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**ABSTRACT**

Prior work in emerging markets provides evidence that better corporate governance predicts higher firm market value, but little evidence on the channels through which governance affects market value. We first show that higher scores on a Korean Corporate Governance Index (KCGI) predict higher Tobin's *q*, principally through a board structure subindex, with strong evidence of causation due to 1999 board structure reforms. The board structure reforms then induce improved disclosure. We then provide evidence that governance predicts reduced cash-flow tunneling by controllers and improved capital allocation decisions. For the tunneling channel, higher volume of related party transactions (RPTs) predicts lower Tobin's *q*; KCGI moderates this effect. For *chaebol* firms (where we have counterparty identities), we find this effect only for firms with positive scores on an Expropriation Risk Index (ERI), which measures controllers' incentives to tunnel. Higher KCGI also predicts higher sensitivity of firm profitability to industry profitability. This effect is again limited to firms with positive ERI. For the capital allocation channel, higher KCGI predicts (a) lower investment and greater sensitivity of investment to profitability; (b) slower sales growth and greater sensitivity of growth to profitability; and (c) higher and more profit-sensitive dividends. We link these results to the subindices of KCGI, principally board structure, which predict higher Tobin's q. Lagged board structure also predicts higher profitability.

*Key words*: Korea, corporate governance, corporate governance index, law and finance, firm valuation, emerging markets

*JEL classification*: G32, G34

## 1. Introduction

There is evidence that firm level corporate governance affects firm market value in emerging markets, but little evidence on the "channels" – the ways in which governance affects firm behavior – through which market value is created.[1] The principal goal of this paper is to provide evidence on these channels. We study Korea because (uniquely), Korea allows reasonable identification of a causal link between governance and firm market value, based on a shock to the governance of large firms: a 1999 law requires firms with assets over 2 trillion won (about $2 billion) to have at least 50% outside directors, an audit committee with an outside director as chair and at least two-thirds outside members; and an outside director nominating committee. In prior work, we find evidence that this legal shock causally predicts higher market value for large firms, relative to mid-sized firms (Black and Kim, 2012).

Here, we first report additional evidence on the connection between firm-level corporate governance and market value, using panel data from 1998-2004 with firm fixed and random effects. We construct a broad corporate governance index (Korea Corporate Governance Index, or *KCGI*), comprised of five subindices, for Board Structure, Ownership Parity, Disclosure, Shareholder Rights, and Board Procedures. The power of *KCGI* to predict Tobin's *q* is driven by Board Structure Subindex (for which the legal shock provides a good instrument) and, less strongly, by the Ownership Parity and Disclosure subindices.[2]

We then turn to the core aim of this paper, to provide evidence on channels through which governance affects firm behavior, and thus firm value. We find evidence supporting three broad effects. First, we find evidence that the board structure reforms causally predict at least some other governance changes, especially better disclosure. The 1999 reforms thus predict market value both directly (board structure predicts market value) and indirectly by affecting disclosure, which in turn predicts market value.

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[1] To address some reader confusions: An effect of governance on share price is *not* a channel. Instead, it is a *result* we seek to explain by exploring how governance affects firm behavior, which might then explain why governance affects share price. Lower cost of capital (the inverse of share price) is similarly a result to be explained, and not a channel. In an efficient market, higher governance *levels* may predict higher share *prices*, but should not predict higher *returns*. Instead, investors should anticipate how governance will affect value, so any price impact should occur primarily when the governance *change* occurs. In prior work (Black and Kim, 2011), we find evidence consistent with an efficient investor reaction to governance changes -- investors react positively to legally mandated governance changes when the reforms are adopted, followed by normal returns.

[2] We use the term "predict" to mean statistical association in a firm-fixed effects framework. We use "causally predict" to describe results for which we have reasonable identification, based on the 1999 legal shock.

Second, better governance predicts reduced cash-flow tunneling by controllers (using the tunneling terminology of Atanasov, Black and Ciccotello, 2011). This implies a wealth transfer from controllers to outside shareholders, but perhaps no change in *total firm value*, defined as the sum of (i) observed market value, based on the trading prices of minority shares, and (ii) the unobserved private value of controlling shares. We find evidence for wealth transfer primarily for firms whose counterparty identities suggest controllers have incentives to transfer from these firms to their counterparties. Related party transactions (RPTs) predict lower firm market value, but governance moderates this effect: As a firm's *KCGI* score increases, RPTs become less adverse to firm value. The moderating effect of *KCGI* is driven primarily by Board Structure Subindex (both directly and using the 1999 legal shock as an instrument).

For *chaebol* (Korean business group) firms, we have data on the controller's ownership in both participants in the RPT, so can compute an "Expropriation Risk Index (ERI)" based on the controllers relative cash flow stakes in the firm and its RPT counterparties. RPTs adversely affect value, and *KCGI* moderates this effect, in firms where the controlling family holds on average a smaller fraction of cash-flow rights in the firm than its counterparties (and thus has an incentive to set prices to the firm's detriment) (positive ERI), but not for firms where the controllers hold on average larger cash flow rights in the firm than in its counterparties (negative ERI). We also find that better governance predicts higher sensitivity of firm profitability to industry profitability, which suggests lower tunneling (Bertrand, Mehta, and Mullainathan, 2002). For chaebol firms, this effect exists only for firms whose controllers have an incentive to tunnel, as measured by ERI. We thus find evidence of cash flow tunneling at those firms where, based on their RPT counterparties, one would expect such tunneling, and *only* those firms. Moreover, investors, if given the data to do so, can discriminate between firms that are at high risk for cash-flow tunneling and those at lower risk.

Third, better governance predicts changes in capital allocation decisions, in ways which seem likely to increase total firm value. As a firm's *KCGI* score increases, (i) capital expenditures are lower (on the link between poor governance and overinvestment, see Billett, Garfinkel and Jiang, 2011); (ii) capital expenditures are more sensitive to profitability; (iii) sales growth is lower, and (for Board Structure, but not KCGI overall) more sensitive to profitability; (iv) dividends are higher, controlling for profits, and are more sensitive to profitability; and (v) lagged Board Structure Index predicts higher profitability. Lower capital expenditures and

slower growth are likely to be value increasing for many firms, given evidence of widespread overinvestment and overexpansion by Korean firms, especially *chaebol* firms (see the survey by Kim and Kim, 2008). These results, taken together, suggest better capital allocation and growth decisions. The subindices which predict Tobin's *q* also drive these results. This is consistent with these channels helping to explain the overall relationship between governance and firm market value.

We thus provide evidence which: (ii) links governance changes to market value changes; (ii) links exogenous board structure changes to other governance changes; (iii) links governance to reduced cash-flow tunneling at those firms at high risk for tunneling; and (iv) links governance to improved, more profit sensitive, capital allocation. We do so in a strong empirical framework, with firm fixed effects and a good instrument, based on an external legal shock, for Board Structure Subindex.

This paper is organized as follows. Section 2 reviews the prior literature on the connection in emerging markets between firm-level governance and firm value or performance. Section 3 describes our data sources, how we construct our governance index and subindices, and some methodology issues. Section 4 presents our "governance to value" results on the connection between KCGI and Tobin's *q*. Section 5 assesses to what extent the shock to board structure predicts changes in other aspects of governance. Section 6 presents our self-dealing results. Section 7 presents our firm performance results. Section 8 concludes.

## 2. Literature Review

We focus here on emerging markets, and put aside the large literature on the link between corporate governance and firm value in developed markets (e.g., Aggarwal, Erel, Stulz and Williamson, 2010; Bebchuk, Cohen and Ferrell, 2009; Bruno and Claessens, 2007; Cremers and Ferrell 2009; Gompers, Ishii and Metrick, 2003). Different aspects of corporate governance are likely important in emerging markets such as Korea, where almost all firms have a controlling shareholder and insider self-dealing is a core concern, than in developed markets, especially markets like the U.S. and U.K. where many firms have dispersed ownership. We focus on firm-level governance, and put aside studies of country-level governance and event studies of changes in corporate governance rules. We emphasize studies which examine an overall measure of

corporate governance, rather than a single attribute (such as board independence or insider ownership). We do not review cross-listing studies or accounting studies which link governance to earnings management or earnings informativeness.

### 2.1. Governance to Value Studies

A number of studies report an association between an overall measure of corporate governance and firm market value, usually proxied by Tobin's *q*. The principal cross-country studies are Klapper and Love (2004) and Durnev and Kim (2005). There are also single-country studies on Brazil (Braga-Alves and Shastri, 2011; Black, de Carvalho and Gorga, 2011); Hong Kong (Cheung, Connelly, Limpaphayom and Zhou, 2007); Korea (Black, Jang and Kim, 2006a); India (Balasubramanian, Black and Khanna, 2010); Russia (Black, 2001; Black, Love and Rachinsky, 2006); and Thailand (Limpaphayom and Connelly, 2004). However, Korea aside, all of these studies lack identification, and most either lack time series data on governance, or, despite panel data, rely primarily on pooled *OLS* regressions.

Several papers study share returns during the 1997-1998 Asian financial crisis. Mitton (2002) finds better share price performance for better-disclosing firms in crisis-affected countries. Lemmon and Lins (2003) find higher returns for firms with low control-ownership disparity. Baek, Kang, and Park (2004) find both effects for Korean firms.

### 2.2. Channels Through Which Governance Affects Value

Studies of the channels through which governance may affect firms' market values or overall value are limited. One needs, in effect, to first connect governance to firm value, and then to identify particular aspects of firm behavior which plausibly explain the governance-to-value connection. The studies cited in the previous section connect governance to value. The studies discussed below find an association between aspects of governance and firm behavior. Few do both.

Klapper and Love (2004) and Mitton (2004) report an association between the Credit Lyonnais Securities Asia (CLSA) governance index and firm profitability; Klapper and Love also

link this index to firm market value. However, the *CLSA* index is based on a 2001 survey of analysts, which depends significantly on their subjective views and includes some questions which relate more to management quality than to governance. Thus, analysts might be giving higher "governance" scores to firms which have performed better.[3] Joh (2003) finds that Korean *chaebol* firms with high control-ownership disparity have lower profitability during the pre-crisis period.

For Korea, Bae et al. (2012) report that firms with high disparity between the controller's voting and cash flow rights suffer larger share price drops during the East Asian financial crisis (plausibly due to higher tunneling), and recover faster when the crisis abates. Bae, Kang, and Kim (2002) find that mergers with related parties are adverse to firm value; and Baek, Kang, and Lee (2006) find that equity offerings to insiders of Korean firms are at discounted prices.

Mitton (2004), using the CLSA index, finds a link between governance and dividend payout primarily in countries with strong investor protection. Higher *CLSA* scores also predict a stronger negative relationship between dividends and growth opportunities. Hwang, Park, and Park (2004) find an association between the governance of Korean firms (based on a 2003 Korea Corporate Governance Service (*KCGS*) survey) and dividends; higher KCGS scores moderate *chaebol* firms' tendency to pay lower dividends.

A cross-country study by Dahya, Dimitrov and McConnell (2007) finds that firms with a higher proportion of independent directors have higher Tobin's *q* and are less likely to engage in related party transactions. Liu and Lu (2007) find for Chinese firms that better governance is associated with less earnings management, and likely with lower levels of tunneling.

### 2.3. Our Related Research on Korea

This paper is part of a series on Korean corporate governance. In Black, Jang and Kim (2006a) (*BJK*) we use only cross-sectional data from 2001. We develop the *KCGI* index for 2001, develop and justify large firm dummy (=1 if firm has assets > 2 trillion won, 0 otherwise)

[3] The CLSA questions are summarized in an Appendix to Klapper and Love (2004).

as an instrument for either Board Structure Subindex or all of *KCGI* (it was unclear which was preferable) with only cross-sectional data, and report evidence of (i) a governance-to-value association between *KCGI* and firm market value, and (ii) likely causation for large firms, using the large firm instrument. Black, Jang and Kim (2006b) study firms' governance choices and find evidence of a large role for idiosyncratic firm choice. Black and Kim (2011) extend the KCGI index back to 1996 and forward to 2004, show that large firm dummy is best understood as an instrument for Board Structure Subindex, rather than all of *KCGI*, and tighten the causal link between the legal shock to Board Structure and higher firm market values, using a combination of identification strategies. In this paper, we build on the identification results in Black and Kim (2011), and study the channels through which governance affects value.

## 3. Index Construction, Data, and Identification

### 3.1. Index Construction and Data Sources

Relying primarily on a combination of hand-collection and annual surveys by the Korea Corporate Governance Service (KCGS), we construct a Korean corporate governance index (*KCGI*) from 1998 to 2004, covering the vast majority of public companies listed on the Korea Stock Exchange.[4] *KCGI* (0 ~ 100) consists of five equally weighted subindices, for Board Structure, Disclosure, Shareholders Rights, and Board Procedure, and Ownership Parity. We have data at mid-2001, and year-ends 1998-2004 – a total of eight time points.

We made unavoidable judgment calls in deciding which elements to include in the index, how to define these elements, and which elements to include in which subindices. The elements and subindices cover aspects of governance which we judged to be potentially important in Korea. During this time period, almost all Korean firms had a controlling shareholder or group. Thus, takeover defenses were irrelevant and rarely used. As a result,

[4] We exclude banks from regressions with Tobin's *q* as the dependent variable. Banks have high leverage, so Tobin's *q* is insensitive to governance. We exclude all financial institutions in regressions with capital expenditures as dependent variable, because capex is not a useful measure of activity for these firms.

our index is quite different from U.S.-centric indices, which focus heavily on takeover defenses (e.g., Gompers, Ishii and Metrick, 2004; Bebchuk, Cohen, and Ferrell, 2009).

We face important challenges in constructing the multiyear index. *KCGS* changed its survey questions each year, and for some questions switched in 2003-2004 from relying on survey responses to reviewing firms' public disclosures, even though disclosure is not required. We reduce loss of governance elements due to changes in the survey by hand-collecting data from annual reports, charters, proxy statements, company websites, and other sources. To reduce the cost of hand-collection, we generally assume that firms which lacked a governance element in year *t* also lacked this element in previous years. For elements that became legally required during this period, we assume that firms comply with these requirements. Board composition data comes from annual books published by the Korea Listed Companies Association (*KLCA*). Table 1 provides details on how we construct each element.[5]

Within each subindex, all elements are equally weighted, except that (i) Board Structure Subindex is composed of Board Independence Subindex (2 elements, 0 ~ 10), and Board Committee Subindex (3 elements, 0 ~ 10); and (ii) Ownership Parity Subindex has a single element. If data on a subindex element is missing for a particular firm, we compute the subindex using the average of the nonmissing elements. Table 2, Panel A provides summary statistics for *KCGI* and each subindex; Panel B provides correlation coefficients. All subindices are strongly correlated with each other, except for Ownership Parity, which is weakly and often negatively correlated with other subindices.

[5] English translations of the KCGS surveys are available from the authors on request. The first survey, conducted in 2001, did not specify the time on which survey respondents should base their answers. We assume that the answers reflect governance in mid-2001, when the survey was conducted. Where hand-collection is infeasible, we extrapolate from the nearest available year. We extrapolate two elements from 2001 to 1998-2000; one element forward from 2001 to 2002-2004; and 3 elements forward from 2003 to 2004. For five elements, we use an average of mid-2001 and 2002 values as the year-end 2001 value. We similarly interpolate for specific elements at specific firms with missing data in year *t* but not adjacent periods. This extrapolation and interpolation should be reasonably innocuous because (i) we use firm clusters in all regressions to address correlated observations of the same firm in different years; and (ii) in our firm fixed effects specification, only governance changes over time should affect our results. Extrapolation and interpolation (compared to the unobserved true state) should add noise to our results, but should not create bias. In robustness checks, we obtain similar results if we do not interpolate for elements or firms.

Data on other variables comes from various sources. We take balance sheet, income, cash flow statement data, foreign ownership data, related-party transactions, and original listing year from the *TS2000* database maintained by the KLCA; adjusted return data from the Korea Securities Research Institute (KSRI) database; information on *chaebol* groups from the Korea Fair Trade Commission (KFTC); other stock market data from the KSE; information on *ADRs* from JP Morgan and Citibank websites; and industry classification from the Korea Statistics Office (KSO). Share ownership for financial institutions comes from KSE. For non-financial firms, we use a database hand collected by one of us covering non-financial firms listed on the KSE from 1996 to 2001, which breaks down shareholdings into family (including the group controlling shareholder), affiliated firms, non-profit organizations, and company executives. Table 3 defines (Panel A) and gives summary statistics (Panel B) for the principal variables used in this study.

### 3.2. Methodological Issues

Research on whether there is a causal connection between corporate governance and firm value or performance faces a set of empirical challenges to identification (Chidambaran, Palia and Zheng, 2006; Lehn, Patro and Zhao, 2007).

The potential "endogeneity" problems include: (i) reverse causation, in which firm performance predicts board structure, rather than vice versa; (ii) omitted variable bias, in which an omitted variable predicts both governance and Tobin's *q*; (iii) optimal governance varying based on firm characteristics; and (iv) firms may use governance to signal good underlying attributes, but governance has no separate effect on value or performance. A further problem is limited data. To strengthen the case for causation, even without good identification, one would want to use panel data and firm fixed effects to control for unobserved time-invariant firm characteristics. Yet most research relies on cross-sectional regressions, either because time series data is not available or because there is too little time variation in governance to make firm fixed effects feasible. One also wants data on multiple aspects of governance. Different

aspects of governance are often positively correlated. One important omitted variable in studies of one aspect of governance (say board independence or disclosure) is the rest of governance.

A further issue is construct validity. What matters in corporate governance varies across countries, so one ideally wants governance measures that reflect local rules and practices (Bebchuk and Hamdani, 2009; Black, de Carvalho and Gorga, 2011; Durnev and Fauver, 2007). Data limitations and construct validity concerns are acute for cross-country studies, due to data limitations in the available multicountry governance measures and databases.

In this paper, we seek to directly confront these issues. Rich data on Korean firms, plus rapid post-East-Asian-crisis evolution in governance, make a panel data approach with firm fixed effects feasible. In our principal regressions, we use firm fixed effects to address unobserved time-invariant firm level factors that could affect our dependent variable, year dummies to address variation over time that is common to all firms, and an extensive battery of control variables (listed in Table 4) to address time-varying factors. The control variables are intended to capture factors that are likely to affect Tobin's $q$, including growth opportunities, profitability, existence of intangible, off-balance-sheet assets, and capital intensity, See Black, Jang and Kim (2006) for a fuller discussion of our controls. We use a detailed Korea-specific governance index. This doesn't ensure that what we call "governance" is what really matters for Korea firms, but improves the odds that we have respectable construct validity. We use firm clusters to address correlation between observations of the same firm in different years.

### 3.3. Identification for Large Firms and Board Structure Index

We have reasonable identification for Board Structure Index – which is only part of KCGI, but an important part. Before the 1997-1998 East Asian financial crisis, most Korean firms had no outside directors and only a few banks and majority state-owned enterprises (SOEs) had 50% outside directors. Legal reforms in 1998 required all public firms to have at least 25% outside directors. Further reforms in 1999 made it possible for firms to have board committees, including audit committees, and required large firms (assets > 2 trillion won, about $2 billion) to

have at least 50% outside directors, an audit committee, and an outside director nominating committee. The large firm rules came into force partly in 2000 and fully in 2001.

This shock to board structure allows us to identify how the change in large firms' board structure causally affected Tobin's *q* and firm performance. Consider Tobin's *q* first. In an efficient market, investors should anticipate the effect of governance changes on firm behavior and value, so share prices should change in 1999, when the rules were adopted. Thus, an event study of key legislative events should capture the predicted effect of the reforms. A difference-in-differences (DiD) analysis of Tobin's *q*, where one measures changes in Tobin's *q* to large firms from just before the reforms to just after completion of the reforms, with mid-sized firms as the control group, should also capture the predicted effect of the reforms. An instrumental variables (IV) analysis, with "Large Firm *IV 1999*" (=1 if large firm dummy =1 and year is 1999 or later, 0 otherwise) as an instrument for Board Structure Subindex is mathematically very similar in structure to a DiD analysis. Black and Kim (2011) find strong evidence from all three approaches that investors reacted favorably to the reforms. We use similar DiD and IV approaches here.

We discuss identification in detail in Black and Kim (2012), and only summarize here. First, the coefficients on instrumented Board Structure Subindex from an IV analysis are basically a rescaled estimate of the "average treatment effect" in a DiD analysis. They provide an estimate of the impact of the 1999 reforms on large firms, relative to a control group of mid-sized firms. A valid instrument in 2SLS (and similarly, valid inference from a DiD design) must be exogenous, correlated (ideally strongly) with the instrumented variable (Board Structure Index), and should predict the dependent variable only indirectly through the instrumented variable, and not directly. We consider each requirement in turn.

Large Firm *IV 1999* is reasonably exogenous. The 1999 rules are mandatory, and cause a large change in board structure at affected firms. They do not merely reflect large firm behavior prior to the rules' adoption. Figure 1 shows the evolution of Board Structure Index over 1998-2004 for large firms, mid-sized firms (assets from 0.5-2 trillion won) and small firms

(assets < 0.5 trillion won). The vertical line shows the 2 trillion won threshold; the horizontal line at a score of 11.67 shows the minimal score for large firms that comply with the rules. In 1998, only one large firm has a nonzero score on Board Structure Index. After the reforms, large firms universally comply with the new rules; some come into compliance in 1999 and 2000, ahead of the deadline. Some overcomply and are therefore above the horizontal line. We search for and find no evidence that firms reduce or limit their size to avoid the rules. Some mid-sized firms also change their board structures. There is a rise over time in the number of mid-sized firms who fully or partially meet the large firm rules, and in the number of large firms that overcomply. Thus, we have, in effect, a "fuzzy" regression discontinuity design: all firms above the threshold are treated, but some firms below it voluntarily adopt the treatment as well. Over time, as more mid-sized firms adopt the large firm reforms, the design becomes fuzzier, and thus our statistical power becomes weaker.

Second, Large Firm *IV 2000* (=1 if large firm dummy =1 and year is 2000 or later) correlates strongly with Board Structure Subindex: annual correlations from 2000-2004 are 0.79 or higher.[6]

A harder question for instrument validity is whether Large Firm *IV 1999* predicts Tobin's *q* directly or only indirectly through Board Structure Subindex. Large firm dummy is associated with firm size, which may directly predict both governance and firm value. We address this concern through regression discontinuity analysis, in which we control separately for firm size. Both governance and Tobin's *q* jump discontinuously at the 2 trillion won regulatory threshold. This jump appears in mid-1999 when the rules are adopted and is stable afterwards. Moreover, the direct association between *ln*(assets) and Tobin's *q* is negative, both below and above the threshold. The negative coefficient on *ln*(assets) implies that larger firms are progressively worse at turning asset dollars into market value dollars. In contrast, the association between Tobin's q and Large Firm *IV 1999* is large and positive. It is unlikely that

[6] We measure correlation using Large Firm IV 2000, rather than Large Firm IV 1999, because the board structure reforms came into force partly in 2000 and partly in 2001.

investment efficiency would decline with size both below and above 2 trillion won; jump at the point where governance rules kick in, *for reasons other than governance*; and do so beginning in mid-1999 when the governance rules are adopted.

It is a close question whether one should understand large firm IV as instrumenting for Board Structure Subindex, or for all of *KCGI*. As Table 2, Panel B shows, Large Firm *IV 2000* correlates most strongly with Board Structure, but also correlates with Disclosure, Board Procedure, and Shareholder Rights. The 1999 reforms directly affect Board Structure, but a change in board structure could cause firms to change governance in other areas, perhaps with a lag. We return to this issue below.

Some caveats for our IV analysis. The effect of the reforms might differ for small and mid-sized firms which voluntarily adopt similar reforms.[7] Second, if we instrument only for Board Structure, but the reforms also cause large firms to change their governance in other ways, the coefficient on Instrumented Board Structure in a two stage least squares (*2SLS*) analysis will partly capture the indirect effect of the reforms on other aspects of governance, which in turn predict Tobin's *q*. Third, we have no available instrument for the other subindices.

While share prices should change in 1999 when the reforms are adopted, we expect firm behavior to change only after the rules take effect. Thus, in regressions with performance measures, such as dividends or profitability, as the dependent variable, we use Large Firm *IV 2000* to instrument for Board Structure Subindex.

## 4. Linking Corporate Governance to Firm Market Value

### 4.1. *KCGI* and Board Structure Subindex Over Time

Figure 2 shows histograms of *KCGI* at year-end 1998 and 2004. One can readily see the substantial change in governance between these two dates. This large time-variation in governance makes it feasible to obtain results from firm fixed effects regressions. In Figure 2,

[7] Black and Kim (2011) find that board structure reforms predict similar changes in Tobin's *q* for large and mid-sized firms. Thus, the treatment effect on mid-sized firms may be similar to its effect on the treated.

the left set of charts show the time-trend in the mean values of *KCGI* and its subindices, separately for large, mid-sized, and small firms. *KCGI* increases for all three groups, but the increase is greater for large firms (see also the summary statistics in Table 2), moderate for mid-sized firms, and limited for small firms. The right set of charts provides an expanded view of the changes in Board Structure Subindex. Board Structure Subindex jumps for large firms in 2000 and 2001, as the 1999 rules take effect. It rises, later and less sharply, for mid-sized firms, starting around 2001, and barely budges for small firms.

### 4.2. Association between Corporate Governance and Market Value

We begin our analysis by confirming, in a multiyear context with panel data, one of the main findings of BJK: There is a strong positive relationship between *KCGI* and firm market value, proxied by *ln*(Tobin's *q*). Table 4 includes the full set of control variables we use throughout this paper, most controls are suppressed in later tables. Regression (1-3) show results for *KCGI* with, respectively, pooled OLS, firm random effects, and firm fixed effects specifications. The coefficient on *KCGI* is similar (0.0064 for OLS; 0.0045 for random effects; 0.0035 for fixed effects), and is highly statistically significant in all specifications.[8]

We use *ln*(Tobin's *q*) as our principal measure of firm value. Taking logs reduces the influence of high-*q* outliers. In this and later regressions, we identify and drop outliers for each year if a studentized residual from a regression of the dependent variable (here *ln*(Tobin's q)) on the principal independent variable (here *KCGI*) is greater than ± 1.96.[9]

Except as otherwise specified, we report the contemporaneous relationship between the dependent variable and governance. With fixed effects, this means examining the

[8] We run fixed effects regressions with an unbalanced panel of firms. Results with a balanced panel (not reported) are similar; the coefficient on *KCGI* is similar, and the *t*-statistic is somewhat lower, likely due to smaller sample size. In unreported regressions, we obtain similar results with fewer or no control variables.

[9] In unreported robustness checks, we obtain similar results if we do not take logs, retain outliers, or winsorize outliers instead of excluding them. We also find a strong association between *KCGI* and two alternate measures of firm value: (market value of equity)/(book value of equity); and (market value of equity)/sales. Almeida, Park, Subramanyam and Wolfenzon (2011) assess potential measurement error in Tobin's *q* for Korean chaebol firms due to their cross-ownership of other firms and conclude that a simple measure of *q*, similar to the one we use here, works reasonably well.

contemporaneous relationship between change in the dependent variable and change in governance. Our *IV* results involve a partial lag, since we set Large Firm *IV 2000* =1 for large firms beginning in 2000, while the 1999 reforms are effective partly in 2000 and partly in 2001. In unreported robustness checks, we find similar results, sometimes stronger, sometimes weaker, if we lag governance by a year to allow for a lagged effect on performance.

In the fixed effects regression (3), the 0.0035 coefficient on *KCGI* is both statistically highly significant ($t$ = 4.94) and economically meaningful. It implies that a worst-to-best change in *KCGI* (roughly 80 points) predicts a 0.28 increase in *ln*(Tobin's *q*) (using the sample median of 0.80 for Tobin's *q*) and a 96% increase in share price (using the sample median of 0.53 for debt/assets).

In regressions (4) and (5), we replace *KCGI* with all five subindices included separately. Regression (4) uses random effects; regression (5) uses fixed effects. Board Structure is the most important driver of the overall results for *KCGI*. The 0.0099 coefficient on Board Structure Index in Regression (5) implies that a worst-to-best change in the Board Structure Index (roughly 20 points) predicts a 0.20 increase in *ln*(Tobin's *q*) and a 65% increase in share price (using the sample medians for Tobin's *q* and debt/assets). Disclosure Subindex is also significant, and Ownership Parity Subindex is significant with random effects. The Board Procedure and Shareholder Rights subindices are not significant. Comparing fixed to random effects, the coefficients are similar for all subindices except Ownership Parity, which suggests that we do not introduce large bias for these subindices by using random effects instead of fixed effects. In regression (4), the λ coefficient, which measures the relative weight of within and between estimates (Wooldridge, 2008, § 14.2), gives 0.70 weight on the within estimate, so random effects are closer to fixed effects than to OLS.

Below, we rely principally on firm fixed effects. However, Ownership Parity Subindex has limited time variation. Thus, fixed effects will suppress its role in governance. This could explain the larger coefficient on KCGI in pooled OLS, compared to fixed effects. In a pooled OLS regression with year dummies (otherwise similar to regressions (4-5)), Ownership Parity

strongly predicts Tobin's *q*. To capture the effect of Ownership Parity, we also rely below in part on firm random effects.

The random effects specification is a compromise. Pooled *OLS* regressions fully capture the role of Ownership Parity but will produce biased coefficients if there are important unobserved time-invariant firm effects. Fixed effects will correct this source of bias, but will suppress the effect of Ownership Parity, and may therefore also lead to a downward biased estimate of the overall effect of *KCGI*. The random effects specification reduces the potential bias in *OLS*, especially with a large lambda value, while letting us partly capture the effect of "between firms" variation in Ownership Parity, but will still produce biased coefficients if the firm effects are correlated with omitted time-varying variables. Compare Zhou's (2001) criticism of fixed effects to assess the effect of managerial share ownership on performance. A Hausman test rejects the null of equal fixed and random effects coefficients, but this does not tell us which is preferable, only that they are different.

The fixed and random effects results in Table 4 are consistent with the prior research on emerging markets discussed in Section 2.1, but are nonetheless an important extension of that research. With one exception, the Black, Love, and Rachinsky (2006) study of Russia, prior work relies only on cross-sectional results, and thus may not be reliable.

### 4.3. Instrumental Variable Results

We also use Large Firm *IV 1999* to instrument for Board Structure Index, in a firm fixed effects, two stage least squares (*2SLS*) framework. Regression (6) is the first stage. Large Firm *IV 1999* is a strong predictor of Board Structure Subindex, as expected. Regression (7) is the second-stage. Board Structure Subindex remains a strong predictor of Tobin's *q*, with a higher coefficient than in Regression (5). Disclosure subindex weakens slightly, but remains marginally significant. The board structure results are consistent with Black and Kim (2011).

## 5. Does Board Structure Reform Predict Other Governance Changes?

An initial question, in understanding the channels through which governance affects firm market value, is whether and how governance changes *causally predict* other governance changes. Correlation is easy to measure, but tells us nothing about causation; instead the same firm-specific factors that lead to some governance choices likely lead to others as well. Here, we use the 1999 legal shock to board structure to assess whether board structure changes causally predict changes in the rest of *KCGI*.

We use a difference-in-differences (*DiD*) approach, specified in equation (1), with large firms (assets > 2 trillion won, n = 39) as the treatment group, mid-sized firms (assets from 0.5 to 2 trillion won, n = xx) as the control group, and robust standard errors. We exclude small firms (assets < 0.5 trillion won). We measure size at year-end 1999, just after the legal reforms.[10]

$$(S_{i,\tau} - S_{i,1999}) = \alpha_\tau + \lambda_\tau * L_{i,1999} + \varepsilon_{\tau,i} \qquad \textbf{(1)}$$

Here $\tau$ is the year from 1998 to 2004 (other than the base year of 1999), $S_{i,\tau}$ is the value of a *KCGI* Subindex (or element) at time $\tau$, and $L_{i,1999}$ is a large-firm dummy variable (=1 if firm *i* is large at year end 1999, 0 otherwise). For each year $\tau$, the constant $\alpha_\tau$ gives the predicted change in Subindex *S* for mid-sized firms from year 1999 to $\tau$. The coefficient of interest is $\lambda_\tau$, which gives the predicted additional change in Subindex *S* over this period for large firms.

For each date $\tau$, the constant $\alpha_\tau$ gives the predicted change in *ln*(Tobin's *q*) for mid-sized firms from time 0 to time $\tau$. The coefficient of interest is $\lambda_\tau$, which gives the predicted *additional* change in $S_i$ for large firms. If the board structure reforms caused large firms to make other governance changes, these coefficients should be positive after 1999, but insignificant in 1998.

Figure 3 reports our principal results for those subindices and elements for which the board structure reforms predict other changes. It shows the change in the subindex or element

[10] We exclude from the treatment group banks and one early adopter firm that had 50% outside directors at May 1999. In robustness checks, we obtain similar results if we drop mid-sized firms from the control group when they voluntarily adopt 50% outside directors.

coefficient for large firms by period (solid line), together with 90% confidence bounds (dotted lines). The principal follow-on changes in corporate governance are for: (i) Disclosure Subindex, driven by the elements for investor relations activity and English language disclosure; (ii) a system for evaluating outside directors; and (iii) more than 50% outside directors.

In addition, when they adopt audit committees, firms also often adopt several related procedures, included in Board Procedure Subindex: audit committee consists entirely of outside directors (roughly 60% adoption); audit committee includes an accounting expert (roughly 1/3 adoption); and audit committee meets at least 4 times per year (roughly 1/3 adoption). These percentages are similar for large firms, which must have an audit committee, and for mid-sized firms which create the committee voluntarily. The 1999 legal changes do not predict significant changes in Shareholder Rights Subindex or its elements; in Ownership Parity, nor (aside from the changes noted above) Board Procedure Subindex.

## 6. Self-Dealing Channels

We turn in this Section to evidence on channels through which governance may affect insider self-dealing, and thus firm market value, potentially without affecting overall firm value. We focus our attention on *KCGI* and on the subindices -- Board Structure, Ownership Parity, and Disclosure -- that predict higher market value. We treat Board Procedure and Shareholder Right subindices, which do not predict firm market value, as control variables.

Related party transactions (RPTs), which benefit insiders but extract value from the firm, are a major risk facing outside investors in many countries, including Korea. For Korea, there is evidence that extraordinary RPTs are adverse to minority shareholders. See Bae, Kang, and Kim (2002) (mergers with related parties); Baek, Kang, and Lee (2006) (equity offerings to insiders); compare Cheung, Rao, and Stouraitis (2006, Hong Kong). These studies provide evidence of "equity tunneling" (using the tunneling terminology of Atanasov, Black, and Ciccotello 2011), in which insiders self-deal in order to increase their fractional ownership of the

firm, rather than to extract some of its cash flow, but do not address whether governance mediates the adverse impact of these major transactions.

Here we examine cash flow tunneling. We study whether "ordinary" RPTs – sales to and purchases from affiliated companies predict lower firm value. There is a perception in Korea that RPTs, especially purchase of goods and services by public firms from private suppliers owned by the public firm's controllers, is an important problem.[11] See also Joh (2003) (low profitability of public firms in Korean *chaebol* groups). We then ask whether better governance either (i) leads to reduced *levels* of ordinary RPTs, or (ii) moderates the effect of these transactions on firm value. We also assess whether the firms where we find evidence that governance affects cash flow tunneling are the ones where one would expect to find an effect.

Ordinary RPTs can be seen as similar to partial vertical integration. They can reduce efficiency, if the firm would do better to transact with an unrelated party, but can increase efficiency by reducing transaction costs and the risk of opportunism. If firms engage in RPTs principally when it is efficient to do so, governance might have little impact on RPT volume.

The implications of RPTs for minority shareholders are distinct from their implications for overall firm efficiency. A transaction might be efficient, but nonetheless be priced to benefit the controllers at the expense of minority shareholders. The controllers' incentives to engage in mispriced RPTs depend on their relative ownership of the transacting firms. If the controllers own a larger (smaller) percentage of Firm B than of Firm A, we might expect transactions between the firms to benefit B (A) at A's (B's) expense.

### 6.1. Available Data on Related-Party Transactions

Korean public firms are required to disclose in their annual financial statements amounts owed to the firm by affiliated firms (including receivables), debts owed to affiliated firms (including payables), purchases (sales) of goods and services from (to) affiliates, and purchases (sales) of assets from (to) all affiliates together. We have data on RPT volume with each

[11] **[*news stories to come from Woochan]**

counterparty, but data on the controller's ownership of the counterparty only if the counterparty is itself public, and no data on pricing. Thus, for our full sample, we cannot assess which RPTs are with other firms in which the insiders own a larger (smaller) percentage stake, and thus are likely to be adverse to firm value.[12]

We have more complete information for firms which are part of major *chaebol* groups. The KFTC requires these firms to disclose the identities of counterparties to all RPTs, transaction volume with each, and the controlling family's ownership of both private and public counterparties. We still lack data on transaction pricing. We use this additional information to construct an "Expropriation Risk Index (ERI)," which captures the extent to which the firm transacts with related parties in which the controlling family or group owns a larger percentage of cash flow rights than it owns in the subject firm. For each firm *i*, related counterparty *j*, and year *t*, we compute a cash flow rights differential as:

(Cash Flow Differential)$_{ijt}$ = controlling family′s fractional cash flow rights in counterparty – its cash flow rights in the firm concerned).

If the counterparty is an individual family member, we assume controller's cash flow rights = 1. We then define an Expropriation Risk Index, which captures the idea that RPTs will tend to move value to firms in which the controller has higher cash flow rights:

$$\text{ERI}_{it} = \sum_{j \neq i} \left( \frac{RPTs}{Sales} \right)_{ijt} \times \left( \text{Cash Flow Differential} \right)_{ijt}$$

If this index is positive, the controllers have incentives to use RPTs to extract value from the firm.

[12] Preventing or reducing the value impact of large-scale RPTs, such as the mergers studied by Bae, Kang, and Kim (2002) or the equity issuances studied by Baek, Kang and Lee (2006), could be an important channel through which governance affects market value, but it is a channel we cannot measure because these transactions are too infrequent. Bae, Kang and Kim found 107 related-party mergers over 17 years (6 per year). Baek, Kang and Lee found 60 equity offerings over 12 years (5 per year). They found a larger number of offerings of convertible bonds or bonds with warrants, but Korean legal reforms in 1997 limit the number and dilutive effect of these offerings during our sample period.

### 6.2. Full Sample Results for RPT Volume

We first consider, in Table 5, full-sample results, for volume of purchases from related parties, sales to related parties, and their sum (denoted "RPTs"), scaled by sales. Table 5 uses firm fixed effects and the same array of control variables as Table 4, including profitability. We winsorize RPTs/sales at 99% to reduce the impact of high outliers. In unreported regressions, we obtain similar results for related party sales and purchases considered separately, and if we exclude small firms from the sample, and do not find a significant relation between RPTs and profitability.

In regression (1), we find a negative, statistically significant coefficient on RPTs/sales, indicating that investors assign lower value to firms with high *RPTs*. Compare Dahya, Dimitrov and McConnell (2007), who find a marginally significant negative coefficient on an existence-of-RPTs dummy variable in predicting Tobin's *q*. However, the economic magnitude is small. For a firm which is at the sample mean of RPTs/sales = 0.10, the -0.069 coefficient implies only an 0.007 reduction in Tobin's *q*. In regression (2), we add KCGI as an independent variable. KCGI is positive, as expected from Table 4, but there is little change in the negative coefficient on RPTs/sales.

Regression (3) shows our first main cash-flow tunneling result. The coefficient on an interaction between *KCGI* and RPTs/total sales is positive and significant. Thus, the negative relationship between RPTs/sales and Tobin's *q* is weaker for firms with higher *KCGI*. The -0.201 coefficient on RPTs/sales and the +0.0035 coefficient on its interaction with *KCGI* imply that the predicted effect of RPTs/sales is neutral for firms with *KCGI* of 57 (=0.201/0.0035) or more. This is below the mean large-firm *KCGI* score beginning in 2002. Thus, investors treat the KCGI levels achieved by many large firms as offsetting the otherwise negative effect of RPTs on market value.

In Regression (4), we focus on Board Structure Subindex and its interaction with Related Party Transactions, while controlling separately for other subindices and their interactions. The interaction between Related Party Transactions and Board Structure Subindex is positive, but not

significant. The interaction terms are also insignificant for other subindices. The positive coefficient on the interaction with *KCGI* in regression (2) appears to reflect a combination of positive coefficients on the interaction terms for Board Structure, Disclosure, and Board Procedure.

In Regression (5), we switch to *2SLS* and use Large Firm *IV 1999* to instrument for Board Structure Subindex. In this and later tables, we report only the second stage of *2SLS*; the table heading gives the first-stage coefficient on the instrument. In this and later regressions where we instrument for Board Structure Subindex and examine interaction effects, we implement our overall regression discontinuity design by controlling for both *ln*(assets) and the interaction between *ln*(assets) and the relevant variable (here Related Party Transactions). In regression (5), the interaction between Related Party Transactions and instrumented Board Structure Subindex is positive and significant.

The stronger results for instrumented Board Structure Subindex are consistent with the 1999 reforms leading to improved RPT pricing, but not through board structure alone. Instead, the new board structure leads to improved disclosure (as we saw in Figure 2), and perhaps to other governance changes, which have an overall effect on RPTs. Alternatively, since our *IV* results tell us only the predicted treatment effect on the treated (large firms), there could be differences between large and small firms in how board structure affects RPTs.

In unreported regressions, we find that higher *KCGI* does not predict either fewer related party purchases and sales, or a lower likelihood of reporting non-zero RPTs.[13] This non-result is sensible if most routine RPTs involving purchase and sale of goods and services are efficient for the firm, even if some are priced to benefit insiders (or investors so fear). Better governance may improve pricing (an RPT pricing channel) while still permitting efficient transactions between related firms. The RPT pricing channel implies lower private benefits for insiders, but not necessarily higher overall firm value.

[13] Compare the cross-country study by Dahya, Dimitrov and McConnell (2007), who find a barely significant negative coefficient on proportion of independent directors in predicting an existence-of-RPTs dummy variable.

### 6.3. Which RPTs Affect Value: Evidence from *Chaebol* Firms

We next limit the sample to *chaebol* firms, for which we can compute the Expropriation Risk Index (ERI). One cost of this limit is a sharp drop in number of observations, from 3165 to 428, which reduces statistical power. In Table 6, regressions (1)-(3) are similar to Table 5, regressions (1)-(3). In regressions (1) and (2), RPTs/sales take a negative coefficient, similar to Table 5, but is economically small and statistically insignificant. Some of the loss in significance reflects the smaller sample. In regression (3), we add an interaction between KCGI and RPTs/sales. The coefficient is positive and similar in magnitude to the full sample coefficient from Table 5, but insignificant, due to the much smaller sample size. In regression (4), we limit the sample to firms with mean ERI > 0. For these firms, the coefficient on RPTs/sales jumps in magnitude from -0.230 for all firms to -0.557 and is strongly statistically significant despite the further drop in sample size to 221 observations. However, the negative relationship between RPTs and Tobin's q is moderated by KCGI, as indicated by the strong positive coefficient on the interaction between KCGI and RPTs/sales. The two coefficients taken together imply that RPTs have a neutral effect on firm value at KCGI = 59. In contrast, regression (6) reports results for chaebol firms with mean ERI < 0, for which controllers do not have incentives to use RPTs to extract value. The coefficients on RPTs/sales and KCGI * (RPTs/sales) change sign and are statistically insignificant.

Taken together, regressions (4) and (6) provide strong evidence that investors – at least where they have the data to do so – assess the impact of RPTs on firm market value taking into account the counterparties to the RPTs, which determine whether the firm is likely to face adverse transfer pricing in these transactions. For firms at risk of tunneling through RPTs, and *only* those firms, investors also appear to expect better governance – more specifically, stronger board structure -- to mitigate transfer pricing risk. This is our first main set of tunneling results. We have evidence for a channel which (i) links governance to reduced tunneling; (ii) does so though the subindex that drives the positive relationship between governance and Tobin's *q*; and (iii) does so for firms with mean ERI > 0, which are likely to face adverse RPT pricing.

As regression (5) indicates, the result for firms at risk of adverse transfer pricing is driven by the 14 large *chaebol* that are in the KFTC list of major *chaebol* groups in each year in our sample period (plus four smaller groups spun off from the original 14). In unreported results, the coefficients on both RPTs/sales and KCGI * (RPTs/sales) are insignificant for the other chaebol with positive Expropriate Risk Index (albeit with a sample of only 16 small firms).

Bertrand et al. (2002) find evidence that tunneling occurs in Indian firms through non-operating cash flows and no evidence that tunneling affects operating profits. In contrast, we find evidence that controllers engage in cash-flow tunneling through routine RPTs; these transactions will affect operating profits. To our knowledge, prior research has not provided evidence that routine RPTs are an important vehicle for cash-flow tunneling.

### 6.4. Sensitivity of Firm Profitabilityto Industry Profitability

The RPT results in Tables 5 and 6 provide evidence that investors *believe* that governance will moderate tunneling through RPTs, but do not provide direct evidence that governance in fact does so. We consider here another source of evidence, based on the responsiveness of firm profitability to industry profitability. Bertrand, Mehta, and Mullainathan (2002) report evidence consistent with transfer of profits among firms in Indian business groups. Their idea is to measure the responsiveness of *firm* profitability to shocks to *industry* profitability. Low responsiveness suggests that insiders extract more (fewer) potential profits as the firm does better (worse). Bertrand et al. report evidence that firm responsiveness to industry shocks is associated with measures of opportunity to tunnel, such as membership in a business group, and measures of incentives to tunnel, such as insider ownership of the firm′s shares. Siegel and Choudhury (2010) fail to replicate their results for India, but the approach is interesting even if this reanalysis is correct.

We adapt the Bertrand et al. approach to our dataset, and assess whether governance mediates the responsiveness of firm profits to industry shocks. Our RPT results above suggest that (i) RPTs are adverse to value, (ii) governance offsets this adverse effect, and (iii) both of

these results are driven by firms with mean Expropriation Risk Index > 0. We might therefor predict similar results for the sensitivity of firm profitability to industry profitability. More specifically, (i) the sensitivity of firm profitability to industry profitability should rise with governance; and (ii) we should find this effect principally, or more strongly, for firms with mean Expropriation Risk Index > 0.

Table 7 presents our results. In regression (1), we confirm that firm profitability, measured by EBITDA/assets, correlates positively with industry profitability. We again use firm fixed effects, and estimate industry profitability for a particular firm *k* in 4-digit industry *i* as [(EBITDA summed across all other firms in industry *i*)/(assets summed across these firms)]. The coefficient on industry EBITDA/assets is 0.209. In a regression which more precisely tracks the Bertrand et al. specification by using unscaled firm EBITDA (with industry EBITDA defined as industry EBITDA/assets x (firm *k*'s assets)), the coefficient on industry EBITDA is 0.67. The coefficient of less than 1 suggests that firms on average face a combination of tunneling as profits rise, and reduced tunneling or even propping as profits fall.

In Regression (2), we add *KCGI* and its interaction with industry EBITDA/assets. The coefficient on the interaction term is positive and significant. Firm profitability is more responsive to industry shocks for better-governed firms, consistent with governance reducing cash-flow tunneling. The 0.004 coefficient on the interaction term implies that a worst-to-best change in *KCGI* (roughly 80 points) increases the responsiveness of firm profitability to industry profitability by 0.32, which is large relative to the overall 0.21 sensitivity in regression (1).

In Regression (3), we examine which subindices drive this result. We replace *KCGI* and *KCGI**industry profitability with each subindex included separately, plus each subindex interacted with industry profitability. Board Structure Subindex has a positive and significant interaction with industry profitability; the interactions with other subindices are insignificant. The 0.014 coefficient on the interaction term implies that a worst-to-best change in Board Structure (20 points) increases the sensitivity of firm profitability to industry profitability by 0.28.

Thus, the increased sensitivity of better governed firms to industry shocks is driven entirely by Board Structure Subindex.

In Regression (4), we confirm that this result survives when we instrument for Board Structure with Large Firm *IV 2000*. The coefficient on the interaction between instrumented Board Structure Index and industry profitability is again positive and significant. In unreported robustness checks, we obtain similar results in all regressions if we use unscaled EBITDA, unscaled EBIT, or EBIT/assets as dependent variables with corresponding industry measures. We obtain generally stronger results if we drop our extensive control variables and use the minimal controls specification in Bertrand et al. (firm age and *ln*(assets)), and similar results if we limit the sample to large and mid-sized firms.

We next return to the specification in regression (2), and study subsamples partitioned based on Expropriation Risk Index (ERI). The sample for regression (5) includes non-*chaebol* firms (for whom ERI is missing, and firms with mean ERI < 0). The coefficient on the interaction between KCGI and industry profitability drops from 0.0043 in regression (2) to 0.0019 and becomes insignificant. In an unreported regression limited to non-*chaebol* firms, this coefficient remains insignificant and flips sign. In regression (6), we study *chaebol* firms with mean ERI > 0 – the firms for which we found in Table 6 that better governance reduces the negative relationship between Tobin′s q and RPTs. For these firms, the interaction between KCGI and industry profitability is positive and significant.

This is our second main set of tunneling results: We have evidence for a channel which (i) links governance to greater sensitivity of firm profitability to industry profitability (which suggests reduced tunneling and propping); (ii) does so though Board Structure Subindex – the principal subindex that drives the relationship between governance and Tobin's *q*; and (iii) does so principally for firms with ERI > 0, from whom insiders have incentives to tunnel -- the same firms for which governance moderates the negative relationship between RPTs and Tobin's q.

Both sets of tunneling results are consistent with governance reducing wealth transfer from minority shareholders to insiders, but may not imply inefficient firm operation. We lack

the data to directly test whether tunneling moves profits from firms with lower insider ownership to related firms with higher insider ownership.[14]

## 7. Firm Performance Channels

We turn next to evidence on channels which imply a connection between governance and firm performance, and hence overall firm value.

### 7.1. Capital Investments

One likely reason why Korea was hit hard by the East Asian financial crisis in 1997-1998 was overinvestment by Korean firms with insufficient attention to profitability. Shin and Park (1999) find that *chaebol* firms invest more than non-*chaebol* firms during the pre-crisis period, despite poorer growth opportunities. Hong, Lee, and Lee (2007) also find pre-crisis overinvestment by *chaebol* firms, which disappears after the crisis. There is evidence of overinvestment for our sample as well. The mean (median) Tobin's $q$ for our sample are only 0.86 (0.80), which implies that the mean (median) firm is turning a dollar of invested capital into less than dollar of market value. Tobin's $q$ declines with firm size, suggesting that large firms are especially likely to overinvest. And investment is not significantly related to profitability (Table 8, regressions (1)-(2)).

This evidence of overinvestment suggests that one channel through which governance may affect firm value is by reducing overinvestment. This would show up as a lower investment, and likely lower sales growth, for better governed firms. Unlike the tunneling channels discussed above, this channel would imply increased firm value, not just wealth transfers from insiders to outside shareholders.

Table 8 presents results for capital expenditures. We report both firm fixed effects (odd numbered regressions) and random effects results (even-numbered regressions) because

[14] Bae, Kang, and Kim (2002) report that *chaebol* groups use intra-group mergers to benefit controllers at the expense of minority shareholders. Baek, Kang, and Lee (2006) report that insiders in *chaebol* groups benefit from private equity offerings by these firms. We lack a sufficient number of mergers or equity issuances to assess this possibility with our methodology.

Ownership Parity Subindex partially drives our results. We lose the effect of Ownership Parity with fixed effects, due to limited time variation in this subindex. A Hausman test rejects the null of no difference in coefficients between the two approaches, but does not tell us which to prefer. In regressions (1)-(2), we regress capital expenditures (100 * capex/assets); we multiple by 100 to reduce the leading zeros in regression coefficients) on *KCGI*, EBIT/sales (as a measure of profitability), and Tobin's *q* (as a proxy for growth opportunities, controlling for profitability). Other control variables are the same as in Table 4, regression (2), except we omit capex/PPE due to overlap with the dependent variable, and omit share turnover, foreign ownership, and ADR and MSCI dummies, which are relevant in predicting Tobin's *q*, but have no obvious connection to capital expenditures. We find a negative coefficient on *KCGI*, consistent with governance limiting overinvestment. The -0.017 coefficient in regression (2) is economically large and statistically significant, albeit barely so. A worst-to-best change in *KCGI* predicts a 0.013 drop in Capex/assets, which is about half of the sample median of 0.025.

We next assess which subindices of *KCGI* predict changes in investment. We report results for Board Structure and Ownership Parity subindices. Other subindices are insignificant. In Table 8, regressions (3)-(4), we replace *KCGI* with each subindex included separately. Board Structure Subindex has a significant negative coefficient in both regressions. Ownership Parity Subindex also takes a negative coefficient, which is larger and statistically significant with random effects. Thus, two of the three subindices which drive the relationship between *KCGI* and Tobin's *q* in Table 4 also drive the relationship between investment and governance. In regressions (5) and (6), we instrument for Board Structure Subindex with Large Firm *IV 2000*. The results for instrumented Board Structure Subindex are consistent with the non-*IV* results.

### 7.2. Sensitivity of Investment to Profitability and Growth Opportunities

Do better-governed firms invest *better*, not simply less? If so, we might expect that for better-governed firms, investment will be more sensitive to profitability or growth opportunities. We test these possibilities in Table 9. Regressions (1)-(2) include KCGI and its interactions

with EBIT/sales and Tobin's *q*. The positive coefficients on the interaction terms are consistent with better governance predicting greater sensitivity of investment to both profitability and growth opportunities. The interaction with profitability is marginally significant **[*to come r/e joint significance].** In regression (1), the -4.162 coefficient on EBIT/sales and the +0.105 coefficient on its interaction with *KCGI* in Regression (7) imply that investment responds positively to firm profitability when *KCGI* = 42 or higher, which is close to the sample mean for 2002 and later years, and well below the large firm mean.

In regressions (3)-(4), the interactions between Board Structure and Ownership Parity subindices and profitability or Tobin's *q* are positive but only Ownership Parity in the random effects specification is marginally significant. This suggests that the positive interaction between *KCGI* and profitability, in predicting investment, comes from the overall effect of several subindices.

In regressions (5)-(6), we lag KCGI by one year, reasoning that it may take time for governance changes to affect firm behavior. With this change in specification, the interaction term between KCGI and profitability more than doubles in magnitude and becomes statistically strong.

These "sensitivity of investment" results are our second firm performance channel: Better governed firms appear to invest less, but invest better. These channels, taken together, imply that better governance plausibly leads to higher overall firm value, as well as the division of that value between controlling and minority shareholders.

### 7.3. Sales Growth and Sensitivity of Growth to Profitability

Many Korean observers believed that, prior to the East Asian crisis, many firms, especially *chaebol* firms, both overinvested and pursued sales growth at the expense of profitability. These are, of course, related effects. We find above evidence that better governance predicts lower, but more profit-sensitive investment. We examine here whether better governance also predicts slower sales growth, and potentially more profit-sensitive growth.

This too might be value enhancing, if Korean firms otherwise tended to overexpand. Table 10 presents our results. We report only fixed effects results because, unlike the investment results above, we obtain similar results for Ownership Parity Subindex with either fixed or random effects. For interactions, we report only results for profitability; the interactions with Tobin′s *q* are insignificant. Control variables are the same as for the capital expenditure regressions, except we add Capex/PPE and omit 5-year sales growth due to overlap with the dependent variable.

In Table 10, regression (1), we regress one year sales growth (from year *t*-1 to year *t*) on *KCGI* and control variables. *KCGI* takes a significant negative coefficient -- better governed firms grow more slowly. The -0.0023 coefficient on *KCGI* implies that a worst-to-best change in *KCGI* (roughly 80 points) predicts a 0.184 drop in sales growth, which is large relative to the sample median of 0.06. In unreported regressions, we obtain similar results with 3-year sales growth, from *t*-1 through *t*+2, as the dependent variable.

In regression (2), we assess which subindices predict the direct effect of *KCGI* on sales growth. Ownership Parity takes a strong negative coefficient in both regressions; Board Structure is negative but not significant; other subindices are not significant. In regression (3), we instrument for Board Structure Subindex using Large Firm *IV 2000*; the results are similar to regression (2).

In regression (4), we interact *KCGI* with profitability, to assess whether sales growth is more sensitive to profitability for better governed firms, but find no significant effect. In regression (5), we assess whether sales growth is more sensitive to profitability for firms with higher scores on Board Structure and Ownership Parity subindices. The interaction between Board Structure Subindex and EBIT/sales is significant and positive – stronger Board Structure increases the sensitivity of sales growth to profitability. The interaction term is not significant for Ownership Parity.

Table 9 is our third firm performance channel result. *KCGI* as a whole predicts slower growth, as does Ownership Parity Subindex. Sales growth is more sensitive to profitability for

firms with higher Board Structure scores, but not for *KCGI* as a whole. On the whole, the results are weaker than, but consistent with, those for the investment channels. They are consistent with better governance predicting better sales growth decisions, and thus higher firm value for all shareholders taken together.

### 7.4. Dividends and Sensitivity of Dividends to Profitability

La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2000) report evidence that higher *country* levels of investor protection are associated with higher dividends. In Table 11, we investigate whether a similar relationship can be found at the *firm* level. We report results for dividends/sales, but in unreported regressions obtain similar results for dividends/assets.

In an unreported regression of dividends/sales on EBIT/sales and other control variables (dropping EBIT/assets as a control variable), the coefficient on EBIT/sales is positive but insignificant (coeff. = 0.6300, $t$ = 0.95), indicating little if any overall relationship between dividends and profits. In regression (1), higher *KCGI* predicts higher dividends, controlling for profitability with EBIT/sales and EBIT/assets as separate control variables. The 0.0074 coefficient on *KCGI* implies that a worst-to-best change in *KCGI* (roughly 80 points) predicts a 0.006 increase in Dividends/Sales, comparable to the sample median of 0.005.

In Regression (2), we find a strong positive interaction between *KCGI* and EBIT/sales, in predicting dividends/sales. Thus, dividends are more sensitive to profits for better governed firms.

In regressions (3)-(4), we assess which subindices drive these results. In regression (3), we replace *KCGI* with each subindex separately; in regression (4), we add interactions between each subindex and EBIT/sales. Disclosure is the only significant subindex in regression (3); Disclosure and Shareholder Rights have positive interactions with EBIT/sales in regression (4). Other subindices are insignificant.

These results are our fourth firm performance channel: Higher *KCGI* predicts both higher dividends on average, controlling for profits, and greater sensitivity of dividends to profits,

with Disclosure Subindex as the principal subindex that generates these results. Higher, more profit sensitive dividend payouts could increase firm value, not just the value of minority shares, to the extent it results in increased capital market discipline on the managers of more profitable firms.

### 7.5. Board Structure and Lagged Profitability

In unreported regressions, we find no contemporaneous relationship between *KCGI* or subindices and profitability. There is also no lagged relationship for *KCGI* as a whole. However, as Table 12 shows, lagged Board Structure Subindex predicts higher profitability. In regression (1), we regress EBIT/assets for year *t* on Board Structure Subindex for year *t*-2. Board Structure Subindex takes a significant positive coefficient. We obtain similar results in regression (2), using Large Firm *IV 2000* to instrument for Board Structure Subindex.[15] Compare Dahya and McConnell (2007), who report a link in the U.K. between a minimum number of nonexecutive directors and profitability. The effect is economically large: in regression (1) a change in Board Structure Subindex from 0 to 20 predicts a 0.018 increase in EBIT/assets, compared to a sample median of 0.048.[16]

Board Structure Subindex is comprised of two subsubindices, for Board Independence and Board Committees (audit, compensation, and nominating committees). In regression (3), we find that lagged board independence predicts higher profitability; a 0 to 10 change in Board Independence predicts a 0.016 increase in EBIT/assets. In contrast, there is no connection between Board Committee Subsubindex and profitability. This is a sensible result, given the principal functions of these committees.

[15] In unreported regressions, we obtain similar results if we lag Board Structure Subindex by 1 or 3 years, but only marginal significance for instrumented Board Structure Subindex with a 1-year lag.

[16] In regression (2), the 5.4 point increase in instrumented Board Structure Index produced by our large firm IV 1999 instrument (see Table 4) predicts a .007 increase in EBIT/assets.

Table 12 is our fifth firm performance channel, running from lagged board independence to higher profitability (Black and Kim, 2010, find consistent results). However, this channel is limited, and does not appear to exist for *KCGI* as a whole.

## 8. Conclusion

We develop a broad Korean corporate governance index (*KCGI*) index, and extend the cross-sectional results in Black, Jang and Kim (2006), to a multiyear, firm fixed effects framework: Higher *KCGI* predicts higher firm market value. This result is driven principally by Board Structure Subindex and, to a lesser extent, by Ownership Parity and Disclosure subindices. The Board Structure results become stronger in 2SLS, where we use the 1999 legal shock to instrument for Board Structure Subindex. This provides evidence that the board structure results are likely to be causal for large firms.

We then investigate the channels through which governance might produce (i) higher firm *market* value without higher overall firm value, through reduced insider self-dealing; or (ii) more efficient operation, and hence an increase in overall firm value. We find evidence of both effects. For firms with higher *KCGI*: (i) related party transactions are less adverse to firm value; (ii) firm profitability is more sensitive to shocks to industry profitability, suggesting reduced tunneling by insiders; (iii) capital expenditures are lower (against background evidence that many Korean firms overinvest), but investment is more sensitive to profitability; (iv) dividends are higher, controlling for profits, and are more sensitive to profits; and (v) lagged board structure (but not *KCGI* as a whole) predicts higher profitability. The first two channels are consistent with governance producing reduced insider tunneling of profits; the remainder are consistent with governance leading to improved performance and thus higher overall firm value.

Board Structure Subindex is associated with all except the dividends channel. Ownership Parity is associated with the investment channel. Recall from Table 4 that Board Structure Subindex is the subindex that is strongly associated with firm market value in a fixed effects specification; Ownership Parity is also associated with firm market value in a random

effects specification. Thus, there is a strong overlap between the subindices which predict Tobin's *q* and those which predict these channels. This is consistent with these channels helping to explain the relationship between governance and firm market value.

Our nonresults for the Board Procedure and Shareholder Rights subindices are consistent with skeptical views about the value of commercial corporate governance indices (e.g., Bhagat, Bolton, and Romano, 2008; Daines, Gow, and Larcker, 2010). These indices heavily weight procedural aspects of governance, which are easy to count but may not matter much.

If Korea's 1999 reforms increased total firm value, they imply that firms were out of equilibrium prior to the reforms, and raise the question of why firms did not adopted these reforms voluntarily. There are several possibilities. One is that the reforms were not on balance beneficial for controllers, who would benefit from higher firm value, but lose from reduced opportunity for self-dealing. A second is that large firm controllers did not expect the value gains which in fact occurred. A third is that broad reforms, across all large firms, changed market perceptions of Korean governance, in a way that individual firm-level efforts might not have (compare the governance reform in India promoted by large Indian firms, see Black and Khanna, 2007). The first two possibilities are consistent with the opposition to the reforms by the Federation of Korean Industry, the principal trade group for the major *chaebol* groups. The second and third possibilities are consistent with post-1999 voluntary reforms by small firms, and the tendency for some large firms to go beyond the legal minimums in various respects.

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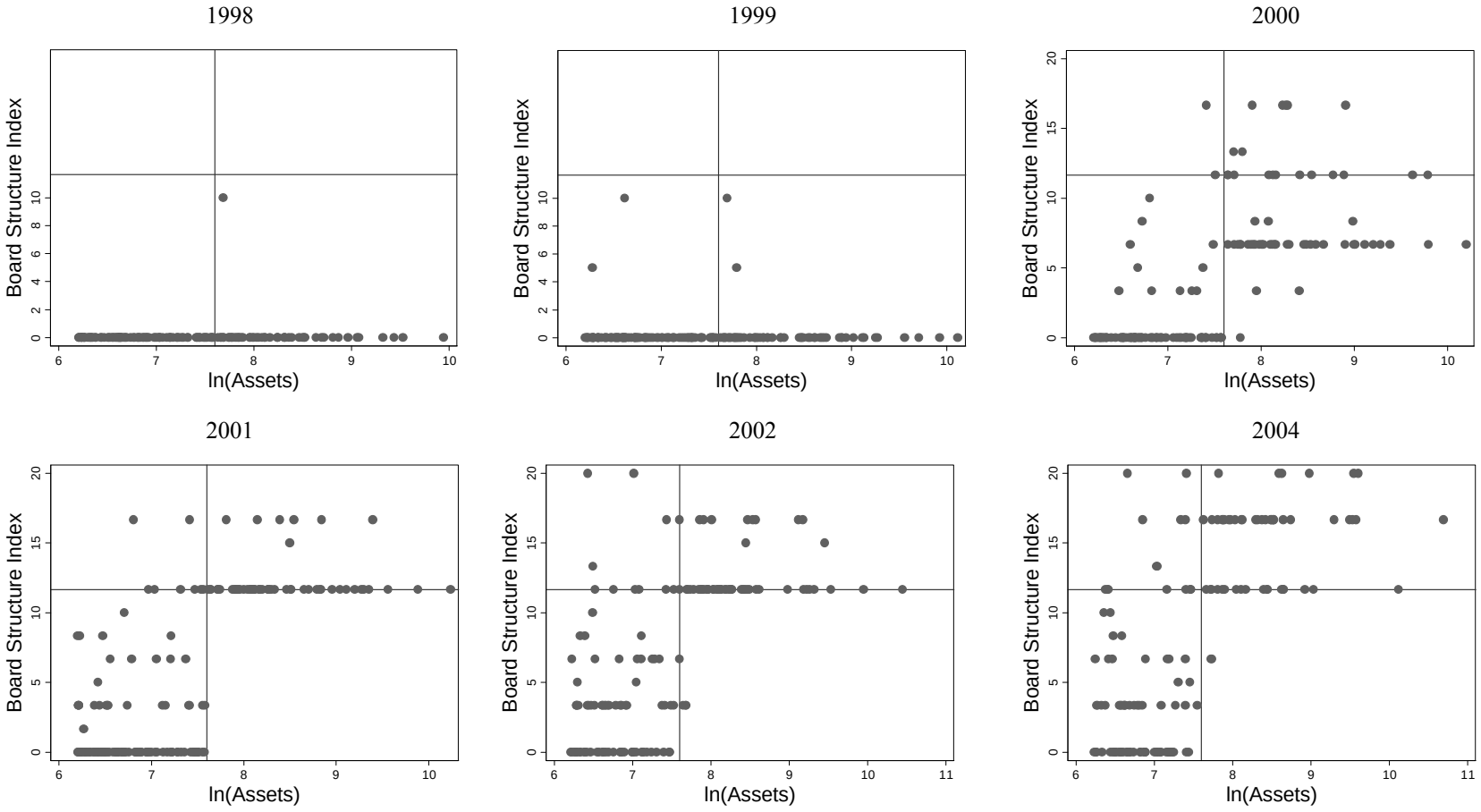
## Figure 1: Board Structure Index and Asset Size

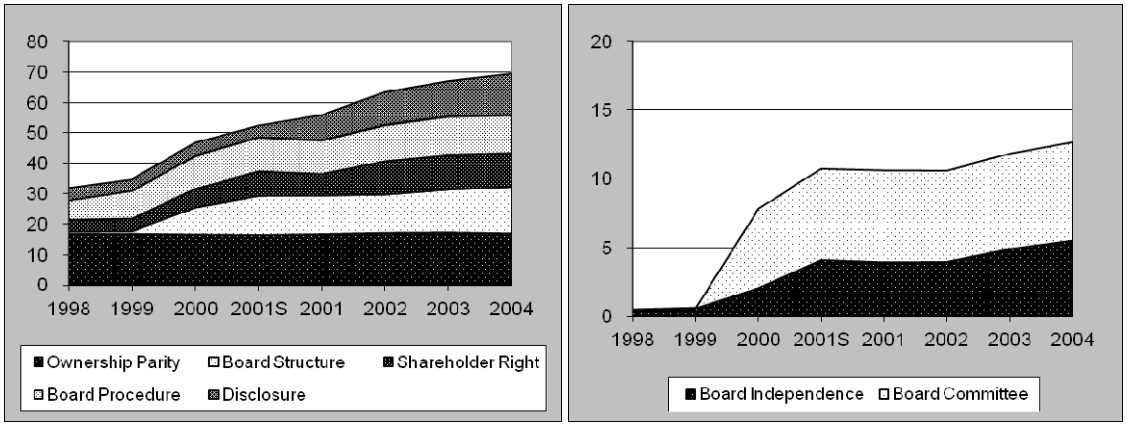
The scatter plots show the relationship between *ln*(assets in billion won) and Board Structure Index (0~20) from 1999–2004. The 1999 reforms require large firms (assets > 2 trillion won; ln(assets = 7.60) to have a minimum Board Structure Index value ≥ 11.7 (5 points for 50% outside directors; 6.7 points for audit and outside director nomination committees). Audit committee is required in 2000; 50% outside directors and outside director nominating committee in 2001. Sample excludes banks and SOEs. Vertical line indicates 2 trillion won; horizontal line indicates minimum Index value for large firms. Firm size is measured separately for each year.



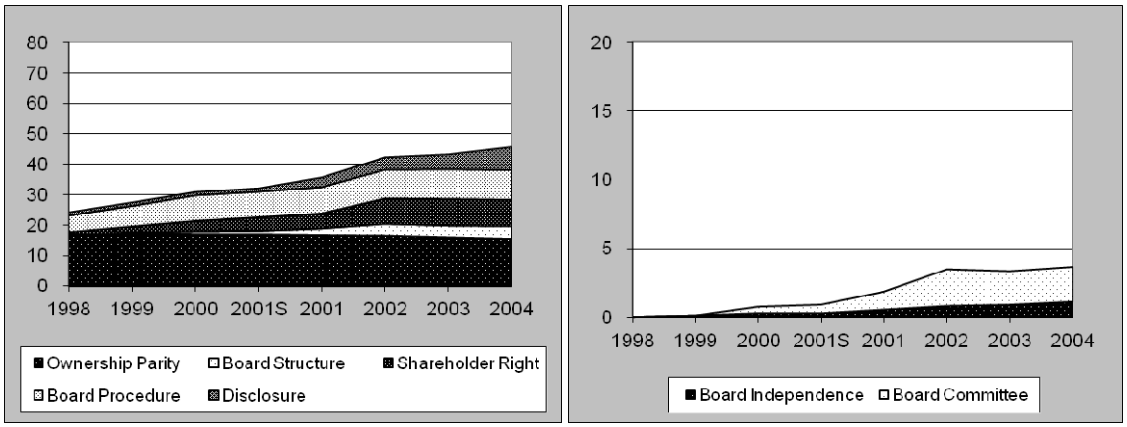
## Figure 2: Change in *KCGI* and its Subindices over Time

The left set of charts show mean values of *KCGI* and each component index from 1998 to 2004, separately for large firms (assets > 2 trillion won), mid-sized firms (0.5 trillion won < assets ≤ 2 trillion won), and small firms (assets ≤ 0.5 trillion won) firms. The right set of charts provide an expanded view of the Board Independence and Board Committee sub-subindices, which together comprise Board Structure Subindex. Sample excludes banks.

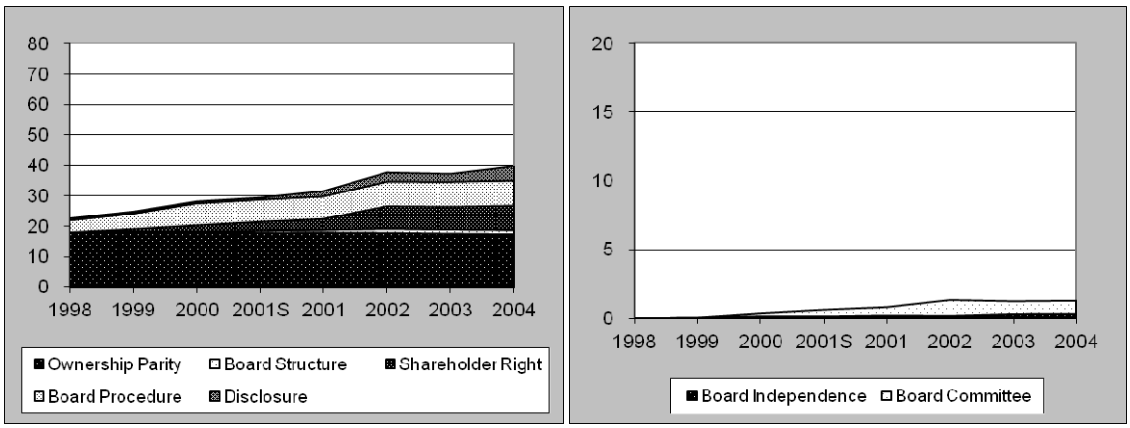
**Large Firms (assets > 2 trillion won)**




**Mid-sized Firms (assets from 0.5-2 trillion won)**

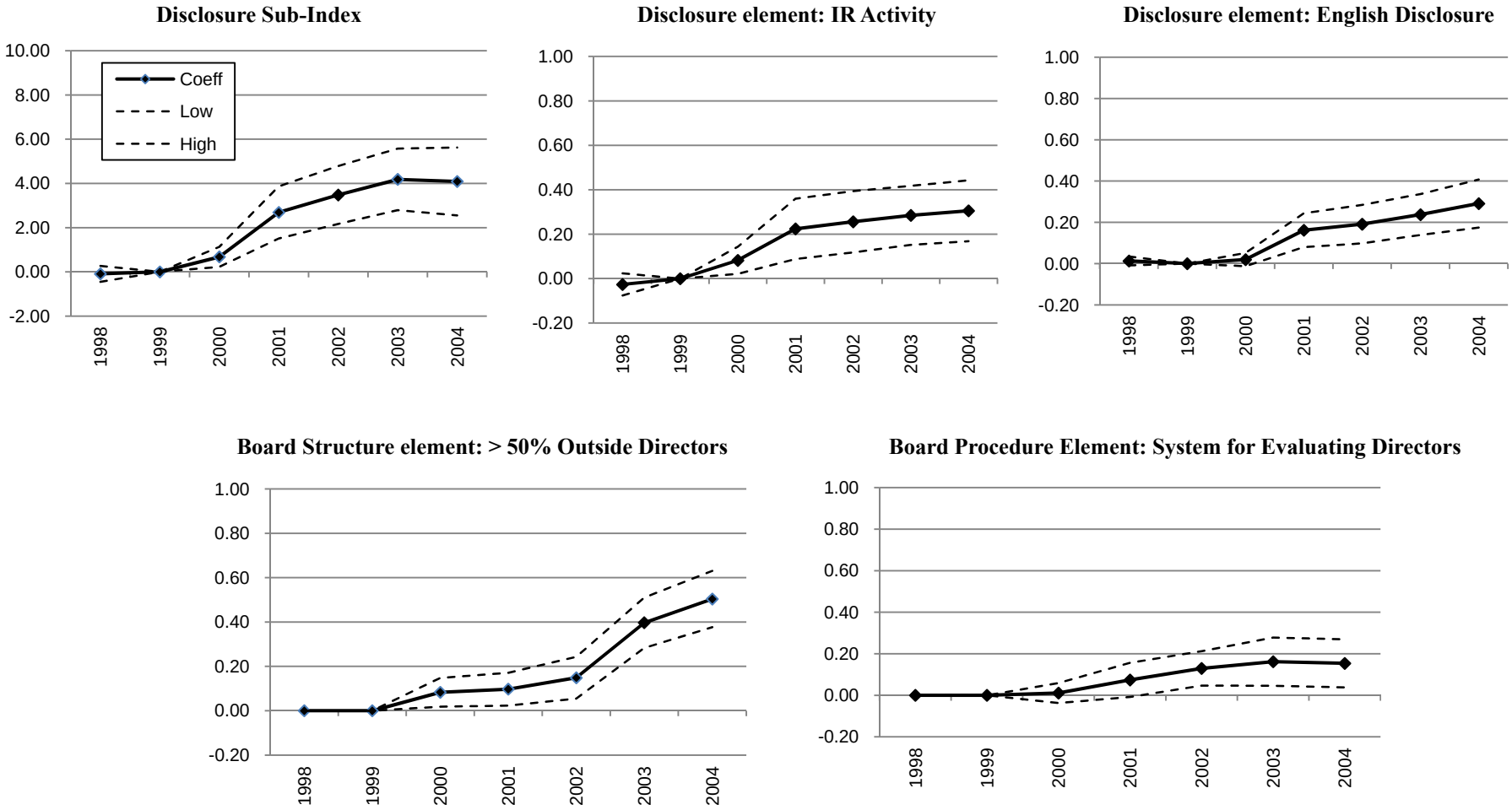



**Small Firms (assets ≤ 0.5 trillion won)**



## Figure 3: *DiD* Results for Selected *KCGI* Subindices and Elements

Difference-in-differences for selected *KCGI* Subindices and elements. Solid line shows coefficients on large-firm dummy (=1 if assets > 2 trillion won) from annual cross-sectional regressions of change in subindices (elements) from year-end 1999 to indicated year-end on large-firm dummy and constant term, over 1998-2004. Dashed lines show 90% confidence interval around point estimates, using robust standard errors. Treatment group is large firms; control group is mid-sized firms (assets from 0.5–2 trillion won) at year-end 1999. We exclude banks and one early adopter (firm with 50% outside directors at year-end 1999).



## Table 1: Construction of *KCGI*, 1998-2004

This table shows (i) the governance elements used to construct *KCGI*. (ii) data sources; and (iii) the rules we use to fill in missing information. Element labels are consistent with Black, Jang, and Kim (2006) (shown in mid-2001 Regression). Data sources are: director database, ownership database, annual surveys by the Korea Corporate Governance Service (KCGS) beginning spring 2001, and hand-collection. KCGS surveys are in spring of each year and provide end-of-prior-year information, except as shown. We ***extrapolate*** for ***missing elements*** **as** follows: (i) if an element is available in year X, but not in year X+1 (X-1), we extrapolate year X value to year X+1 (X-1). We ***interpolate*** for ***missing firms*** and ***missing elements*** using the following rules applied sequentially: (i) if a firm answers the KCGS survey in years X and X+2, but not year X+1, we use in year X+1 the average of the X and X+2 values; and (ii) if an element is available in years X and X+2, but not year X+1, we use in year X+1 the average of the X and X+2 values. We assume elements are present if they are legally required. *Italics* indicate legally required elements.

For hand-collection, we generally collect values in year X only for firms which had this governance element in year X+1. Thus, for compensation committee, we have KCGS data starting in 2002. We hand collect data for 2001 for firms which had this committee in 2002, collect data for 2000 for firms which had this committee in 2001, etc. For some elements, a change in KCGS methodology led to inconsistency between responses for different years. For these questions, we either replace a 1 value in year X with 0 if the X+1 value is 0, or replace a 0 value in year X with 1 if the X+1 value was 1, as seemed appropriate given the nature of the element. Details on these and other adjustments to the KCGS raw data are available from the authors on request.

| **Date** | **1998-2000** | **mid-2001** | **2001** | **2002** | **2003** | **2004** |
|---|---|---|---|---|---|---|
| **Shareholder Rights Index (A)** | | | | | | |
| Firm permits cumulative voting for election of directors. | hand-collect | A1 | I-3-① | 1-(16) | 1-A-(4) | 1-A-(4) |
| Firm permits voting by mail. | hand-collect | A2 | I-3-② | 1-(17) | 1-A-(5) | 1-A-(5) |
| Firm discloses director candidates to shareholders in advance of shareholder meeting. | hand-collect | A4 | I-9-③ | *required* | *required* | *required* |
| Board approval required for related party transactions (*required 2000 for top 10 chaebol, mid-2001 for all chaebol, 2001 on for large and chaebol firms*) | hand-collect | A5 | II-2-6-① | same as 2001 | same as 2001 | same as 2001 |
| **Board Structure Index (B)** | | | | | | |
| Firm has at least 50% outside directors *(rule adopted 1999 required beginning mid-2001 for large firms )* | director database | *B1* | *I-2-③, II-2-1* | *director database* | *2-A-(1)* | *2-A-(1)* |
| Firm has more than 50% outside directors (director database except as indicated) | director database | B2 | I-2-③, II-2-1 | 1 for large firms if 1 in 2003 or 2-A-(1) ≥ 2 | 2-A-(1) for large firms | 2-A-(1) for large firms |
| Firm has outside director nominating committee (*rule adopted 1999, required from mid-2001 for large firms*). | hand-collect | *B3* | *II-3-4* | *2-B-(12), 2-B-(13)* | *2-A-(9)* | *2-A-(9)* |
| Audit committee of the board of directors exists (*rule adopted 1999, required from mid-2001 for large firm*) | hand-collect | *B4* | *I-6-①* | *4-(1)* | *4-(1)* | *4-(1)* |
| firm has compensation committee | hand-collect | hand-collect | hand-collect | hand-collect | 2-A-(10) | 2-A-(10) |
| **Board Procedure Index (C)** | | | | | | |
| Directors' positions on board meeting agenda items are recorded in board minutes. | hand-collect | C2 | II-2-6-② | 2-B-(4) | 2-B-(21) | same as 2003 |
| Board chairman is an outside director or (from 2003) firm has | 0 firms | C3 (0 firms) | hand collect | hand collect | 2-A-(5) | 2-A-(5) |

| Date | 1998-2000 | mid-2001 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|
| outside director as lead director. | | | | | | |
| A system for evaluating directors exists. | hand-collect | C4 | II-2-6-④ | same as 2001 | 2-B-(39) | 2-B-(34) |
| A bylaw to govern board meetings exists. | hand-collect | C5 | average of mid-2001 and 2003 | 2-B-(18) | 2-B-(16) | same as 2003 |
| Firm holds four or more regular board meetings per year. | hand-collect | C6 | I-4-②, II-2-3-① | 2-B-(1) | 2-B-(19) | 2-B-(20) |
| Firm has one or more foreign outside directors. | hand-collect | C7 | director database | 2-A-(10) | 2-A-(6) | 2-A-(6) |
| Shareholders approve outside directors' aggregate pay (separate from all directors' pay). | hand-collect | C11 | same as mid-2001 | same as 2003 | 2-B-(30) | same as 2003 |
| Outside directors attend at least 70% of meetings, on average | same as mid-2001 [missing if 0 outside directors] | C12 | I-1 | 2-A-(2) | 2-B-34 | 2-B-(30) |
| Board meeting solely for outside directors exists. | hand-collect | C15 | II-3-15-③ | 2-A-(3) | 2-B-(35) | 2-B-(31) |
| 100% outside directors on audit committee | hand-collect | D1 | II-4-1 | 4-(2) | 4-(2) | 4-(2) |
| Bylaws governing audit committee (or internal auditor) exist. | hand-collect | D2 | average of mid-2001 and 2002 | 4-(3) | 4-(3) | 4-(3) |
| Audit committee includes person with expertise in accounting | hand-collect | D3 | II-4-2 | average of 2001 and 2003 | 4-(10) | 4-(11) |
| Audit committee (or internal auditor) approves the appointment of the internal audit head. | hand-collect | D5 | average of mid-2001 and 2002 | 4-(4) | 4-(4) | 4-(5) |
| Audit committee meets ≥ 4 times per year | hand-collect | D10 | I-6-②, II-4-7-① | 4-(7) | 4-(7) | 4-(7) |
| **Disclosure Index (E)** | | | | | | |
| Firm conducted investor relations activity in last year | hand-collect | E1 | II-1-5 | 3-(1) | 3-(1) | 3-A-(1) |
| Firm website includes resumes of board members | same as mid-2001 | E2 | average of mid-2001 and 2002 | 3-(9) | 3-(9) | 3-B-(21) |
| English financial disclosure exists | hand-collect | E3 | average of mid-2001 and 2002 | 3-(15) | 3-(14) | 3-A-(13) |
| **Ownership Parity (P)** | | | | | | |
| Ownership Parity = (1 - ownership disparity); disparity = ownership by all affiliated shareholders - ownership by controlling shareholder and family members | ownership database | P | ownership database | ownership database | ownership database | ownership database |

## Table 2: Summary Statistics for *KCGI* and its Subindices

### Panel A

This table presents number of observations, sample mean, and other statistics for *KCGI,* its subindices, and *IV*, by year, for the unbalanced panel.

| Index | Year | Obs. | Mean | | | Median | Std. Dev. | Min | Max |
|---|---|---|---|---|---|---|---|---|---|
| | | | All | Large | Small | | | | |
| *KCGI* | 1998 | 484 | 24.23 | 33.17 | 23.05 | 23.33 | 6.72 | 10.62 | 64.10 |
| | 2000 | 535 | 31.54 | 49.55 | 28.82 | 29.18 | 10.47 | 7.76 | 84.80 |
| | 2002 | 466 | 43.05 | 66.84 | 38.84 | 39.73 | 13.64 | 14.00 | 97.14 |
| | 2004 | 512 | 44.89 | 72.07 | 40.80 | 42.03 | 13.74 | 20.10 | 98.82 |
| Board Structure | 1998 | 511 | 0.25 | 1.69 | 0.03 | 0.00 | 1.54 | 0.00 | 10.00 |
| | 2004 | 513 | 3.81 | 15.75 | 2.01 | 0.00 | 5.83 | 0.00 | 20.00 |
| Ownership Parity | 1998 | 516 | 17.63 | 17.51 | 17.64 | 18.89 | 2.97 | 3.63 | 20.00 |
| | 2004 | 520 | 17.03 | 17.41 | 16.98 | 18.69 | 3.60 | 4.20 | 20.00 |
| Disclosure | 1998 | 523 | 4.56 | 4.48 | 0.71 | 4.44 | 2.82 | 0.00 | 17.50 |
| | 2004 | 521 | 9.10 | 13.82 | 5.17 | 9.09 | 2.99 | 1.43 | 18.82 |
| Board Procedure | 1998 | 535 | 1.17 | 6.65 | 4.22 | 0.00 | 3.15 | 0.00 | 20.00 |
| | 2004 | 521 | 6.30 | 12.78 | 8.55 | 6.67 | 5.87 | 0.00 | 20.00 |
| Shareholder Rights | 1998 | 516 | 0.82 | 3.74 | 0.36 | 0.00 | 2.89 | 0.00 | 20.00 |
| | 2004 | 521 | 8.65 | 12.03 | 8.14 | 6.67 | 3.23 | 5.00 | 20.00 |

### Panel B

This table presents Pearson correlation coefficients for *KCGI*, its subindices, and *IV*. *, **, and *** indicate significance at 10%, 5%, and 1% levels

| | *KCGI* | Board Structure | Ownership Parity | Disclosure | Board Procedure | Shareholder Rights | Large Firm *IV* 2000 |
|---|---|---|---|---|---|---|---|
| *KCGI* | 1.00 | | | | | | |
| Board Structure | 0.78*** | 1.00 | | | | | |
| Ownership Parity | 0.20*** | 0.01 | 1.00 | | | | |
| Disclosure | 0.74*** | 0.44*** | -0.03** | 1.00 | | | |
| Board Procedure | 0.70*** | 0.50*** | -0.07*** | 0.40*** | 1.00 | | |
| Shareholder Rights | 0.75*** | 0.45*** | -0.02 | 0.43*** | 0.46*** | 1.00 | |
| Large Firm *IV* 2000 | 0.65*** | 0.78*** | -0.01 | 0.43*** | 0.43*** | 0.37*** | 1.00 |

## Table 3: Other Variables

Definition and summary statistics for the principal dependent and independent variables used in this paper. *Panel A* defines each variable and *Panel B* provides summary statistics. Book asset values are in billion won. Book and market values are measured at year end, except that market values for mid-2001 are measured on the last day of June. Firms with missing data for R&D/sales, advertising/sales, exports/sales, or dividends are assumed to have 0 values.

**Panel A: Variable Definitions**

| Variables | Descriptions |
|---|---|
| Tobin's *q* | Estimated as [(book value of debt + preferred stock) + market value of common stock]/[book value of assets]. Book values are measured at year-end. |
| Years Listed | Number of years since original listing on Korea Stock Exchange |
| Leverage | (Book value of debt)/ (Market value of common stock), winsorized at 99% |
| Sales Growth (5 yrs) | Geometric average sales growth rate during the past 5 fiscal years (or available period if less), winsorized at 1%/99%. If fiscal year changes, we keep only years which cover full 12 months |
| Sales Growth (1 yr) | Fractional growth in sales during the past year, winsorized at 1%/99% |
| *R&D*/Sales | Ratio of research and development (*R&D*) expense to sales. |
| Advertising/Sales | Ratio of advertising expense to sales. |
| Exports/Sales | Ratio of export revenue to sales |
| PPE/Sales | Ratio of property, plant, and equipment to sales. |
| Capex/assets | Ratio of capital expenditures to assets |
| Capex/PPE | Ratio of capital expenditures to PPE |
| EBIT/Sales (Assets) | Ratio of earnings before interest and taxes to sales (assets), winsorized at 1%/99%. |
| Market Share | Firm's share of total sales by all firms in the same 4-digit industry listed on KSE. |
| Share Turnover | [Common shares traded during the year / publicly held shares, winsorized at 99%. The denominator is defined as [common shares outstanding x (1 – total affiliated ownership)] |
| Foreign Ownership | [common shares held by foreign investors / common shares outstanding] |
| Sole Ownership | [Number of common shares held by group controlling shareholder and family members / Number of common shares outstanding] |
| RPTs/sales | Sum of sales to and purchases from related-parties divided by total sales; winsorized at 99% |
| Expropriation Risk Index | Defined in the text. Available only for *chaebol* firms. |
| Industry EBITDA/assets | (EBITDA summed across all other firms in the same 4-digit industry)/(assets summed across all other firms in the same 4-digit industry). |
| Dividends/assets | Dividends during the current fiscal year divided by year-end assets. |
| Dividend/Sales | Dividends during current year/same year sales. |
| Large Firm *IV* 1999 (2000) | Large firm IV 1999 (2000) equals 1 firm's book value of assets > 2 trillion won and year is 1999 (2000) or later, 0 otherwise. |
| Top 30 c*haebol* Dummy | 1 if a member of one of the top-30 business groups (based on total group assets) as of April of each year as identified by Korea Fair Trade Commission; 0 otherwise. We treat former state-owned enterprises as non-*chaebol* firms. |
| Level 1 (2/3) ADR Dummy | 1 if firm has level 1 (level 2 or 3) American Depository Receipts (ADRs); 0 otherwise. |
| MSCI Index Dummy | 1 if firm is in Morgan Stanley Capital International Index; 0 otherwise. |
| SOE Dummy | 1 if firm is or was a State Owned Enterprise subject to early adoption of governance reform; 0 otherwise |

**Panel B: Summary Statistics for Selected Variables**

| Variable | No. of Obs. | No. of "1" values | Mean | Median | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|---|---|
| Tobin's *q* | 4125 | - | 0.86 | 0.80 | 0.39 | 0.21 | 6.05 |
| *ln*(Tobin's *q*) | 4125 | - | -0.22 | -0.23 | 0.35 | -1.55 | 1.80 |
| Book value of assets | 4234 | - | 1802.72 | 216.04 | 8322.81 | 2.02 | 184000.00 |
| Years Listed | 4234 | - | 15.34 | 13.00 | 9.61 | 0.00 | 48.00 |
| Leverage | 4231 | - | 5.98 | 2.40 | 11.78 | 0.01 | 102.09 |
| Sales Growth (5 *yrs*) | 4204 | - | 0.10 | 0.08 | 0.18 | -0.30 | 1.30 |
| Sales Growth (1 *yr*) | 4204 | - | 0.09 | 0.06 | 0.31 | -0.62 | 1.69 |
| R&D/Sales | 4259 | - | 0.01 | 0.00 | 0.13 | 0.00 | 7.69 |
| Advertising/Sales | 4259 | - | 0.01 | 0.00 | 0.02 | 0.00 | 0.21 |
| Exports/Sales | 4259 | - | 0.27 | 0.12 | 0.30 | 0.00 | 1.00 |
| PPE/Sales | 4259 | - | 0.51 | 0.39 | 0.77 | 0.00 | 32.21 |
| Capex/assets | 4234 | - | 0.04 | 0.03 | 0.05 | 0.00 | 0.53 |
| Capex/PPE | 4234 | - | 0.14 | 0.09 | 0.20 | 0.00 | 7.73 |
| EBIT/Sales | 4232 | - | 0.05 | 0.06 | 0.12 | -0.63 | 0.36 |
| EBIT/assets | 4234 | - | 0.05 | 0.05 | 0.07 | -0.26 | 0.24 |
| Market Share | 4234 | - | 0.07 | 0.01 | 0.16 | 0.00 | 1.00 |
| Share Turnover | 4248 | - | 7.07 | 4.50 | 8.15 | 0.00 | 44.47 |
| Foreign Ownership | 4142 | - | 8.16 | 1.00 | 14.40 | 0.00 | 94.11 |
| Sole Ownership | 4259 | - | 19.39 | 19.29 | 16.61 | 0.00 | 78.81 |
| RPTs/sales | 3509 | - | 0.10 | 0.02 | 0.17 | 0.00 | 0.87 |
| Expropriation Risk Index | 508 | - | -0.001 | 0.000 | 0.031 | -0.167 | 0.123 |
| Industry EBITDA/assets | 3509 | - | 0.09 | 0.02 | 0.14 | 0.00 | 0.65 |
| Dividends/assets | 3509 | - | 0.19 | 0.08 | 0.25 | 0.00 | 1.11 |
| Dividends/Sales | 4246 | - | 0.05 | 0.06 | 0.05 | -0.31 | 1.00 |
| Large Firm *IV* 1999 | 4234 | 401 | 0.01 | 0.00 | 0.01 | 0.00 | 0.16 |
| Large Firm *IV* 2000 | 4232 | 348 | 0.01 | 0.01 | 0.03 | 0.00 | 0.81 |
| *Top 30 Chaebol* Dummy | 4259 | 823 | 0.11 | 0.00 | 0.32 | 0.00 | 1.00 |
| Level 1 ADR Dummy | 4259 | 116 | 0.10 | 0.00 | 0.30 | 0.00 | 1.00 |
| Level 2/3 ADR Dummy | 4259 | 35 | 0.20 | 0.00 | 0.40 | 0.00 | 1.00 |
| MSCI Index Dummy | 4259 | 462 | 0.03 | 0.00 | 0.17 | 0.00 | 1.00 |
| SOE Dummy | 4259 | 42 | 0.01 | 0.00 | 0.10 | 0.00 | 1.00 |

## Table 4: Corporate Governance and Firm Value

Firm fixed effects and random effects regressions of *ln*(Tobin's *q*) on *KCGI*, its subindices, and other control variables. Sample excludes banks. Regressions (6)-(7) use large firm *IV 1999* (= 1 if firm is large and year is 1999 or later, 0 otherwise) to instrument for Board Structure Subindex. Outliers are identified each year and dropped if the studentized residual from a regression of firm value on *KCGI* is greater than ±1.96. All regressions use unbalanced panels, year fixed effects and firm clusters. Random effects regressions use 4-digit industry fixed effects. $R^2$ is usual $R^2$ for OLS; within $R^2$ for fixed effects; overall $R^2$ for random effects. *t*- or *z*-values are reported in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1% levels. Significant results (at 5% level or better) are shown in **boldface**.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Dependent variable | *ln*(Tobin's *q*) | | | | | Board Structure | *ln*(Tobin's *q*) |
| Stage (for 2*SLS*) | | | | | | 1st stage | 2nd stage |
| Fixed or random effects | OLS | Random | Fixed | Random | Fixed | Fixed | Fixed |
| *KCGI* | **0.0064*** ** | **0.0045*** ** | **0.0035*** ** | | | | |
| | **(8.29)** | **(7.02)** | **(4.94)** | | | | |
| *Board Structure* | | | | **0.0104*** ** | **0.0099*** ** | | |
| | | | | **(7.41)** | **(6.51)** | | |
| *Instrumented Board Structure* | | | | | | | **0.0137*** ** |
| | | | | | | | **(2.91)** |
| *Ownership Parity* | | | | **0.0051** ** | 0.0005 | 0.0377 | 0.0003 |
| | | | | **(2.32)** | (0.19) | (0.88) | (0.12) |
| *Disclosure* | | | | **0.0038*** ** | **0.0032** ** | **0.0586** ** | 0.0029* |
| | | | | **(2.79)** | **(2.12)** | **(2.23)** | (1.85) |
| *Board Procedure* | | | | 0.0019 | 0.0011 | 0.0501 | 0.0008 |
| | | | | (1.00) | (0.48) | (1.39) | (0.36) |
| *Shareholder Rights* | | | | -0.0002 | -0.0009 | 0.0407* | -0.0011 |
| | | | | (-0.15) | (-0.65) | (1.80) | (-0.77) |
| *Large Firm IV 1999* | | | | | | **5.5872*** ** | |
| | | | | | | **(8.24)** | |
| *ln*(assets) | **-0.0242*** ** | **-0.0256*** ** | -0.0423* | **-0.0288*** ** | -0.0440* | -0.1324 | -0.0455* |
| | **(-3.04)** | **(-3.12)** | (-1.77) | **(-3.49)** | (-1.89) | (-0.42) | (-1.91) |
| *ln*(years listed) | **-0.0573*** ** | **-0.0650*** ** | **-0.0989*** ** | **-0.0637*** ** | **-0.0928*** ** | -0.3050 | **-0.0899*** ** |
| | **(-5.83)** | **(-6.62)** | **(-3.14)** | **(-6.44)** | **(-3.00)** | (-0.64) | **(-2.77)** |
| Leverage | **0.0039*** ** | **0.0020*** ** | **0.0016*** ** | **0.0019*** ** | **0.0017*** ** | 0.0053 | **0.0016*** ** |
| | **(7.26)** | **(4.02)** | **(2.84)** | **(3.93)** | **(2.92)** | (0.44) | **(2.90)** |
| Sales Growth | -0.0139 | -0.0212 | 0.0155 | -0.0116 | 0.0284 | **-1.4906** ** | 0.0351 |
| | (-0.38) | (-0.65) | (0.35) | (-0.36) | (0.64) | **(-2.04)** | (0.76) |
| R&D/Sales | **0.0921*** ** | **0.0354*** ** | **0.0256*** ** | **0.0362*** ** | **0.0264*** ** | -0.0993 | **0.0269*** ** |
| | **(3.74)** | **(3.93)** | **(3.81)** | **(4.03)** | **(3.92)** | (-0.97) | **(4.19)** |
| Advertising/Sales | **1.2492*** ** | **0.9451** ** | 0.7756 | **0.9428** ** | 0.7515 | -0.8798 | 0.7589 |
| | **(3.17)** | **(2.35)** | (1.42) | **(2.33)** | (1.38) | (-0.16) | (1.38) |
| Exports/Sales | -0.0055 | -0.0284 | **-0.0892** ** | -0.0297 | **-0.0873** ** | 0.1595 | **-0.0870** ** |
| | (-0.22) | (-1.22) | **(-2.42)** | (-1.28) | **(-2.42)** | (0.37) | **(-2.36)** |
| PPE/Sales | **-0.0516*** ** | **-0.0405** ** | -0.0247 | **-0.0368** ** | -0.0204 | **-0.5461** ** | -0.0179 |
| | **(-3.01)** | **(-2.54)** | (-1.31) | **(-2.32)** | (-1.10) | **(-2.37)** | (-0.93) |
| PPE/Sales$^2$ | **0.0016*** ** | **0.0010** ** | 0.0004 | 0.0008* | 0.0003 | **0.0198** ** | 0.0002 |
| | **(2.92)** | **(1.97)** | (0.67) | (1.73) | (0.45) | **(2.44)** | (0.29) |
| Capex/PPE | **0.1855*** ** | **0.0726*** ** | 0.0453 | **0.0805*** ** | 0.0514* | -0.6294* | 0.0556* |
| | **(4.36)** | **(2.62)** | (1.62) | **(2.89)** | (1.83) | (-1.79) | (1.91) |
| EBIT/Sales | **-0.3455*** ** | **-0.3440*** ** | **-0.2907*** ** | **-0.3579*** ** | **-0.3062*** ** | 3.0424* | **-0.3161*** ** |
| | **(-3.92)** | **(-4.75)** | **(-3.63)** | **(-5.11)** | **(-3.96)** | (1.75) | **(-3.89)** |
| EBIT/Assets | **0.5120*** ** | **0.6079*** ** | **0.5965*** ** | **0.6266*** ** | **0.6104*** ** | -3.5454 | **0.6214*** ** |
| | **(3.03)** | **(4.55)** | **(4.12)** | **(4.81)** | **(4.34)** | (-1.54) | **(4.25)** |
| Market Share | 0.0328 | **0.1278** ** | **0.2029*** ** | **0.1328** ** | **0.1964*** ** | 1.1223 | **0.1905** ** |
| | (0.66) | **(2.39)** | **(2.75)** | **(2.57)** | **(2.79)** | (0.89) | **(2.56)** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Share Turnover | **0.0064*** ** | **0.0041*** ** | **0.0034*** ** | **0.0041*** ** | **0.0034*** ** | 0.0039 | **0.0034*** ** |
| | **(8.83)** | **(7.25)** | **(5.86)** | **(7.15)** | **(5.74)** | (0.57) | **(5.82)** |
| Foreign Ownership | **0.0035*** ** | **0.0027*** ** | **0.0028*** ** | **0.0027*** ** | **0.0027*** ** | 0.0158* | **0.0026*** ** |
| | **(5.22)** | **(4.37)** | **(4.12)** | **(4.35)** | **(4.03)** | (1.76) | **(3.74)** |
| Sole Ownership | **-0.0029** ** | -0.0025* | -0.0015 | -0.0024* | -0.0009 | -0.0263 | -0.0008 |
| | **(-2.35)** | (-1.79) | (-0.84) | (-1.71) | (-0.53) | (-1.24) | (-0.45) |
| Sole Ownership$^2$ | 0.0000 | -0.0000 | -0.0000 | -0.0000 | -0.0000 | 0.0004 | -0.0000 |
| | (0.44) | (-0.03) | (-0.02) | (-0.11) | (-0.19) | (1.32) | (-0.23) |
| Top 30 *Chaebol* Dummy | **0.0420** ** | **0.0358** ** | | **0.0471*** ** | | | |
| | **(2.46)** | **(2.13)** | | **(2.69)** | | | |
| ADR (1) Dummy | -0.0149 | 0.0368 | | -0.0011 | | | |
| | (-0.29) | (0.78) | | (-0.02) | | | |
| ADR (2,3) Dummy | 0.0222 | 0.1285 | | 0.0974 | | | |
| | (0.29) | (1.51) | | (1.16) | | | |
| *MSCI* Index Dummy | **0.0633*** ** | 0.0279 | | 0.0289* | | | |
| | **(2.70)** | (1.53) | | (1.65) | | | |
| SOE Dummy | -0.0470 | -0.0882 | | -0.0892 | | | |
| | (-0.63) | (-1.17) | | (-1.14) | | | |
| Constant | yes | yes | yes | yes | yes | yes | yes |
| 4-digit Industries | yes | yes | no | yes | no | no | no |
| Observations | 3,755 | 3,755 | 3,755 | 3,755 | 3,755 | 3,755 | 3,755 |
| No. of Firms | 665 | 665 | 665 | 665 | 665 | 665 | 665 |
| $R^2$ | 0.3084 | 0.2892 | 0.2301 | 0.2916 | 0.2416 | 0.3428 | 0.2270 |
| λ (weight on within estimator | | 0.7015 | | 0.7043 | | | |

## Table 5: Corporate Governance, Related-Party Transactions, and Firm Value

Firm fixed effects regressions of *ln*(Tobin's q) on *KCGI*, its subindices, RPT/sales ((related-party purchases + sales)/total sales), interaction terms, and control variables. Sample excludes banks. Observations are identified as outliers and excluded if a studentized residual from yearly regressions of the dependent variable on *KCGI* is greater than ±1.96. Other control variables are the same as in Table 4, regression (1). Regression (4) uses large firm *IV* 1999 to instrument for Board Structure Subindex. In the first stage regression, large firm *IV 1999* takes a coefficient of 7.35 ($t$ = 9.43). *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. All regressions use unbalanced panels, year dummies, and firm clusters. $t$-values, based on White's heteroskedasticity-consistent standard errors, are in parentheses. Significant results (at 5% level or better) are shown in **boldface.**

| **Dependent variable: *ln*(Tobin's *q*)** | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **2SLS regression** | no | no | no | no | yes |
| *KCGI* | | **0.0027*** (3.37)** | **0.0018** (2.08)** | | |
| x RPTs/sales | | | **0.0035** (2.32)** | | |
| Board Structure Subindex | | | | **0.0070*** (2.70)** | |
| x RPTs/sales | | | | 0.0047 (0.67) | |
| Instrumented Board Structure Subindex | | | | | **0.0098** (2.01)** |
| x RPTs/sales | | | | | **0.0214** (2.18)** |
| RPTs/sales | **-0.0691** (-2.37)** | **-0.0669** (-2.26)** | **-0.2012*** (-3.24)** | -0.1825 (-1.46) | 0.0007 (0.00) |
| x *ln*(assets) | | | | | -0.0176 (-0.78) |
| Ownership Parity Subindex | N | N | N | Y | Y |
| Ownership Parity x RPTs/sales | N | N | N | Y | Y |
| Other subindices of *KCGI* | N | N | N | Y | Y |
| Other subindices x RPTs/sales | N | N | N | Y | Y |
| Constant, other control variables | Y | Y | Y | Y | Y |
| No. of Observations | 3165 | 3165 | 3165 | 3165 | 3165 |
| No. of firms | 571 | 571 | 571 | 571 | 571 |
| Within $R^2$ | 0.2629 | 0.2679 | 0.2708 | 0.2776 | 0.2759 |

## Table 6: Related-Party Transactions and Firm Value: *Chaebol* Firms

Sample is limited to *chaebol* firms. Firm fixed effects regressions of *ln*(Tobin's q) on *KCGI*, RPT/sales, interaction term, and control variables. To construct an "Expropriation Risk Index" to capture likelihood of expropriation, we compute cash flow rights differential (controlling family's fractional cash flow rights in counterparty – rights in firm concerned) for each firm-counterparty pair, in each year. Index = ∑ (RPT/sales * differential) for each firm in each year. If counterparty is an individual family member, its cash flow rights = 1. The Index is winsorized at 1% and 99%. Other control variables are the same as in Table 4, regression (1). Sample for columns (3) and (4) is firms with mean Expropriation Index (over all sample years) > 0; sample for column (5) is firms with mean Index ≤ 0. Sample in column (4) is further limited to 14 *chaebol* groups that were designated as such by Korean Fair Trade Commission conglomerate throughout the sample period and four groups spun off from the original 14. All regressions use unbalanced panels and year dummies. *t*-values, based on standard errors with firm clusters, are in parentheses. Significant results (at 5% level or better) are shown in **boldface.**

| **Dependent variable: *ln*(Tobin's *q*)** | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| *Chaebol* | All | All | All | All | Top 14 | All |
| Mean Expropriation Risk Index | All | All | All | > 0 | > 0 | ≤ 0 |
| *KCGI* | | 0.0021 | 0.0006 | -0.0013 | 0.0014 | 0.0023 |
| | | (1.25) | (0.35) | (-0.44) | (0.54) | (1.11) |
| x RPTs/sales | | | 0.0038 | **0.0094*** ** | **0.0106*** ** | -0.0037 |
| | | | (1.44) | **(2.85)** | **(3.17)** | (-1.08) |
| RPTs/sales | -0.0352 | -0.0268 | -0.2298 | **-0.5571*** ** | **-0.5911*** ** | 0.1932 |
| | (-0.51) | (-0.40) | (-1.47) | **(2.76)** | **(2.86)** | (1.02) |
| Constant, other control variables | Y | Y | Y | Y | Y | Y |
| No. of Observations | 428 | 428 | 428 | 221 | 174 | 207 |
| No. of firms/large firms | 109/37 | 109/37 | 109/37 | 58/14 | 42/14 | 51/23 |
| Within $R^2$ | 0.25 | 0.26 | 0.27 | 0.26 | 0.31 | 0.41 |

## Table 7: Corporate Governance and Tunneling

Firm fixed effects regressions of EBITDA/assets on industry EBITDA/assets, *KCGI* (it subindices), *ln*(assets), and interaction terms. Regression design is adapted from Bertrand, Mehta and Mullainathan (2002). Industry EBITDA/assets = (EBITDA summed across all other firms in the same 4-digit industry)/(assets summed across all other firms in the same 4-digit industry). Regression (4) uses large firm *IV* 2000 (= 1 if firm is large and year is 2000 or later, 0 otherwise) to instrument for Board Structure Subindex. In the first stage for this regression, large firm *IV* 2000 takes a coefficient of 8.81 ($t$ = 18.80). Sample for regression (5) is firms with Expropriation Risk Index (ERI) missing or mean ERI < 0; sample for regression (6) is firms with mean ERI > 0, Observations are identified as outliers if a studentized residual from regressing the dependent variable on *KCGI* is greater than ±1.96. All regressions use unbalanced panels, year dummies, and firm clusters. $t$-values, based on White's heteroskedasticity-consistent standard errors, are reported in parentheses. Significant results (at 5% level or better) are shown in **boldface.**

| **Dependent var.: EBITDA/Assets** | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| **Sample** | all | all | all | all | ERI missing or mean < 0 | mean ERI > 0 |
| **2SLS regression** | no | no | no | yes | no | no |
| *KCGI* | | -0.0002 | | | -0.0000 | -0.0005 |
| | | (-1.01) | | | (-0.11) | (-1.36) |
| x Industry EBITDA/assets | | **0.0043**** | | | 0.0019 | **0.0067**** |
| | | **(2.38)** | | | (0.80) | **(2.23)** |
| Board Structure Subindex | | | -0.0003 | | | |
| | | | (-0.81) | | | |
| x Industry EBITDA/assets | | | **0.0141**** | | | |
| | | | **(2.39)** | | | |
| Instrumented Board Structure Subindex | | | | -0.0005 | | |
| | | | | (-0.72) | | |
| x Industry EBITDA/assets | | | | **0.0206**** | | |
| | | | | **(2.44)** | | |
| Industry EBITDA/assets | **0.2092***** | 0.0537 | 0.0677 | -0.0880 | 0.1286 | -0.0447 |
| | **(6.54)** | (0.72) | (0.42) | (-0.44) | (1.45) | (-0.31) |
| Other subindices of *KCGI* | N | N | Y | Y | N | N |
| Other subindices x Industry EBITDA/assets | N | N | Y | Y | N | N |
| *ln*(assets) | Y | Y | Y | Y | Y | Y |
| *ln*(assets) x Industry EBITDA/assets | N | N | N | Y | N | N |
| Constant, other control variables | Y | Y | Y | Y | Y | Y |
| No. of Observations | 3959 | 3959 | 3959 | 3959 | 3465 | 518 |
| No. of firms | 685 | 685 | 685 | 685 | 608 | 115 |
| Within $R^2$ | 0.1086 | 0.1119 | 0.1157 | 0.1173 | 0.1113 | 0.1924 |

## Table 8: *KCGI* and Investment

Firm fixed effects and random effects regressions of capital expenditures (100*Capex/assets) on *KCGI*, subindices, EBIT/sales, Tobin's *q*, and control variables, as shown. Sample excludes financial institutions. Observations are identified as outliers and excluded if a studentized residual from yearly regressions of Capex/assets on *KCGI* is greater than ±1.96. Control variables are the same as in Table 4, Regression (2), except we omit Capex/PPE due to overlap with dependent variable, and omit share turnover, foreign ownership, ADR dummies, and MSCI dummy which are relevant in predicting firm value, but have no obvious connection to capex. In first stage for regressions (5), coefficient on large firm *IV* 2000 is8.64 ($t$ = 14.01). All regressions use unbalanced panels, year dummies, and firm clusters. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. $t$-values, based on White's heteroskedasticity-consistent standard errors, are in parentheses. $R^2$ is within $R^2$ for fixed effects; overall $R^2$ for random effects. Significant results (at 5% level or better) are in **boldface.**

| **Dependent var: 100*capex/assets** | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| **Fixed or random effects** | fixed | random | fixed | random | fixed | random |
| *KCGI* | -0.0127 | **-0.0166**** | | | | |
| | (-1.25) | **(-2.01)** | | | | |
| Board Structure Subindex | | | **-0.0751***** | **-0.0716***** | | |
| | | | **(-3.09)** | **(-3.36)** | | |
| Instrumented Board Structure Subindex | | | | | **-0.1437***** | **-0.1038**** |
| | | | | | **(-2.73)** | **(-2.45)** |
| Ownership Parity Subindex | | | -0.0455 | **-0.0845***** | -0.0439 | **-0.0824***** |
| | | | (-1.14) | **(-2.88)** | (-1.10) | **(-2.81)** |
| EBIT/Sales | -0.7740 | -1.6050 | -0.8805 | -0.9503 | -0.9774 | -1.0302 |
| | (-0.34) | (-0.85) | (-0.40) | (-0.52) | (-0.45) | (-0.57) |
| Tobin's *q* | 0.3260 | **0.4461**** | 0.3680 | **0.6091***** | 0.3979 | **0.6264***** |
| | (1.28) | **(2.13)** | (1.47) | **(2.80)** | (1.57) | **(2.88)** |
| Constant, other control variables | Y | Y | Y | Y | Y | Y |
| Other subindices | | | Y | Y | Y | Y |
| No. of observations | 3564 | 3564 | 3564 | 3564 | 3564 | 3564 |
| No. of firms | 627 | 627 | 627 | 627 | 627 | 627 |
| $R^2$ | 0.0487 | 0.2691 | 0.0546 | 0.1069 | 0.0550 | 0.1044 |
| Random effects lambda | | 0.5447 | | 0.6134 | | 0.6135 |
| Hausman p-value (fixed v random) | | 0.0000 | | 0.0000 | | 0.0000 |

## Table 9: Sensitivity of Investments to Profitability and Growth Opportunities

Firm fixed effects and random effects regressions of capital expenditures (100*capex/assets) on *KCGI*, subindices, EBIT/sales, Tobin's *q*, and control variables, as shown. Sample excludes financial institutions. Regressions (5)-(6) are similar to regressions (1)-(2), but add interaction between governance and EBIT/sales; regressions (7)-(8) add interactions between governance and Tobin's *q*. Observations are identified as outliers if a studentized residual from yearly regressions of Capex/Assets on *KCGI* is greater than ±1.96. Control variables are the same as in the previous table. All regressions use unbalanced panels, year dummies, and firm clusters. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. *t*-values, based on White's heteroskedasticity-consistent standard errors, are in parentheses. Joint significance of interaction terms is from F-test. $R^2$ is within $R^2$ for fixed effects; overall $R^2$ for random effects. Significant results (at 5% level or better) are shown in **boldface.**

| **Dependent var.: 100*capex/assets** | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| **Fixed or random effects** | fixed | random | fixed | random | fixed | random |
| Use lagged governance measure(s) | No | No | No | No | Yes | Yes |
| KCGI [lagged where shown] | **-0.0408**** | **-0.0437**** | | | -0.0318 | -0.0379* |
| | **(-2.06)** | **(-2.56)** | | | (-1.23) | (-1.80) |
| x EBIT/ Sales | 0.1047* | 0.1043* | | | **0.2268***** | **0.1906***** |
| | (1.72) | (1.96) | | | **(2.80)** | **(2.81)** |
| x Tobin's *q* | 0.0231 | 0.0223 | | | 0.0057 | 0.0134 |
| | (1.24) | (1.42) | | | (0.23) | (0.70) |
| joint signif of interactions | | | | | | |
| Board Structure Subindex | | | -0.0949 | **-0.1538***** | | |
| | | | (-1.48) | **(-2.70)** | | |
| x EBIT/ Sales | | | 0.1964 | 0.1864 | | |
| | | | (0.75) | (0.86) | | |
| x Tobin's *q* | | | 0.0045 | 0.0747 | | |
| | | | (0.07) | (1.28) | | |
| *Ownership Parity* | | | -0.0423 | -0.0879 | | |
| | | | (-0.54) | (-1.43) | | |
| x EBIT/ Sales | | | 0.4510 | 0.4631* | | |
| | | | (1.48) | (1.71) | | |
| x Tobin's *q* | | | -0.0220 | -0.0219 | | |
| | | | (-0.30) | (-0.36) | | |
| EBIT/sales | -4.1624 | **-5.1894**** | -7.4693 | -8.3696* | **-8.7458**** | **-9.1635***** |
| | (-1.53) | **(-2.05)** | (-1.37) | (-1.68) | **(-2.33)** | **(-2.82)** |
| Tobin's *q* | -0.4688 | -0.3372 | -0.2252 | 0.2256 | -0.0008 | -0.0292 |
| | (-0.68) | (-0.56) | (-0.15) | (0.17) | (-0.00) | (-0.04) |
| Constant, other control vars. | Y | Y | Y | Y | Y | Y |
| Other subindices of *KCGI* | N | N | Y | Y | N | N |
| Other subindices and interactions | N | N | Y | Y | N | N |
| No. of Observations | 3,564 | 3,564 | 3,564 | 3,564 | 2729 | 2729 |
| No. of firms | 627 | 627 | 627 | 627 | 592 | 592 |
| $R^2$ | 0.0513 | 0.2710 | 0.0578 | 0.1086 | 0.056 | 0.287 |
| Hausman test p-value | | Fill in | | Fill in | | 0.0000 |

## Table 10: Corporate Governance and Sales Growth

Firm fixed effects regressions of sales growth (fractional increase in sales in year *t*, relative to prior year) on governance, profitability, interaction terms, and control variables. Control variables are the same as in the capital expenditure table (Tables 8 and 9), except include Capex/PPE and omit sales growth due to overlap with the dependent variable. Regression (3) uses large firm *IV* 2000 to instrument for Board Structure Subindex. In the respective first stage regressions, large firm *IV* 2000 takes a coefficient of 8.64 (*t* = 18.74). Observations are identified as outliers if a studentized residual from yearly regressions of sales growth on *KCGI* is greater than ±1.96. All regressions use unbalanced panels, year dummies, and firm clusters. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. *t*-values, based on White's heteroskedasticity-consistent standard errors, are in parentheses. Significant results (at 5% level or better) are shown in **boldface.**

| **Dependent var.: Sales Growth** | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **2SLS regression** | no | no | yes | no | no |
| *KCGI* | **-0.0023**** | | | **-0.0021**** | |
| | **(2.47)** | | | **(2.14)** | |
| x EBIT/Sales | | | | -0.0023 | |
| | | | | (0.32) | |
| Board Structure Subindex | | -0.0033 | | | **-0.0050**** |
| | | (1.53) | | | **(2.17)** |
| x EBIT/ Sales | | | | | **0.0371***** |
| | | | | | **(2.89)** |
| Instrumented *Board Structure* | | | -0.0054 | | |
| | | | (1.42) | | |
| x EBIT/ Sales | | | | | |
| *Ownership Parity* | | **-0.0093***** | **-0.0092***** | | **-0.0089***** |
| | | **(2.72)** | **(2.69)** | | **(2.70)** |
| x EBIT/ Sales | | | | | 0.0264 |
| | | | | | (1.24) |
| Other subindices of KCGI | N | Y | Y | N | Y |
| Other subindices x EBIT/Sales | N | N | N | N | Y |
| *ln*(assets) | Y | Y | Y | Y | Y |
| *ln*(assets)*EBIT/sales | N | N | N | N | N |
| Constant, other control variables | Y | Y | Y | Y | Y |
| No. of Observations | 4110 | 4110 | 4110 | 4110 | 4110 |
| No. of firms | 693 | 693 | 693 | 693 | 693 |
| Within $R^2$ | 0.1257 | 0.1273 | 0.1272 | 0.1258 | 0.1328 |

## Table 11: Corporate Governance and Dividend Policy

Firm fixed effects regressions of dividends (100*dividends/sales) on *KCGI*, its subindices, profitability, interaction terms, and control variables. Observations are identified as outliers and excluded if a studentized residual from yearly regressions of the dependent variable on *KCGI* is greater than ±1.96. Control variables are the same as in Table 7 except include Capex/*PPE*. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. All regressions use unbalanced panels, year dummies, and firm clusters. *t*-values, based on White's heteroskedasticity-consistent standard errors, are in parentheses. Significant results (at 5% level or better) are shown in **boldface.**

| **Dependent var.: 100*Dividends/Sales** | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| *KCGI* | **0.0074**** | 0.0024 | | |
| | **(2.06)** | (0.69) | | |
| x EBIT/sales | | **0.0827***** | | |
| | | **(4.98)** | | |
| Board Structure Subindex | | | -0.0026 | -0.0045 |
| | | | (-0.27) | (-0.52) |
| x EBIT/sales | | | | 0.0083 |
| | | | | (0.10) |
| Ownership Parity Subindex | | | 0.0139 | 0.0117 |
| | | | (1.30) | (1.14) |
| x EBIT/sales | | | | 0.0084 |
| | | | | (0.14) |
| Disclosure Subindex | | | **0.0271***** | 0.0145 |
| | | | **(3.04)** | (1.60) |
| x EBIT/sales | | | | **0.1754***** |
| | | | | **(3.00)** |
| Shareholder Rights Subindex | | | -0.0011 | -0.0089 |
| | | | (-0.20) | (-1.40) |
| x EBIT/sales | | | | **0.1675**** |
| | | | | **(2.46)** |
| Other subindices of *KCGI* | N | N | Y | Y |
| Other subindices x *EBIT*/sales | N | N | N | Y |
| *ln*(assets) | Y | Y | Y | Y |
| Constant, other control variables | Y | Y | Y | Y |
| No. of observations | 4083 | 4083 | 4083 | 4083 |
| No. of firms | 692 | 692 | 692 | 692 |
| Within $R^2$ | 0.0880 | 0.1082 | 0.0947 | 0.1225 |

## Table 11: Board Structure and Lagged Profitability

Firm fixed effects regressions of EBIT/assets on lagged Board Structure Subindex (or Board Independence Subsubindex), remainder of *KCGI,* and control variables. Regression (2) uses Large Firm *IV 2000* to instrument for Board Structure Subindex. In the first stage regression, Large Firm *IV 2000* takes a coefficient of 9.05 ($t$ = 18.51). Observations are identified as outliers and excluded if a studentized residual from yearly regressions of EBIT/assets on lagged Board Structure Subindex (regressions (1)-(2)) or lagged Board Independence Subsubindex (regression (3)) is greater than ±1.96. All control variables are lagged, and are the same as in Table 10, except exclude Tobin's $q$. 2004 sole ownership data is extrapolated to later years. All regressions use unbalanced panels, year dummies, and firm clusters. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. $t$-values, based on White's heteroskedasticity-consistent standard errors, are in parentheses. Significant results (at 5% level or better) are shown in **boldface.**

| Dependent variable: EBIT/assets | (1) | (2) | (3) |
|---|---|---|---|
| Board Structure Subindex (t-2) | **0.0009**** | | |
| | **(2.54)** | | |
| Instrumented Board Structure Subindex (t-2) | | 0.0011* | |
| | | (1.88) | |
| (*KCGI* – Board Structure Subindex) (t-2) | -0.0001 | -0.0001 | |
| | (0.60) | (0.72) | |
| Board Independence Subsubindex (t-2) | | | **0.0016***** |
| | | | **(2.98)** |
| (*KCGI* – Board Independence Subsubindex) (t-2) | | | -0.0000 |
| | | | (0.26) |
| *ln*(assets) | Y | Y | Y |
| Constant, other control variables | Y | Y | Y |
| Observations | 3698 | 3698 | 3694 |
| Number of firms | 667 | 667 | 667 |
| within $R^2$ | 0.1032 | 0.1016 | 0.1024 |