.08)
Asset subdummy 3	96	-0.6742	0.1159	-0.0173	-0.2928	**-0.9839****	0.5039	**0.0763****
(> 270 billion won)		(0.46)	(0.18)	(0.03)	(0.62)	**(2.09)**	(0.93)	**(2.19)**
Asset subdummy 4	61	-1.0212	-0.1468	-0.4411	-0.0667	-0.2994	-0.0672	0.0454
(> 735 billion won)		(0.59)	(0.18)	(0.63)	(0.12)	(0.53)	(0.10)	(0.99)
Asset subdummy 5	***37***	***15.9006*****	*1.0353*	***12.0745*****	***2.0633*****	*0.3537*	*0.3737*	*0.0218*
(> 2 trillion won)		***(6.72)***	*(1.04)*	***(12.28)***	***(3.06)***	*(0.40)*	*(0.53)*	*(0.39)*
Asset subdummy 6	11	2.2731	1.4823	-1.7424*	1.0937	1.2905	0.1491	-0.1735
(> 5.43 trillion won)		(0.66)	(1.03)	(1.70)	(1.11)	(0.81)	(0.18)	(1.55)
Asset subdummy 7	14	-3.8558	-2.5396	-0.3126	-1.4370	-0.2561	0.6896	0.0649
(> 14.77 trillion won)		(1.03)	(1.33)	(0.20)	(1.39)	(0.12)	(0.70)	(0.48)
KCGI								**0.0057*****
								(4.95)
6 powers of ln(assets)								yes
other control variables	yes	yes	yes	yes	yes	yes	yes	yes
Industry Dummies	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit
Sample Size	495	495	495	495	495	495	495	495
Adjusted R^2	0.6418	0.2387	0.7709	0.3418	0.2456	0.1884	0.3620	0.6418

Table 8, Panel A. Two-Stage Least Squares Results for *KCGI*

Regression of Tobin's *q* on *KCGI*, estimated using two-stage (*2SLS*) regressions, with asset size dummy as an instrument for *KCGI*. The first stage regresses *KCGI* on asset size dummy plus all other exogenous variables. The second stage is estimated using the fitted value for *KCGI* from the first stage. Size control is ln(assets) except as shown. Regressions (4-5) are similar to regression (1), but use market/book and market/sales as dependent variables. Other control variables and treatment of outliers are the same as in our base *OLS* regression, except we exclude *MSCI* Index and *ADR* dummy variables due to high correlation with asset size dummy. *, **, 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)
	1st stage *KCGI*	2nd stage Tobin's *q*	1st stage *KCGI*	2nd stage Tobin's *q*	2nd stage Tobin's *q*	2nd stage market/book	2nd stage market/sales
Instrumented *KCGI*		**0.0097*** (4.52)**		**0.0098** (2.83)**	**0.0083*** (3.36)**	**0.0252*** (4.61)**	**0.0242*** (3.72)**
Asset size dummy	**16.4694*** (8.32)**		**14.0074*** (4.28)**				
Ln(assets)	**1.4149*** (2.95)**	**-0.0456*** (3.58)**				**-0.1872*** (4.99)**	-0.0442 (1.28)
6 powers of *ln*(assets)	no	no	yes	yes	no	no	no
6 powers of *ln*(sales)	no	no	no	no	yes	no	no
Other Control Variables	yes	yes	yes	yes	yes	yes	yes
Industry Dummies	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit	4-digit
Sample Size	495	495	495	495	495	499	495
Adjusted R^2	0.6432	0.3073	0.6424	0.3292	0.3398	0.2863	0.4534

Table 8, Panel B. Two-Stage Least Squares Results for Board Structure Subindex

Two-stage least squares regressions of Tobin's *q* on Board Structure Subindex, similar to *Panel A*. Regression (1) substitutes Board Structure Subindex for *KCGI*. Regression (2) adds (KCGI - Board Structure Subindex) as an additional control variable. *, **, 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)	
	1st stage Board Structure Subindex	2nd stage Tobin's *q*	1st stage Board Structure Subindex	2nd stage Tobin's *q*
Instrumented Board Structure Subindex		**0.0133*** (4.19)**		**0.0112*** (3.70)**
Asset size dummy	**12.0516*** (14.44)**		**11.8621*** (14.01)**	
Ln(assets)	0.2090 (1.04)	**-0.0346*** (2.85)**	0.1572 (0.78)	**-0.0412*** (3.45)**
KCGI - Board Structure Subindex			**0.0429** (2.41)**	**0.0059*** (4.66)**
Other Control Variables	yes	yes	yes	yes
Industry Dummies	4-digit	4-digit	4-digit	4-digit
Sample Size	495	495	495	495
Adjusted R^2	0.7695	0.2861	0.7714	0.3235

Table 9. Corporate Governance and Firm Profitability

OLS regressions of profitability and accounting variables on *KCGI*. The table shows the coefficients on *KCGI* for dependent variables with different measures of profit in the numerator (ordinary income (basically earnings before taxes and extraordinary items), *EBIT*, and *EBITDA*), and also sales, capital expenditures, and dividends, with denominators as shown. Control variables are the same as our base *OLS* regression, except that we omit the following variables, which lack a connection to profitability: share turnover, foreign ownership, *ADR* dummies, and *MSCI* dummy. We replace debt/equity with debt/assets for regressions with equity measures in the denominator, and drop sales growth as a control variable for regressions with sales in the numerator. Observations are identified as outliers if a studentized residual from regressing the dependent variable on *KCGI* is greater than ±1.96. Sample size varies from 487 to 521. *, **, 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.**

Denominator	Numerator					
	EBITDA	EBIT	Ordinary Income	Sales	Capital Expenditures	Dividends
Sales	0.0006 (1.50) adj. R^2=0.2472	0.0005 (1.27) 0.2269	-0.0008 (1.62) 0.2253		0.0000 (0.11) 0.2319	-0.0104* (1.72) 0.1817
Book Value of Total Equity	0.0014 (1.01) 0.2400	0.0023* (1.70) 0.2248	-0.0045 (1.32) 0.2680	0.0249 (0.97) 0.2029	0.0002 (0.28) 0.3538	0.0052 (0.55) 0.1998
Book Value of Assets	-0.0002 (0.63) 0.2343	-0.0002 (0.74) 0.1992	-0.0006* (1.68) 0.2384	-0.0020 (1.56) 0.6057	-0.0002 (1.28) 0.3396	-0.0051 (1.06) 0.2350
Market Value of Total Equity	**-0.0050**** **(2.21)** 0.3222	-0.0033* (1.66) 0.3260	-0.0017 (0.71) 0.2695	**-0.1141***** **(6.03)** 0.4277	**-0.0054***** **(3.67)** 0.1855	-0.0335* (1.74) 0.1691
Market Value of Assets	**-0.0010***** **(2.90)** 0.2346	**-0.0009***** **(2.91)** 0.1984	**-0.0014***** **(3.43)** 0.2241	**-0.0132***** **(5.27)** 0.4080	**-0.0005**** **(2.19)** 0.2761	**-0.0113**** **(2.09)** 0.2176

Table 10. *OLS* Results for Subindices

Ordinary least squares regressions of Tobin's *q* on *KCGI* and each subindex. Control variables and sample (n = 494) are the same as in our base *OLS* regression. In row (1), we replace *KCGI* with the indicated subindex, *without* a separate control for the rest of the corporate governance index. In row (2), we add a control variable for a "Reduced Index" which equals the sum of the other four subindices. In row (3), we include all five subindices as separate independent variables. *, **, 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. Adjusted R^2 is shown for each regression. Significant results (at 5% level or better) are shown in **boldface**.

	KCGI or Subindex	*KCGI*	Shareholder Rights Subindex	Board Structure Subindex	Board Procedure Subindex	Disclosure Subindex	Ownership Parity Subindex
dependent variable: Tobin's *q*							
1	Coefficient on subindex (substituted for *KCGI*)	**0.0064*** (6.12) 0.3343**	**0.0066*** (2.77) 0.2832**	**0.0089*** (3.73) 0.2973**	**0.0116*** (3.15) 0.2906**	**0.0084*** (3.23) 0.2839**	**0.0133*** (3.99) 0.3000**
2A	Coefficient on subindex, with control for Reduced Index		0.0040* (1.73) 0.3345	**0.0070*** (3.08)** 0.3329	0.0051 (1.31) 0.3330	**0.0060** (2.43)** 0.3328	**0.0106*** (3.29)** 0.3357
2B	Coefficient for Reduced Index (sum of remaining subindices) (from same regression as column *2A*)		**0.0072*** (5.62)** 0.3345	**0.0062*** (5.14)** 0.3329	**0.0067*** (5.06)** 0.3330	**0.0065*** (5.51)** 0.3328	**0.0057*** (4.80)** 0.3357
3	Coefficients from single regression with all subindices		0.0043* (1.73) 0.3320	**0.0068*** (2.92)** 0.3320	0.0052 (1.33) 0.3320	***0.0062*** (2.48)** 0.3320	**0.0105*** (3.25)** 0.3320

Table 11. *OLS* Results for Individual Elements of *KCGI*

Ordinary least squares regression results for individual governance elements. The elements are defined in *Table 1*, except that for audit committee elements (D1, D3, D8, D10), we treat missing values for firms without an audit committee as zero. Control variables are the same as in our *base OLS regression*. The "alone" column gives the coefficient from a regression without other governance variables. The "w. controls for *KCGI*" column gives the coefficient with controls for the remainder of *KCGI* as follows. For element *A1*, we include (1) a Reduced Index (*KCGI* - Shareholder Rights Subindex), and (2) a Reduced Subindex (consisting of the other four elements of Shareholder Rights Subindex), and similarly for other elements. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. Significant results (at 5% level or better) are shown in **boldface.** *t*-values, based on White's heteroskedasticity-consistent standard errors, are reported in parentheses. Sample sizes are reported in brackets.

	Element	Alone	w. controls for *KCGI*		Element	Alone	w. controls for *KCGI*
A1	Cumulative voting for	0.0174	0.0171	C12	Outside directors attend 75% of	0.0075	-0.0054
[495]	directors	(0.47)	(0.48)	[432]	meetings on average	(0.41)	(0.32)
A2	Firm allows voting by mail	-0.0115	-0.0383	C13	Firm has code of conduct for	0.0329	0.0129
[495]		(0.45)	(1.62)	[495]	outside directors	(1.17)	(0.47)
A3	Shareholder meeting date	0.0243	0.0119	C14	Firm has contact person to	0.0226	0.0051
[471]	encourages attendance	(1.00)	(0.54)	[495]	support outside directors	(1.38)	(0.31)
A4	**Director candidates**	**0.0765*** **	**0.0596*** **	C15	Firm holds board meeting solely	0.0584	0.0189
[495]	**disclosed before sh. meeting**	**(3.57)**	**(2.94)**	[495]	for outside directors	(1.19)	(0.43)
A5	Board approval for related	0.0226	0.0204	C16	Firm doesn't lend funds to	-0.0872	-0.0683
[495]	party transactions	(1.34)	(1.23)	[495]	outside directors to buy shares	(0.73)	(0.63)
B1	**Firm has at least 50%**	**0.1630*** **	**0.1294*** **	D1	More than 2/3 outside directors	0.0210	-0.0541
[495]	**outside directors**	**(4.67)**	**(3.07)**	[495]	on audit committee	(0.60)	(1.55)
B2	Firm has more than 50%	0.0909*	0.0361	D2	Bylaw exists for audit	**0.0440** **	0.0352*
[495]	outside directors	(1.88)	(0.82)	[452]	committee or internal audit	**(2.25)**	(1.91)
B3	Firm has outside director	0.0536*	0.0102	D3	Audit committee includes	**0.0784** **	0.0074
[495]	nominating committee	(1.83)	(0.34)	[495]	accounting expert	**(2.45)**	(0.24)
B4	Firm has audit committee	**0.0610** **	0.0054	D4	Audit comm. or internal auditor	0.0015	-0.0015
[495]		**(2.04)**	(0.16)	[458]	chooses external auditor	(0.07)	(0.07)
C1	Directors attend 75% of	0.0272	0.0104	D5	Audit comm or internal auditor	0.0109	0.0097
[452]	meetings on average	(1.46)	(0.59)	[375]	approves head of internal audit	(0.51)	(0.47)
C2	Directors positions on agenda	0.0287*	0.0161	D6	Firm has written minutes for	0.0570*	-0.0301
[495]	items recorded in minutes	(1.70)	(1.00)	[495]	audit committee	(1.67)	(0.88)
C3	CEO and board chairman are	0.0505	0.0438	D7	Report to shareholder meeting	0.0050	-0.0037
[495]	different people	(1.16)	(1.07)	[437]	on audit comm./internal audit	(0.17)	(0.13)
C4	System for evaluating	0.0416	0.0147	D8	Audit committee members	**0.1296*** **	0.0603*
[495]	directors exists	(1.62)	(0.60)	[495]	attend 75% of meetings on avg.	**(3.84)**	(1.81)
C5	Bylaw to govern board	0.0120	-0.0007	D9	Audit comm./internal auditor	0.0301*	0.0208
[495]	meetings exists	(0.63)	(0.04)	[454]	meets with external auditor	(1.67)	(1.18)
C6	Firm holds 4 or more regular	0.0168	0.0071	D10	Audit committee meets 2 or	**0.0971*** **	0.0321
[325]	board meetings per year	(0.70)	(0.29)	[495]	more times per year	**(2.72)**	(0.95)
C7	Firm has one or more foreign	-0.0446	-0.0487	E1	Firm conducted investor	0.0831*	0.0365
[495]	outside directors	(1.30)	(1.42)	[495]	relations activity in 2000	(1.86)	(0.88)
C8	Outside directors do not	0.0247	0.0206	**E2**	**Firm website includes**	**0.0737** **	0.0536*
[295]	receive retirement pay	(0.81)	(0.73)	**[495]**	**resumes of board members**	**(2.40)**	(1.95)
C9	Outside directors can hire	0.0148	-0.0169	E3	English disclosure exists	0.0154	0.0164
[295]	advisors at company expense	(0.54)	(0.63)	[495]		(0.44)	(0.48)
C10	Firm has or plans system to	0.0290	0.0091	**P**	**Ownership parity**	**see *Table 10***	
[471]	evaluate outside directors	(1.57)	(0.51)	[495]			
C11	Shareholders approve outside	-0.0437	-0.0342				
[432]	directors' aggregate pay	(1.31)	(1.03)				

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