Corporate Governance, Business Groups, and Market Value: Time-Series Evidence from Turkey

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Abstract. Business groups play a large, sometimes dominant economic role in many countries. A number of studies find an association between *firm-level* corporate governance and market value, but none study the role of business group identity in firm level corporate governance or the value of "group governance." We begin to fill that gap through a case study of Turkey. We study the corporate governance practices of Turkish business groups and listed firms from 2006 to 2012, relying on hand-collected data covering the vast majority of listed firms. We build a Turkey Corporate Governance Index (*TCGI*), composed of subindices for board structure, board procedure, disclosure, ownership, and shareholder rights. This index predicts higher market value (proxied by Tobin's *q*) at both the firm level (with firm fixed effects) and group level (with group fixed effects); the principal driver of this result is disclosure subindex. We find large differences in the governance choices of different business groups. Some groups invest in governance; others do not; and investors reward those that do with higher market values for group firms.

CONTENTS

1. INTRODUCTION

Studies in a number of countries find an association between firm-level corporate governance and firm market value (often proxied by Tobin's q). However, in many countries, business groups, often family controlled, play a major role and largely dictate the governance choices made by group-affiliated firms through various means of influence. No prior study examines how governance varies across business groups or how "group governance" affects the market value of individual group firms, or the group as a whole. We begin to fill that gap, by studying business groups in Turkey. We also contribute a case study of Turkey to the literature on whether firm-level governance predicts market value, using panel data, extensive covariates, and firm fixed effects (FE), where most of this literature uses a weaker *OLS* specification.

Relying largely on data from firm annual reports and public disclosures, we build a broad Turkey Corporate Governance Index (*TCGI*) over 2006-2012, covering almost all publicly traded Turkish firms and the 18 major Turkish business groups. *TCGI* is comprised of five equally weighted subindices, for Board Structure, Board Procedure, Disclosure, Ownership Structure, and Minority Shareholder Rights. The elements of each subindex reflect Turkey-specific norms and institutions in addition to elements widely used in literature. At the firm level, *TCGI* predicts higher Tobin's q. The principal subindex driving this result is disclosure subindex. We also find large differences in the governance choices of different business groups and similarity of choices across the firms affiliated with the same group. Some groups invest in governance; others do not; and investors reward those that do with higher market values.

We study group governance for 18 Turkish business groups with at least two publicly traded member firms. At the group level, group governance predicts group Tobin's q; the principal subindices that predict group q are disclosure and ownership structure.

Turkey is an interesting country to study for several reasons. It is an important middle-income developing market. Historically, legal rules and institutions have been weak, giving firms and business groups great flexibility to choose governance practices. The stock market is dominated by a handful of

group-affiliated firms. Access to finance is an important constraint on growth for many Turkish firms (World Bank, 2010). Foreign investment – both direct and portfolio investment – is extremely important; foreign investors own around 65% of the market capitalization of the Turkey stock market, Borsa Istanbul (formerly the Istanbul Stock Exchange) (Capital Markets Board of Turkey, 2011). Better governance can help firms and groups raise capital. Yet governance may also limit controllers' ability to engage in intra-group transactions or other forms of self-dealing.

This paper proceeds as follows. Part 2 provides a literature review and background on Turkish corporate governance and business groups. Part 3 describes our data sources and the construction of *TCGI*. Part 4 develops our empirical strategy. Part 5 presents our firm-level results; part 6 presents group-level results. Part 7 concludes.

2. LITERATURE REVIEW AND BACKGROUND

In this review, we put aside multi-country studies of the effects of *country*-level governance on financial markets and firms, and focus on the effects of *firm*-level governance. We also focus on studies of emerging markets, which present different governance issues than developed markets (e.g., Bebchuk and Hamdani, 2009). Our review is selective. For a comprehensive review we refer to Claessens and Yurtoglu (2013).

2.1. GOVERNANCE-TO-VALUE STUDIES

Prior firm-level studies can be divided into those which examine whether a firm-level measure of corporate governance predicts firm market value, usually proxied by Tobin's q ("governance-to-value" studies), and those which study the factors that predict firm-level governance choices ("predict-governance studies"); some do both. We discuss here only governance-to-value studies. The principal multi-country studies are Klapper and Love (2004), Durnev and Kim (2005), Dahya, Dimitrov and McConnell (2008)

(focusing on board independence), Morey et al. (2009), Durnev and Fauver (2011), and Black et al. (2013).[1] In broad outline, there is evidence that if one builds a country-specific governance index, which is sensitive to local rules and institutions (as we do for Turkey), such an index predicts higher Tobin's q.

2.2. BUSINESS GROUPS AND CORPORATE GOVERNANCE

Despite the importance of business groups in many countries, empirical research on business groups is scarce. We are not aware of a prior study of group governance or its impact on firm governance, firm value, or group value.[2] The closest to our study is Masulis, Pham and Zein (2011), who study in cross-section the association between ownership of business group firms and firm-level Tobin's q and profitability. They do not study or control for other aspects of firm or group governance, and their sample includes both developed and emerging markets.

There is both cross-country and within-country variation in business group structure. Relevant aspects include degree of diversification, degree of vertical integration, manner of ensuring control (the available means include pyramids, cross-holdings, and high-voting shares), inclusion of a group bank, existence of a single parent "holding company", and ownership (single family versus multifamily versus non-family). The major Turkish groups we study here all include a holding company. Some include a group bank but others do not. Of the 18 groups, 13 are controlled by a single family, three by two families, one by its management (the controller is the company pension fund) and one by the Turkish Armed Forces

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[1] A representative list of single-country governance to value studies might include Brazil (Braga-Alves and Shastri, 2011; Black, de Carvalho and Gorga, 2012; Leal and Carvalhal da Silva, 2007); Hong Kong (Cheung et al., 2007, 2011; Lei and Song, 2012); India (Balasubramanian, Black and Khanna, 2010; Sarkar, Sarkar and Sen, 2012); Korea (Black, Jang and Kim, 2006a, Black and Kim, 2012); Russia (Black, Love and Rachinsky, 2006; Black, 2001; Kuznecovs and Pal, 2012); and Thailand (Limpaphayom and Connelly, 2004; Kouwenberg, 2006).

[2] On business groups generally, within the finance literature, see, e.g., Almeida and Wolfenzon (2006); Khanna and Yafeh (2007); Morck, Wolfenzon, and Yeung (2005). Almeida et al. (2011) provide a case study of Korea. Within the management literature, see, e.g., Yiu et al. (2007); Boyd and Hoskisson (2011); Khanna and Palepu (2000).

pension fund. Turkish business groups often use pyramidal structures, with two or more pyramid levels. Table 1 provides summary information on the 18 major Turkish business groups.

Yiu et al. (2007) categorize groups along the strength of vertical and horizontal connections[3]. Turkish groups exhibit strong vertical equity links through pyramids, concentrated control rights of the controlling families, and strong presence of controlling families in the boards of affliated companies. Turkish groups also have strong horizontal ties through board ties and interlocks and also through resource exchange between member firms. Ararat, Orbay and Yurtoglu (2010) report that 18 percent of board members in their sample are members of the controlling family and 27 percent are employees of a parent or related company. These fractions are higher for group-affiliated firms. Prior studies on Turkish groups stress that groups serve as a tool to centralize decision making to assure continuity without compromising the family control (Bugra, 1994; Colpan, 2010).

A standard explanation for business groups in less-developed markets is that they substitute for imperfect markets in capital and intermediate products (Leff, 1978); this explanation fits Turkey well. Group firms may receive funding from other group members or have acess to lending from group bank and hence face less market pressure to improve their governance.[4]

Business groups, much like firms, can invest in governance or not, and can develop good or bad reputations for how they treat minority shareholders (Khanna and Palepu, 2000). In contrast, the vast majority of the literature on business groups treats group-affiliated firms as a homogenous category and

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[3] Goto (1982) offers a similar categorization.

[4] Supporting this view, Gopalan, Nanda and Seru (2007) find that intragroup loans are used to transfer cash across group firms to support financially weaker firms. An important reason for providing support may be to avoid default by a group firm and consequent negative spillovers to the rest of the group. A related hypothesis is that groups facilitate mutual insurance among affiliated firms, for which Khanna and Yafeh (2005) report no evidence outside Japan, Korea, and Thailand in their sample of 11 countries including Turkey.

highlight their differences to non-affiliated firms. There are a large number of studies of this type and they report mixed results of the effects of group-affiliation on firm value and performance.[5]

On the other hand, a nascent literature focuses on specific aspects of governance and relates it to firm value for group and non-group firms. Baek, Kang and Park (2004) study the effects of Asian crisis on Korean firms and report that chaebol firms with concentrated ownership by controlling family shareholders experienced a larger drop in the value of their equity. Firms in which the controlling shareholders' voting rights exceeded cash flow rights and those who borrowed more from the main banks also had lower returns, suggesting that firm value during the crisis was a function of firm-level governance and chaebol affiliation. Claessens, Fan and Lang (2006) investigate the effects of group affiliation in nine East Asian economies and find that mature and slow-growing firms with ownership structures more likely to create agency problems gain more from group affiliation, while young and high-growth firms lose more. Bertrand et al. (2008) focus on the relationship between owner-family characteristics and performance of the largest groups in Thailand. They find an association between the availability of more sons and lower firm-level performance, especially when the founder is dead, which suggests a race to the bottom in tunneling resources out of the group firms. Bertrand, Mehta and Mullainathan (2002) study potential tunneling in Indian business groups and report that groups which tunnel less are valued more. They also report that group firms where the controlling shareholders have higher cash flow rights tunnel less and are valued more. In a comprehensive cross-country study on business group firms by Masulis and his colleagues (2009) report that family group firm performance improves as the direct ownership increases, and declines when dual-class shares and cross shareholdings are employed as additional control-enhancing mechanisms relative to other member-firms as they intensify moral hazard concerns. Their results differ for non-family groups.

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[5] For example, Khanna and Palepu (2000) and Fisman and Khanna (2004) report a positive effect of group membership in India. Ferris, Kim and Kitsabunnarat (2003) find that chaebol-affiliated Korean firms suffer a value loss compared to non-affiliated firms. Khanna and Yafeh (2007) provide a survey this literature.

Despite the importance of business groups, we are not aware of a prior effort to study whether business group identity and business group characteristics other than ownership structures predict firm or group market value.

Corporate governance initially became a concern in Turkey initially for banks, in reaction to the banking crisis of 2000, which was caused by related-party lending (Economist, 2000; Alper and Önis, 2002). Ugur and Ararat (2006) argue that greater macroeconomic stability after 2001 encouraged corporate governance reforms by Turkish firms. The Turkish securities regulator, the Capital Markets Board of Turkey (CMBT) initially followed a soft law approach, issuing Corporate Governance Guidelines largely following the OECD's corporate governance guidelines in 2003, most provisions of which were recommended but not mandatory for firms. Banks were subject to stricter governance rules imposed upon by the banking regulatory agency. Starting in 2005, firm annual reports were required to include a "Corporate Governance Compliance Report (CG Report)" indicating which guidelines they had met and if not, explaining why not (Ararat, 2011).

Beginning in 2007, Borsa Istanbul (BIST)6 created a "Corporate Governance Index" (BIST CG Index; XKUR) comprised of firms which met at least 70% of the Guidelines. The BIST CG Index initially covered only 6 firms; and currently (January 2014) includes 48 firms. The performance of the index is not significantly different than its peers (Sengur, 2011). In addition, S&P, in cooperation with one of us, conducted annual "transparency and disclosure (T&D)" surveys of roughly 50 of the largest Turkish firms over 2005-2008 (see Ararat and Balic, 2008). These surveys found a large improvement in T&D scores over 2005-2006 largely due to mandatory adoption of International Financial Reporting Standards, but little change over 2006-2008, and limited variation between firms from 2006 on. Most firms complied with legal requirements, but did little more. Ararat, Orbay and Yurtoglu (2010) report that during 2006-2008, statutory

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[6] Formerly Istanbul Stock Exchange

board independence was unrelated to equity issuance and that higher board independence predicted lower Tobin's *q*.

3. DATA SOURCES AND METHODOLOGY

In this section, we detail our data sources (3.1) and how we construct *TCGI*, the Turkish corporate governance index (3.2). Section 3.3 assesses the validity of *TCGI* as measure of corporate governance. Section 3.4 presents our empirical strategy and section 3.5 discusses our control variables.

3.1. DATA SOURCES

We manually collect governance data on corporate governance practices for all companies listed on the Borsa Istanbul over 2006-2012. Our principal sources are firm annual reports, CG Reports, and charters. We collect data on all publicly listed companies in each year, excluding investment trusts, banks, government-controlled firms, and subsidiaries of foreign firms.

Financial data come from the Turkish financial database StockGround, provided by Rasyonet (http://www.rasyonet.com/_eng/index.html). Information on cross-listed firms, including the foreign exchange(s) they are listed on, comes from databases at the Bank of New York (www.adrbny.com), Citibank (wwss.citissb.com/adr/www/brokers/index.htm, Deutsche Bank (https://www.adr.db.com/) and JP Morgan (www.adr.com). We borrow data on firm ownership, business group membership, and the control group's cash flow and voting rights for 2006, 2008 and 2011 from Akbas and Yurtoglu (2013); we interpolate this data for other years.

We obtain data on related-party transactions from footnotes to annual financial statements; and listing year from the *BIST.*. We map industry classifications assigned by the *BIST* to 2 and 4 digit US SIC codes (subdividing the BIST groups when necessary) for more homogenous categorization and easier comparability to other countries.

3.2. CONSTRUCTION OF GOVERNANCE INDEX AND SUBINDICES

To develop *TCGI*, its component subindices and the elements of each subindex, we begin with indices developed for Brazil (Black, De Carvalho and Gorga, 2012), India (Balasubramanian, Black and Khanna, 2011), and Korea (Black, Jang, and Kim, 2006). We adapt these indices to Turkey. We add elements which, in our judgment, are important in Turkey, and remove elements which are not meaningful in Turkey, for which data is not available, which do not have significant variation across firms, or are too similar to another element. Hence, we do not include attributes required by Turkish law.

TCGI is composed of five sub-indices, which in turn include 47 elements. Most elements are suggested by prior research as potential indicators of good governance. All elements (except fractional ownership by the control group and the "wedge" between voting rights and economic ownership) are coded as "1" if a firm has the attribute and "0" otherwise. Table 2 describes the subindices and elements, and provides summary statistics. The five subindices are detailed below:[7]

Board Structure (8 elements): Board independence is a key factor in corporate governance (Dahya, Dimitrov and McConnell, 2008; Black and Kim, 2012). Functioning audit committees can improve disclosure quality (Klein, 2002) and reduce cost of capital (Anderson, Mansi, and Reeb, 2004). To capture these factors, the board structure subindex includes elements for board independence, and audit committee existence and independence. This subindex also includes elements for separation of the CEO and board chair positions and existence of a Corporate Governance Committee.[8]

We discuss selected elements of Board Structure Subindex in detail, to illustrate how we construct *TCGI* and the need to build an index that reflects Turkish practices. One element asks whether a firm has

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[7] To code the wedge between voting rights and economic control as larger if the wedge is small, we define ownership parity = 1- (fraction of control rights - fraction of cash flow rights). An appendix, available on request from the authors, explains more fully our reasons for including each element in *TCGI*.

[8] This committee became mandatory in 2012, after the end of our sample period.

one or more independent directors; a second element asks whether a firm has *more than one* independent director. In many countries, these would be silly questions; the answer would be "of course", due to either custom or a legal requirement for a minimum number of independent directors. In Turkey, these are not silly. Indeed, in 77% of firm-years, the firm has no independent directors at all! Conversely, there is little point in including an element asking whether the board has a majority of independent directors; only 1% of firm-years have this feature.

A third element of Board Structure Subindex asks whether the CEO is a member of the board of directors. In many countries, the answer would again be "of course". In Turkey, this is found for 57% of firm-years. One might further ask, why is CEO membership on the board a positive aspect of firm governance? Our judgment was that CEO absence from the board reflects a governance weakness, because it weakens the flow of information from management to the board or in many cases indicates the reluctance of the controlling shareholders to delegate power to outsiders. In the second case, a designated member of the board, frequently a family member categorized as a non-executive director, is the real head of the executive function. These examples also highlight the need to exercise judgment on which elements to include in the index. Others might easily make different judgments.

Board Procedures (5 elements): Prior studies include internal procedures of boards as components of governance indices (Black, Kim, Jang, and Park, 2013). The index focuses on five elements which assess the functioning of the board; whether there is a corporate governance charter or board charter that governs the board process; whether the firm has a code of ethics, or conduct; whether the firm has a functioning audit committee proxied by the disclosure of its charter and members; and whether there is an internal control or audit function. Although we have to rely on firms' disclosure for coding these elements and non-disclosure does not necessarily mean the absence of an element, disclosure is a good indication of the strength of an element.

Disclosure (24 elements): Prior research documents an association between corporate disclosure and firm market value (Durnev and Kim, 2005). Lambert, Leuz and Verrecchia (2007) posit that increased public disclosure reduces the appropriation of cash flows by managers and controlling shareholders and the cost of monitoring insiders. The Disclosure sub-index contains 21 elements. The elements reflect the transparency of financial information; material events; roles, backgrounds and ownership of directors and senior managers; major shareholders, share classes and voting rights; important charters and codes of conduct; aspects of ownership structure; important events and board activity. Disclosure of the firm charter (the key document that governs the shareholder rights in each firm prior to the enactment of the new Turkish Commercial Code in 2012), and the explicit disclosure of mandatory Corporate Governance Compliance Reports are the other elements of the Disclosure Index.

Ownership Structure (6 elements): A disparity between cash flow rights and voting rights can provide incentives for self-dealing, and is associated with lower firm value in East Asia (Claessens, Djankov, Fan, and Lang, 2002). Many companies in Turkey create such a disparity by using pyramidal ownership structures and dual-class shares (Yurtoglu, 2000). The ownership structure subindex includes the largest shareholder's fractional ownership of voting shares; the disparity between this group's voting and economic rights; whether one or more class of shares has special nomination rights for appointments to the board; and whether there are large outside blockholders with more than 5% of shares who can monitor the controlling shareholder..

Shareholder Rights (4 elements): Shareholder rights and the ability of shareholders to influence the behavior of corporations is considered to be a key element in corporate governance (OECD, 2004). We use 6 elements that influence shareholders' ability to participate in important decisions, receive fair and transparent treatment, and use of voting rights. The elements of this sub-index reflect whether the firm has classes of shares with multiple voting or board nomination rights, whether there exist founder certificates

which entitle the holders with special cash flow rights, whether the firm has a policy related with the trading of control shares and has an investor relations department.

We extrapolate for missing elements as follows: if an element is available in year t, but not in year $t+1$ (t-1), we extrapolate year t value to year $t+1$ (t-1). We intrapolate for missing elements as follows: if an element is available in years t and $t+2$, but not year $t+1$, we use in year $t+1$ the average of the t and $t+2$ values. Within each sub-index, we give equal weight to each element. If data on a subindex element is missing for a particular firm, we compute the subindex using the average of the nonmissing elements.

We rescale so each subindex runs from 0 to 100. *TCGI* score is an average of the subindex scores. Table 2 shows the governance attributes used to construct *TCGI* and the sub-indices. Table 3 provides summary statistics on the *TCGI*. *TCGI* values range from 10.22 to 82.97, with a mean of 46.73. Figure 1 visualizes the change in non-normalized *TCGI* and its subindices over time. We observe that there is little change over time with most of the improvement in *TCGI* coming in 2009 and in 2011 mainly through better scores of the disclosure subindex indicating that governance practices did not change much over these years in Turkey.

Panel B provides Pearson correlation coefficients between *TCGI* and its subindices. *TCGI* is correlated positively with each subindex; with correlation coefficients from 0.19 to 0.93. However, some of this correlation is by construction, and arises because each subindex is a component of *TCGI*. To adjust for this, we report in the second row the correlation between each subindex and the complement to that subindex, defined as the average of the other four subindices. The correlation remains fairly high for Disclosure (0.58) and Board Procedures (0.62), but is low for the Ownership Structure (0.07) and moderate at 0.24-0.46 for Minority Shareholder Rights and Board Structure subindices. The inter-subindex correlations are generally positive but moderate. Thus, there is limited colinearity beween subindices, except for the Disclosure subindex.

For regressions, we normalize each subindex to mean 0, σ = 1, thus giving each roughly equal weight. We then sum the normalized subindices, and normalize the sum; *TCGI* is thus a renormalized sum of normalized subindices. The histogram of normalized *TCGI* (pooled over 2006-2012) in Figure 2 shows that there is substantial spread in the normalized *TCGI*.

3.3. CONSTRUCT VALIDITY

TCGI is a construct with which we hope to accurately measure the theoretical, non-observable concept of corporate governance. While there is no direct way to quantify the gap between the construct and the underlying concept, Cronbach's α, a standard measure of the correlation between elements of a multipart measure, is used to indirectly indicate whether a set of elements measures a single unidimensional latent construct, but not whether the underlying construct is what one has posited it to be. In the psychological literature, if different elements are designed to capture different aspects of an underlying construct, which is how we built the country *TCGI* indices, α values above 0.7 are considered strong, and values above 0.6 are respectable (Kline, 2000).

Table 2 includes these results. For the *TCGI* , Cronbach's α is equal to 0.88, this strong α is driven mainly by Disclosure subindex (α = 0.86). The board structure and board procedures subindices have α's slightly above 0.60 and for the Ownership structure and Shareholder Rights subindices α's are around 0.40.

We also conduct an exploratory principal component analysis (PCA) first using the subindices and then the governance elements [9]. We retain only factors with an eigenvalue greater than unity. This reduced solution is then rotated using a *varimax* rotation which produces orthogonal factors. Following common PCA convention,[10] we associate each factor with elements that have a loading (or the correlation between

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[9] Other papers which use PCA to construct governance indices include Schofield (2014) and Larcker, Richardson and Tuna (2007). .We detail the results of the PCA in the Appendix.

[10] The use of an oblique rotation which allows the retained factors to be correlated produces very similar results.

the factor and an indicator) exceeding 0.40 in absolute value. [11] At the subindex level, only two factors have eigenvalues exceeding unity. Factor 1 loads primarily on board structure, board procedures, disclosure, and shareholder rights subindices; factor 2 loads on the ownership disclosure subindex. The two factors explain 62.8 % of the total variation. At the element level, 14 factors have eigenvalues exceeding unity. The first three factors are easy to interpret. Factor 1 and 2 load on different elements of the disclosure subindex; factor 3 loads on four elements of the board structure subindex. Most additional factors load on elements of more than one subindex. These 14 factors explain 64.8 percent of the total variance in the original data. The relatively clean loadings for the most important factors suggest that the elements of one subindex are often measuring similar factors, which are distinct from the elements of other subindices.

3.4 EMPIRICAL MODELS

We use the natural logarithm of Tobin's q (ln(Tobin's q)) as our primary dependent variable. We take logs to reduce the influence of high-q outlier firms, but obtain similar results if we use non-logged q. We also employ alternative dependent variables such as the natural logarithm of the ratio of the market value of equity to the book value of equity ln(*Market/Book*) and the ratio of EBIT (Earnings before interest and taxes) to assets *(EBIT/Assets)*. In our base specification, we exclude outliers, for which a studentized residual from regressing the dependent variable (ln(Tobin's q) on *TCGI* (year-by-year for panel regressions) > |1.96|. We then regress ln(Tobin's q) on normalized *TCGI*, its sub-indices and a set of control variables. We use two different econometric models. The first model has the following specification:

$$ln \, q_{i,t} = \beta_0 + \beta_1 * \boldsymbol{X_i} + \beta_2 * TCGI_{i,t} + g_t + \varepsilon_{i,t} \quad (1 - Pooled \; OLS)$$

where:

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[11] A common rule of thumb is to count components with weights > 0.4 (Acock, 2013, ch. 1). We apply a stricter standard and treat factors as loading on subindices or elements if coefficient > 0.6. For the factors discussed in text, all other loadings are < 0.4.

$\ln q_{i,t}$ is the natural logarithm of Tobin's q for firm i at time t;

$\mathbf{X_i}$ is a vector of firm characteristics;

$TCGI_{i,t}$ is the Turkish corporate governance index for firm i at time t;

g_t represents a set of yearly time dummies, and

$\varepsilon_{i,t}$ is an error term.

The second model, random effects specification, adds firm random effects (f_i) to Model 1. In the fixed effects specification the firm effects are assumed to be fixed instead of random.

$$\ln q_{i,t} = \beta_0 + \beta_1 * \mathbf{X_i} + \beta_2 * TCGI_{i,t} + f_i + g_t + \varepsilon_{i,t} \quad (2 - RE \ and \ FE)$$

The fixed effects model provides unbiased estimates even if the firm effects are correlated with other variables, but imposes a cost because many aspects of governance are sticky. With fixed effects, we can study only aspects with substantial within-firm time variation. Hence, we consider both RE and FE as useful specifications, with different strengths.

We also employ models in which we replace the *TCGI* with each subindex included separately.

$$\ln q_{i,t} = \beta_0 + \beta_1 * \mathbf{X_i} + \beta_2 * Sub_{i,t}^s + f_i + g_t + \varepsilon_{i,t} \quad (2 - Subindex)$$

where subindices are indexed by superscript *s*:

$Sub_{i,t}^1$ is the Board Structure sub-index of $TCGI_{i,t}$

$Sub_{i,t}^2$ is the Ownership Structure sub-index $TCGI_{i,t}$

$Sub_{i,t}^3$ is the Board Procedure sub-index $TCGI_{i,t}$

$Sub_{i,t}^4$ is the Disclosure sub-index $TCGI_{i,t}$

$Sub_{i,t}^5$ is Minority Shareholder Rights sub-index $TCGI_{i,t}$.

In studies which focus on a single aspect of governance, the coefficient on a subindex using variants of Model (2 - Subindex) can reflect the effect of another omitted subindex and can be a source of omitted variable bias. Therefore, while it is appropriate to use Models 1 and 2 to estimate the relationship between a broad governance index and firm market value, Model (2 - Subindex) can produce biased results if we want to assess which aspects of governance matter. To account for this potential bias, we employ two additional models in which we consider all subindices together

$$ln\ q_{i,t} = \beta_0 + \beta_1 X_i + \sum_{s=1}^{5} \beta_{2,s}\ Sub^{\,s}_{i,t} + f_i + g_t + \varepsilon_{i,t} \quad (3)$$

and a Model 4 which includes both a particular subindex and its complement (the equally weighted average of the other four subindices):

$$ln\ q_{i,t} = \beta_0 + \beta_1 X_i + \beta_2\ Sub^{\,s}_{i,t} + \beta_3\ Sub^{\,s,Comp}_{i,t} + f_i + g_t + \varepsilon_{i,t} \quad (4)$$

where $Sub^{s,comp}_{i,t}$ is the complement of a sub-index $Sub^{s}_{i,t}$.

3.5 CONTROL VARIABLES

Many firm characteristics are potentially associated with both Tobin's q and governance. We therefore include an extensive set of control variables to minimize concerns of omitted variable bias. Table 4 defines the control variables and other non-governance variables we use in this paper, and provides summary statistics.

Our control variables are as follows. *Firm size:* we use *ln*(assets) to control for the effect of firm size on Tobin's q; *Firm age*: the natural logarithm of the number of years since listing on the Istanbul Stock Exchange (relative to the year of observation)[12] as a proxy for firm age, because younger firms are likely to grow fast, which can lead to higher Tobin's q; *Leverage*: leverage is measured as total debt/assets,

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[12] We add 1 to this figure to avoid taking logs of zero (since some firms start listing in 2006 and later.

winsorized at 99%) because leverage can influence Tobin's q by providing tax benefits, affecting bankruptcy risk and reducing free cash flow problems. Leverage is also mechanically related to Tobin's q, since both variables use the same denominator; *Growth prospects and profitability:* Tobin's q is related to a firm's growth prospects and current profitability. We control for growth prospects using three year geometric sales growth and *R&D*/Sales, and for profitability using both net income/assets and *EBIT*/sales; *Capital intensity:* we control for capital intensity using the ratio of property, plant and equipment (*PPE*) to sales (*PPE*/*sales*)and capital expenditures (*Capex*) to *PPE* (*Capex/PPE*); *Liquidity*: we include share turnover (traded shares/total shares) and fraction of freely trading shares (free float) as measures of share liquidity, since share prices may be higher for firms with more liquid shares; *Ownership*: we include the fractional ownership by the largest shareholder and affiliated shareholders, ownership by foreign shareholders and ownership by the state. *MSCI dummy:* membership in the Morgan Stanley Capital International index may proxy for liquidity and foreign investor interest. *Exposure to competition:* Product market competition can potentially substitute for governance in imposing market discipline on managers. We control for two aspects of competition: exports/sales (since export markets are likely to be competitive) and domestic market share in the firm's principal industry.

We also include several variables which drop out in the firm fixed effects specification, but are relevant for OLS and RE specifications. *Industry:* factors such asset structure, accounting practices, government regulation, and industry concentration may vary across industries and affect both governance and firm valuation. To account for these differences, we include a set of industry dummies defined at the 2 digit US SIC level.[13] *Cross-listing dummy:* Since cross-listing may enhance liquidity and foreign investor interest, and may also proxy for otherwise unobserved growth opportunities, we control for these effects by

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[13] We use also employed a "local" set of industry dummies using a broader industry definition provided by the Istanbul Stock Exchange, but chose the set of industry dummies defined at the 2 digit US SIC level due to the its significantly better fit.

including a dummy variable for firms cross-listed in US (any level). *Business group dummy,* because firms that belong to business groups may behave differently and have different financing and other opportunities than stand-alone firms.

4. *TCGI* AND FIRM VALUE

In the next part, we analyze the relationship between the overall governance proxied by *TCGI* and firm value and profitability using alternative specifications and different sets of control variables. We also discuss the robustness of this relationship to the choice of dependent variable and time period.

4.1 THE IMPACT OF OVERALL GOVERNANCE AND FIRM VALUE AND PROFITABILITY

In Table 5 we report the estimated coefficients from FE, RE and OLS regressions of *ln*(Tobin's *q*) (column 1-4), FE and RE repressions of *ln*(*Market/Book*) (column 5 and 6), and *(EBIT/Assets)* (column 7 and 8) on normalized *TCGI.*

We first show in Figure 3 the scatterplot of *ln*(Tobin's *q*) and normalized *TCGI* and also report the estimated coefficient of the corresponding regression line. In the absence of control variables the coefficient on normalized *TCGI* on firm value is 0.043 ($t = 2.95$). When we control, however, for fixed firm and time effects (column 4) the coefficient on normalized *TCGI* increases to 0.092 which is significant at the one percent level.

To ensure the statistical validity of this coefficient estimate, Table 5 reports an alternative *t*-statistics employing a different pattern of mutual dependence in the residuals. The alternative *t*-statistic uses standard errors clustered on business groups treating each business group and each non-group firm as a separate group ("cluster on group or firm"). Doing so assumes that there are group level governance norms, practices and/or behavioral patterns which typically enter panel regressions as unobservable common factors.[14]   With

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[14] Hence, complex forms of spatial and temporal dependence may arise even when the cross-sectional units have been randomly and independently sampled.

the alternative *t*-statistics using standard errors clustered on group or firm, all coefficients on *TCGI* remain significant, the *t*-statistics in the FE specification are slightly smaller than the *t*-statistics using standard errors clustered only on firm, whereas the *t*-statistics are slightly smaller in the RE and OLS specifications.

The relationship between *TCGI* and firm value is sensitive to the set of control variables. In unreported regressions with different sets of control variables, we obtain the following results: controlling only for firm size, firm age, sales growth, *PPE/Sales* and cross-listings in a FE specification produces a coefficient of 0.071 ($t = 2.44$) on *TCGI*. When we further add leverage, income/assets, share turnover, inside ownership and *R&D*/Sales to this equation, we obtain a smaller coefficient on *TCGI* which is marginally significant ($\beta_2 = 0.049, t = 1.81$).

In the RE specification with full controls the coefficient on normalized *TCGI* is slightly higher 0.073 and significant at the one percent level. The Breusch-Pagan tests strongly reject the absence of firm effects and imply that pooled OLS coefficients will be biased. At the same time Hausman tests strongly reject the equivalence of RE and FE models. Thus, if the fixed effects specification is correct, RE results will also be biased. The median λ, indicating whether RE results are closer to pooled OLS (λ = 0) or to FE ((λ = 1) is relatively high (λ=0.717).

With fixed effects (column 2) the coefficient on normalized *TCGI* is close to the RE coefficient and smaller than in the pooled OLS. This weakening likely reflects a combination of bias in RE coefficients and limited within-firm variation. The fixed effects coefficients on normalized *TCGI* suggest economically important effects on firm value; with $\beta_2 = 0.074$ a one-standard-deviation increase in governance predicts a 7.6 increase in Tobin's *q*.

Columns 5 and 6 report FE and RE regressions of *ln*(*Market/Book*) on *TCGI*. With the FE specification we obtain an insignificant coefficient of 0.076 on *TCGI* and with the RE specification the coefficient is 0.077 (significant at the 1% level). *TCGI* captures a coefficient of 0.010 in the FE specification of *(EBIT$_{t+1}$/Assets$_t$)* which is statistically insignificant (*t*=1.74).

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4.2 ROBUSTNESS TO THE CHOICE OF DEPENDENT VARIABLE AND ALTERNATIVE CONSTRUCTION OF *TCGI*

To assess robustness, we estimate several versions of the regressions reported in Table 4.[15] When we, instead of excluding outliers, winsorize *ln*(Tobin's *q*), the results strengthen and work out a $\beta_2 = 0.084$ (*t*=2.67) in the FE specification. When the outliers are neither excluded or winsorized, the coefficient on *TCGI* is slightly above the base results ($\beta_2 = 0.076$, *t*=2.84). When we use Tobin's *q* instead of *ln*(Tobin's *q*), the coefficient in the FE specification is 0.159 and only significant at the 10% level. When we winsorize the control variables (as listed in Table 3), we obtain a slightly higher coefficient of 0.76 (*t*=3.23) and when we use one-year lagged control variables the coefficient on *TCGI* increases to 0.084 (*t*=2.32).

When we repeat the same robustness checks with *ln*(Market/Book) and *ln*(Market/Sales), we obtain higher coefficients on *TCGI* in OLS, RE and FE specificactions which are significant at 1% or 5% levels. When we use (*EBIT/Assets*)*ₜ₊₁* as the dependent variable, we obtain significant coefficients on *TCGI* in the OLS and RE specifications, the FE coefficient is insignificant at conventional levels.

How one defines and treats potentially influential observations makes sometimes an economically and statistically significant difference, it does not, however, change our base result that there is a strongly significant effect of governance on firm value.

4.3 SUBINDEX RESULTS

In this section we examine which aspects of governance are associated with higher firm value. We quantify the effects of the five subindices of *TCGI* on firm value (proxied by *ln*(Tobin's *q*) and ln(Market/Book)) and *EBIT/Assets*. As we noted before (see also the correlations in Panel B of Table 2), the subindices are correlated with each other. Therefore, separate estimates of their effect on firm value are likely to be biased due to omitting other aspects of governance. To address this bias, we use two different procedures, reported Table 6. Column 1 presents a firm FE regression based on Model 3, but including all

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[15] The results described in this section are reported in Table 2 of the Appendix.

subindices together in a single regression. Columns 3 and 4 report firm RE and pooled OLS specifications of the same model. In column 2 we present the coefficient estimates from ten regressions based on Model 4 above, each reporting the coefficient on the subindex and its complement.

When all five subindices are estimated together in a single regression, we observe that the Disclosure subindicex is significant at the 1% level in the FE and RE specifications (column 1 and 3). In the OLS specification the also the Shareholder Rights subindex is significant along with the Disclosure subindex (0.060, $t = 2.89$).

In column 2 we present the coefficient estimates from Model 4 by reporting the coefficients on each subindex and its complement using the FE specification. Again, the Disclosure subindex is the only significant aspect of governance in the presence of its subindex complement. On the other hand, the regressions with the subindex and subindex complement indicate that with the exception of the subindex complements of the Disclosure subindex, all other subindex complements turn out to be significant predictors of Tobin's q and whereas the subindex itself remains insignificant.

We also estimate OLS, RE and FE regressions in which *TCGI* is replaced by the factors retained in the principal components analysis described in section 3.3[16]. When we employ all of the 14 factors retained in the PCA based on the governance elements, we obtain significantly positive coeffcents on four of them in the FE specification. The linear combination of the first three factors works out a total effect of 0.163 which is highly significant (t-value = 4.28). When we use only the first three factors instead of the all 14, the linear combination of them is equal to 0.132 (t=4.35). The PCA at the subindex level produces two factors with eigenvalues greater than 1.0 of which only the first factor captures a significant coefficient of 0.055 in the FE specification.

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[16] These results are reported in Table 3 of the Appendix.

These results highlight that we need to use an overall, broadly defined index to assess the importance of governance, and to control for the rest of the overall index when assessing a particular aspect of governance. Studies which focus on a particular aspect of governance may find a positive association between this aspect and firm value (e.g., board independence and firm market value), but they do not control for other aspects of corporate governance. If this particular aspect of governance is correlated with the rest of an overall index, the rest of the index becomes an omitted variable. Our results in Table 5 suggest that the omitted variables can be a serious source of bias in single-aspect governance studies.

5. WHAT ASPECTS OF GOVERNANCE MATTER IN TURKEY?

In this section, we analyze the effects of business groups on the market valuation and profitability of their affiliated companies in part 5.1, and study the relationship between group level governance and group value in part 5.2.

5.1 BUSINESS GROUPS

Governance choices of firms affiliated with a business group can be different from stand-alone firms (Masulis, Pham and Zein, 2011). It is also possible that firms affiliated with a particular business group (BG) have similar governance choices that are diferent from the choices of firms affiliated to other BGs. To account for these potential differences, we identify 18 business groups with two or more listed companies in our dataset. These belong to the largest business groups operating in Turkey.

To show the importance of the groups, Table 7 reports the estimates our basic models after replacing the firm fixed effects with group fixed effects for the same dependent variables as in Table 4. For each dependent variable, we present results which include or exclude firm random effects. The odd-numbered columns report results with *TCGI* and the even-numbered columns repeat the same exercise after replacing *TCGI* by its five subindices. All equations include the full set of control variables which are suppressed to save space.

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The coefficient estimates on *TCGI* are in the same order of magnitude as the RE and pooled OLS coefficients reported in Table 4 and they are significant for *ln*(Tobin's *q*), *ln*(Market/Book), and EBIT$_{t+1}$ / Assets$_t$. We compute the *t*-statistics using standard errors clustered at the business group level. When we replace *TCGI* by its subindices, we observe that similar to results in Table 6, the Disclosure subindex is the driving component of *TCGI* in the specification with firm random effects. When firm random effects are dropped, we also observe that the Shareholder Rights subindex is positively associated with firm value (Column 4 and 8). Ten of the estimated coefficients on business group dummies in the Tobin's *q* equations are significantly different from zero and five of them have a negative sign. The dummies for Anadolu, Akfen, Cukurova, Koc and Oyak groups are positive suggesting that the average group company belonging to these groups has a significantly higher market valuation than the companies that are part of other groups and non-group firms. The magitudes of the group dummies range from -0.290 to 0.457 and hence suggest that group identity substantially affects firm value; after having controlled for an extensive set of firm characteristics and firm governance, group identity can add as much as 58 percent to firm value (e$^{0.457}$=1.58). Companies that are part of the Akkök, Dogus, Eczacibasi, Ihlas, and Zorlu groups, on the other hand, have significantly lower market valuations. We observe a simiar pattern when we replace *ln*(Tobin's *q*) with *ln*(Market/Book) as the dependent variable.

With EBIT$_{t+1}$ / Assets$_t$ as the dependent variable and with firm random effects, we note that 12 of the group dummies pick up significant coefficients. Four of these groups (Akkök, Dogus, Koc and Dogus) have significantly higher profitability than other groups and non-group firms and eight groups have significantly lower profitability. The coefficients on significant group dummies range from -0.058 to 0.076 suggesting that group identity has an economically important effect on the profitability of affiliated firms.

The results suggest that business groups have economically important effects on the market valuation and profitability of their affiliated companies. This effect varies across groups and is unlikely to be captured with a simple business group dummy.

One major obstacle to analyze the behavior and effects of business groups is the fact that official data are collected and reported at the company instead of the group level. Such reporting practices put a severe limitation on data availability at the business group level. In this part, we extend the analysis to the business group level in that we assemble additional information on time-varying characteristics of business groups. We collect data reported at the group level[17] on the following characteristics: total assets of the group, group profitability (EBIT/Assets), growth rate of assets, group age (number of years from the foundation of the parent holding company). We also collect information on the presence of a group bank, whether the founder is alive, and whether the group has a listed parent company. We define group governance as the mean normalized *TCGI* of the affiliated companies for each group in our sample.

Figure 4 shows the scatterplot pooled across years of mean group *TCGI* on *ln*(group age), and corresponding regression line using a sample of 125 group-year observations (18 groups; based on 332 firm-year observations). The coefficient on ln(group age) is -0.99 ($t = -1.65$ with group clusters and $t = -3.34$ with firm clusters) suggesting a negative relationship between group age and the average governance quality of the group.

Table 8 reports coefficients for group fixed effects, group random effects, and pooled OLS regressions of group-level *ln*(Tobin's *q*) on normalized group-level *TCGI* and subindices. All equations include group-level control variables; *ln*(group total assets), group profitability, one-year asset growth rate, dummy for presence of a group bank, *ln*(group age), dummy for group where founder is alive, dummy for group with listed parent company, and year dummies). To save space, we suppress the coefficients of these

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[17] Most business groups with a listed parent holding company provide group level information in their annual reports. However, groups with non-listed parent company are opaque. In such cases, we consult the webpages of the business group,and use several auxiliary data sources including CSR reports, press releases, and interviews with the controlling family members.

group-level control variables. In regressions (1)-(2) firm-level Tobin's q's are equally weighted within each group; in regressions (3)-(8), they are weighted by assets. Number of observations (groups) is 105 (18).

The normalized group-level *TCGI* strongly predicts group-level Tobin's q both when group q is equally weighted (coefficient = 0.187, t = 2.29, clustered on group) or when we use a group level q weighted by the assets of group firms (coefficient = 0.302, t = 2.34). When the subindices are used instead of *TCGI*, we observe that the ownership structure subindex and the board procedures subindex are significant predictors of group level q in the FE specification (equal weighting, column 2). When we use the group level q weighted by the assets of group firms, the ownership structure subindex and the disclosure subindex are highly significant in predicting group level q. The results weaken somewhat when we switch to a RE specification; *TCGI* captures now an insignificantly positive coefficient of 0.101 (t = 1.39), the ownership structure subindex and board procedures subindex continue to capture significantly positive coefficients in the order of the same magnitude as in the FE specification. In the pooled OLS specification the *TCGI* is insignificantly positive, but the ownership structure subindex remains significant. Compared to firm level regressions, the board procedures subindex has additional explanatory power highlighting the importance of governance elements related to boards in group firms.

6. CONCLUSIONS

We contribute to the literature on corporate governance indices and the link between governance and firm value. We survey the corporate governance practices of listed firms over 2006–2012 in Turkey and construct a corporate governance index. We use this index, *TCGI*, and its subindices to study the relationship between firm-level governance and their market valuations using OLS, firm random and fixed effects specifications. At the firm-level, the results from our preferred model which includes an extensive set of control variables suggest that a one-standard-deviation increase in governance predicts a 7.5 - 9.5 percent increase in Tobin's q. The most important component of *TCGI* is its Disclosure subindex, whereas other aspects of governance contribute less to nothing in predicting Tobin's q.

We also extend this analysis to uncover the relationship between group governance and group value. We document important differences across the business groups and show that affiliated firms have less variation in governance structures and practices within a group relative to the variation in the whole sample. At the business group-level, we find two important results. First, we report that business group identity has an economically and statistically important effect on market valuations of affiliated companies. This effect is heterogenous and our estimates suggest that group identity's influence on firm values ranges from a negative 26 percent to almost 60 percent. Second, using a group level governance measure and controlling for group characteristics, we find that group governance has a positive effect on the group value. Also, this effect is sizeable and can contribute as much as 20 to 35 percent of group value.

Similar to prior research that different firms and different countries might need different governance, our results suggest that different types of groups might require different governance structures and practices. Some of our results suggest that group governance characteristics may be indicative of the quality and nature of control exercised by the controlling shareholders.

Given the lack of comparable research, the extent to which our results will generalize beyond Turkey is uncertain. Further research is needed about how to operationalize group governance and how group governance indicators predict group and affiliated firm value. Understanding investors' heuristics about how business group identity is factored in investment decisons may be useful to this end.

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Table 1. Major Business Groups in Turkey

This table provides summary in formation for the 18 major Turkish business groups. Data is as of 2011. Number of pyramid levels is based on maximum number of levels, based on ownership of public firms only. Group level data come from consolidated financial statements of the parent holding companies. Amounts in Mn. TL.

Group Name	Controller	Founded	No of Public Companies	Public Holding	Group Bank	Pyramid Levels	Assets	Sales	Employees
Anadolu	Yazıcı &Özilhan Families	1949	4	1	1	4	3,795	841	23,000
Akfen	Akin Family	1976	2	1			2,431	664	24,355
Akkök	Dinckök Family	1952	4			4	5,439	1,354	26,082
Alarko	Alaton & Garih Families	1951	2	1		1	1,039	878	6,537
Borusan	Kocabıyık Family	1944	2	1		2	2,341	3,144	5,200
Cukurova	Karamehmet Family	1935	2		1	3	11,492	7,823	36,300
Dogan	Dogan Family	1961	6	1		4	5,352	5,049	12,428
Dogus	Dogus Family	1951	3		1	3	24,860	4,862	27,000
Eczacibasi	Eczacibasi Family	1942	5	1		3	5,108	2,554	9,608
Enka	Tara & Gülcelik Families	1957	3	1		2	14,091	8,415	7,861
Ihlas	Ören Family	1970	6	1		2	807	340	2,624
Is Bank	Isbank's own pension fund	1924	9		1	4	71,900	n.a.	21,365
Koc	Koc Family	1926	12	1	1	4	47,102	36,599	81,746
Oyak	Turkish Armed Forces (assistance and pension fund)	1961	8		1	2	20,220	14,061	30,302
Sabanci	Sabanci Family	1943	10	1	1	3	69,930	12,946	54,426
Yasar	Yasar Family	1945	8			2	3,095	1,604	6,583
Yildiz	Ülker Family	1944	3		1	2	13,252	6,866	27,500
Zorlu	Zorlu Family	1953	3			3	9,408	4,874	25,000

Table 2. Construction of *TCGI*, 2006-2012

This table shows the governance elements used to construct Turkey Corporate Governance Index (*TCGI)*, the number of firm-year observations and the mean for each, and the minimum and maximum values for non-binary variables.   Data are hand-collected from firm-level corporate governance compliance reports, articles of association, websites of companies, and from the footnotes to the financial statements. We extrapolate for missing elements as follows: if an element is available in year *t*, but not in year *t*+1 (*t*-1), we extrapolate year *t* value to year *t*+1 (*t*-1). We interpolate for missing elements as follows: if an element is available in years *t* and *t*+2, but not year *t*+1, we use in year *t*+1 the average of the *t* and *t*+2 values.

	N	Mean	Min	Max
Board Structure				
There is at least one independent director	1252	0.34	0	1
There is more than one independent director	1252	0.29	0	1
Audit committee has non-executive or independent chair	1242	0.60	0	1
Audit committee has an independent member	1246	0.26	0	1
CEO (if on board) and chairman are different people	1243	0.82	0	1
Corporate governance committee exists	1256	0.4	0	1
CEO (General Manager) on the board	1251	0.58	0	1
Is the CEO (General Manager) an outsider	1189	0.54	0	1
Normalized Board structure subindex: Turkey	1259	0.00	-1.94	2.10
Scaled Board structure subindex: Turkey	1259	47.86	0.00	100.00
Cronbach's alpha	0.63			
Board Procedures				
Firm has a code of ethics or conduct	1253	0.63	0	1
Corporate governance policy or board charter governs the board process	1254	0.20	0	1
Firm discloses the membership of audit committee	1257	0.74	0	1
Firm discloses audit committee charter	1250	0.19	0	1
Firm has an internal audit function	1256	0.67	0	1
Normalized Board Procedures subindex: Turkey	1258	0.00	-1.80	1.85
Scaled Board Procedures subindex: Turkey	1258	48.77	0.00	100.00
Cronbach's alpha	0.61			
Disclosure				
Firm puts annual financial statements on the Web	1257	0.32	0	1
Firm puts quarterly financial statements on the Web	1257	0.3	0	1
Firm discloses material events on the Web	1257	0.27	0	1
Firm puts annual report on the Web	1257	0.31	0	1
Firm puts CG compliance report separately on the Web	1257	0.26	0	1
Firm puts annual agenda of corporate events on the Web	1257	0.10	0	1
Firm articles of association available on the Web	1257	0.30	0	1
Firms includes shareholding voting information on the Web	1257	0.25	0	1
Firm prepares english language financial statements	1257	0.20	0	1
Firm discloses the list of insiders	1257	0.23	0	1

Shareholding by individual directors	1257	0.38	0	1
If more than 1 class, voting and other rights disclosed	1257	0.18	0	1
Ultimate controlling shareholder disclosed	1257	0.31	0	1
CG charter or guidelines disclosed	1257	0.08	0	1
Code of conduct or ethics code disclosed	1257	0.16	0	1
Information on the last AGM disclosed	1257	0.32	0	1
Board members current roles are disclosed	1257	0.18	0	1
Board members background (education, employment history) is disclosed	1257	0.16	0	1
Board members date of joining the board disclosed	1257	0.18	0	1
Background of senior managers is disclosed	1257	0.11	0	1
Information on internal audit/control is disclosed	1257	0.15	0	1
Number of meetings/year is disclosed	1257	0.26	0	1
Board resolutions are disclosed	1257	0.05	0	1
Executive directors numeration policy is disclosed	1257	0.26	0	1
Normalized Disclosure subindex: Turkey	1259	0.00	-2.64	1.79
Scaled Disclosure subindex: Turkey	1259	60.54	0.00	100.00
Cronbach's alpha	0.86			
Ownership Structure				
1- (frac.of control rights - frac. of cash flow rights)	1257	0.90	0.14	1
Fractional ownership by control group	1257	0.56	0	0.99
One or more class of shares has special nomination rights	1257	0.45	0	1
Firm has class of shares with multiple voting rights	1256	0.18	0	1
Firm has an outside block holder with more than 5% of shares	1249	0.09	0	1
Firm has no founder shares with cash flow rights	1253	0.86	0	1
Normalized Ownership Structure subindex: Turkey	1258	0.00	-2.33	2.90
Scaled Ownership Structure subindex: Turkey	1258	42.16	0.00	94.70
Cronbach's alpha	0.40			
Shareholder Rights				
Directors serve 1 year terms	1242	0.27	0	1
Firm has insider trading policy	1254	0.18	0	1
Firm does not have loans to directors or has a policy limiting these loans	1252	0.20	0	1
Firm has investor relations department	1253	0.72	0	1
Normalized Shareholder rights subindex: Turkey	1258	0.00	-1.66	3.18
Scaled Shareholder rights subindex: Turkey	1258	34.34	0.00	100.00
Cronbach's alpha	0.42			
Normalized *TCGI*	1258	0.00	-2.49	2.25
Scaled *TCGI*	1258	46.73	10.22	82.97
Cronbach's alpha	0.88			

Table 3. Summary Statistics for *TCGI* and its Subindices

Panel A This table presents number of observations, sample mean, and other statistics for *TCGI* (scaled to run from 0~100) by year, prior to normalizing.

Year	Obs.	Mean	Median	Std. Dev.	Min	Max
2006	172	42.97	41.64	13.3	14.04	79.29
2007	175	44.18	42.57	13.33	15.67	79.29
2008	168	45.32	43.54	13.76	15.67	79.29
2009	183	41.67	40.04	12.41	10.22	73.4
2010	192	45.12	45.29	12.99	11.61	78.22
2011	193	46.6	46.75	13.27	14.33	78.22
2012	175	61.55	62.56	10.92	25.43	82.97
Overall	1,258	46.73	45.94	14.25	10.22	82.97

Panel B Pearson correlation coefficients for normalized *TCGI*, its normalized subindices, and "subindex complements" (for each subindex, the complement is *TCGI* – that subindex). Significant correlations (at 5% or better) are in **bold**.

	BS	OWN	BP	DIS	SR
TCGI	**0.66**	**0.19**	**0.73**	**0.93**	**0.35**
Subindex complement	**0.46**	0.07	**0.62**	**0.58**	**0.24**
Board Structure Index (BS)	1.00	0.00	**0.43**	**0.44**	**0.12**
Ownership Structure Index (OWN)		1.00	**0.06**	**0.07**	**0.07**
Board Procedure Index (BP)			1.00	**0.59**	**0.26**
Disclosure Index (DIS)				1.00	**0.22**
Minority Shareholder Rights Index (SR)					1.00

Table 4. Non-governance Variables

Definition and summary statistics for the dependent and independent variables used in this paper. Firms with missing data for R&D/sales and exports/sales are assumed to have 0 values. In some specifications, we winsorize selected variables; the Winsor Min and Winsor Max columns report the winsorization levels.

Variables	Definitions	Mean	Std.Dev.	Min	Max	Winsor Min	Winsor Max
Tobin's q	[(Book value of debt + preferred stock) + market value of common stock]/[book value of total assets]	1.87	11.10	0.20	372.25		13.46
ln(years listed)	Natural logarithm of (number of years since original listing on BIST+ 1)	2.57	0.63	0.00	3.30		
Ln(assets)	Natural logarithm of total assets.	19.65	1.76	15.46	25.87		
Leverage	Book value of total debt / Book value of total assets, winsorized at 99%.	0.50	0.41	0.00	5.98		3.08
Sales Growth	Three year geometric growth rate of sales (use two-year growth if three year growth is missing, and one year growth if two-year growth is missing), winsorized at 1%/99%.	0.02	0.20	-0.69	1.80	-0.61	0.81
R&D/Sales	Ratio of research and development (R&D) expense to sales.	0.01	0.03	0.00	0.10		0.63
Exports/Sales	Ratio of export revenue to sales.	0.21	0.23	0.00	1.11		0.78
PPE/Sales	Ratio of property, plant, and equipment to sales, winsorized at 99%.	0.58	1.15	0.00	14.45		9.82
Capex/PPE	Ratio of capital expenditures to PPE, winsorized at 99%.	0.20	0.28	0.00	55.66		2.24
EBIT/Sales	Ratio of earnings before interest and taxes to sales, winsorized at 1%/99%.	0.05	0.21	-2.26	95.11	-0.94	0.83
Income/Assets	Income / Book value of total assets, winsorized at 99%.	0.03	0.10	-0.41	0.33		
Market Share	Total sales of firm i in industry j / Σ(sales) for all public firms in industry j	0.18	0.27	0.00	1.00		
Share Turnover	Annual share turnover as % of outstanding common shares, winsorized at 99%.	0.60	1.46	0.00	19.68		2.58
Free Float	Common shares in the free float / common shares outstanding	0.38	0.22	0.02	1.00		
Inside Ownership	Fractional ownership of common (and equivalent) shares by largest shareholder	0.49	0.21	0.00	0.99		
Foreign Ownership	Fractional ownership by foreign entities	0.02	0.08	0.00	0.50		
State Ownership	Fractional ownership by the state	0.00	0.03	0.00	0.49		
Business Group	1 if company is a member of a business group, 0 otherwise.	0.41	0.49	0.00	1.00		
Cross Listing Dummy	1 if firm shares are cross-listed on a foreign exchange at the end of year t	0.08	0.27	0.00	1.00		
MSCI Index Dummy	1 if firm is in Morgan Stanley Capital International Emerging Markets Index; 0 otherwise.	0.09	0.29	0.00	1.00		

Table 5. *TCGI* and Firm Market Value

Firm fixed effects (FE), firm random effects (RE) and pooled OLS regressions of indicated dependent variables on normalized *TCGI*. All equations include year dummies and industry dummies (dropped for FE). We exclude outliers for which a studentized residual from regressing dependent variable on *TCGI* (year-by-year) > |1.96|. In columns 7 and 8 the dependent variable is (EBIT$_{t+1}$/Assets$_t$) (thus, *TCGI* and controls are lagged one year). R^2 is adjusted R^2 for OLS; within R^2 for FE and overall R^2 for RE. *t*-values (in parentheses) for *TCGI* use, in alternative, clustering on firm, on group (non-group firms treated as single group, 21 total groups), and on group or firm (separate cluster for each non-group firm). *t*-values for covariates use firm clusters*, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively (suppressed for constant term). For RE, p-values for Breusch-Pagan test for presence of firm effects and Hausman test for differences in coefficients between RE and FE are p = 0.000; table shows median random effects λ. Significant results (at 5% level or better) are in **boldface**.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Variable		*ln*(Tobin's *q*)			*ln*(Market/Book)		EBIT$_{t+1}$/Assets$_t$	
	FE	FE	RE	OLS	FE	RE	FE	RE
TCGI	0.038*	**0.074*****	**0.073*****	**0.092*****	**0.076*****	**0.077*****	0.010*	**0.011****
cluster on firm	(1.68)	**(3.06)**	**(3.28)**	**(3.69)**	**(2.89)**	**(3.01)**	(1.74)	**(2.37)**
cluster on group	(1.72)	**(3.20)**	**(3.33)**	**(3.48)**	**(2.89)**	**(2.93)**	(1.58)	**(2.13)**
cluster on group or firm	**(2.20)**	**(3.89)**	**(4.18)**	**(5.00)**	**(4.19)**	**(4.18)**	(1.86)	**(2.74)**
ln(Assets)		-0.215***	-0.123***	-0.096***	-0.255***	-0.151***	-0.019*	0.003
		(-4.54)	(-5.67)	(-4.29)	(-4.77)	(-5.82)	(-1.72)	(0.69)
ln(Years Listed)		-0.113**	-0.051	0.017	**-0.204*****	**-0.119****	0.016	**0.013****
		(-2.09)	(-1.28)	(0.38)	**(-2.78)**	**(-2.33)**	(1.45)	**(1.99)**
Sales Growth		**0.177****	**0.172****	**0.194****	0.144	0.144	0.026*	**0.032****
		(2.18)	**(2.18)**	**(2.10)**	(1.11)	(1.17)	(1.72)	**(2.35)**
PPE/Sales		0.018	0.012	-0.005	0.006	0.004	-0.002	-0.003
		(1.44)	(1.47)	(-0.45)	(0.60)	(0.53)	(-1.64)	(-1.59)
Cross Listing Dummy		-0.030	-0.017	0.012	-0.094	-0.079	0.002	0.001
		(-0.72)	(-0.43)	(0.23)	(-1.57)	(-1.33)	(0.34)	(0.08)
Leverage		**0.806*****	**0.697*****	**0.763*****	**1.250*****	**1.081*****	0.001	-0.007
		(5.59)	**(6.64)**	**(7.70)**	**(6.62)**	**(7.37)**	(0.04)	(-0.76)
Income/Assets		**0.366*****	**0.451*****	**1.076*****	**0.697*****	**0.820*****		
		(2.61)	**(3.38)**	**(4.89)**	**(3.31)**	**(4.14)**		
Share Turnover		0.016*	0.012	0.004	0.011	0.009	-0.002	-0.005
		(1.73)	(1.12)	(0.20)	(0.91)	(0.69)	(-0.82)	(-1.55)
Inside Ownership		0.346	0.219	0.087	0.020	0.246	0.130*	-0.000
		(1.13)	(1.28)	(0.63)	(0.05)	(1.24)	(1.76)	(-0.01)
R&D/Sales		-3.950*	**-4.065****	-2.786	-4.309*	**-4.467****	0.143	0.624
		(-1.96)	**(-2.45)**	(-1.37)	(-1.85)	**(-2.23)**	(0.36)	(1.58)
Foreign Ownership		**-0.705*****	**-0.576*****	0.023	**-0.516****	-0.389*	0.003	0.024
		(-2.96)	**(-2.64)**	(0.11)	**(-2.09)**	(-1.68)	(0.10)	(0.95)
State Ownership		**0.733*****	**0.426****	-0.076	**1.346*****	**0.925*****	**-0.088*****	**-0.110*****
		(7.38)	**(2.36)**	(-0.24)	**(12.56)**	**(3.49)**	**(-4.99)**	**(-3.81)**
Free Float		-0.001	-0.002	-0.004	0.001	-0.001	0.048**	-0.007
		(-0.77)	(-1.43)	(-1.54)	(0.49)	(-0.66)	(2.45)	(-0.46)
EBIT/Sales		-0.053	-0.017	0.008	-0.050	-0.009		
		(-0.63)	(-1.34)	(0.50)	(-0.44)	(-0.79)		
Capex/PPE		0.002	**0.004****	**0.007*****	**0.011*****	**0.013*****	0.000	-0.001
		(0.66)	**(2.33)**	**(2.91)**	**(2.79)**	**(3.72)**	(0.08)	(-0.23)
Exports/Sales		-0.048	-0.039	-0.079	0.010	0.011	-0.027	-0.002
		(-0.39)	(-0.34)	(-0.79)	(0.07)	(0.08)	(-0.90)	(-0.08)
Market Share		**0.758*****	**0.444*****	-0.084	**0.862*****	**0.448****	0.013	0.013
		(3.69)	**(2.95)**	(-0.63)	**(3.61)**	**(2.49)**	(0.16)	(0.35)
Business Group			0.089	0.051		0.137*		-0.013
			(1.44)	(0.92)		(1.75)		(-1.48)
MSCI		-0.070*	0.090	**0.259*****	-0.133*	0.014	0.018	**0.029*****
		(-1.73)	(1.16)	**(2.69)**	(-1.96)	(0.16)	(1.19)	**(2.72)**
Observations	1,204	1,126	1,126	1,126	1,089	1,089	924	924
Firms	225	196	196	196	192	192	190	190
Median RE λ			0.717			0.712		0.595
R^2	0.368	0.482	0.395	0.436	0.546	0.464	0.0708	0.412

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Table 6. Sub-indices of *TCGI* and Firm Value

Table shows coefficients for firm fixed effects, firm random effects and pooled OLS regressions of *ln*(Tobin's *q*) on normalized sub-indices of *TCGI* and control variables for 2006-2011. Control variables are same as in Table 4, eqn. 4; coefficients are suppressed. Observations are identified as outliers if studentized residual from regressing *ln*(Tobin's *q*) on *TCGI* **>** ±1.96. Regression (1, 3 and 4): All subindices included together in a single regression (replacing *TCGI*). Regressions in column (2): Each subindex included together with Reduced *TCGI* (*TCGI* – indicated subindex). Number of observations (firms) is 978 (194) in OLS and RE specifications and 970 (190) with FE) *t*-statistics (with standard errors clustered on firm) are in parentheses. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. R^2 is adjusted R^2 for OLS; within R^2 for FE and overall R^2 for RE. Significant results (at 5% level or better) are in **boldface**.

	(1)	(2)		(3)	(4)
Dependent Variable			*ln*(Tobin's *q*)		
NormalizedSubindex included	**Together**	**Subindex**	**Reduced TCGI**	**Together**	**Together**
	Fixed Effects	**Fixed Effects**		**Random Effects**	**Pooled OLS**
Board Structure	0.021	0.017	**0.063***	0.010	0.007
	(1.09)	(0.91)	**(2.67)**	(0.56)	(0.29)
Ownership Structure	0.054*	0.052*	**0.070***	0.009	-0.008
	(1.71)	(1.67)	**(3.05)**	(0.44)	(-0.38)
Board Procedures	-0.006	-0.006	**0.079***	-0.003	0.005
	(-0.31)	(-0.33)	**(3.47)**	(-0.17)	(0.20)
Disclosure	**0.064***	**0.058**	0.025	**0.069***	**0.068***
	(2.77)	**(2.54)**	(1.08)	**(3.35)**	**(2.84)**
Shareholder Rights	0.009	0.006	**0.072***	0.015	**0.060***
	(0.58)	(0.35)	**(3.27)**	(0.97)	**(2.89)**
control variables, constant	yes	yes		yes	yes
R^2 [Range]	0.49	[0.47 – 0.48]		0.40	0.44

Table 7. Business Groups, Firm Value and *TCGI*

Table reports coefficients for group fixed effects regressions, with and without firm random effects, of ln(Tobin's q), ln(Market/Book) and (EBIT$_{t+1}$/Assets$_t$) on normalized *TCGI* (odd-numbered regressions) and subindices of *TCGI* (even-numbered regressions), control variables (coefficients suppressed; variables are same as Table 4, regression (4)). Observations are identified as outliers if studentized residual from regressing dependent variable on *TCGI* (year-by-year) > ±1.96. R^2 is adjusted R^2 for OLS and overall R^2 for RE. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. *t*-values (in parentheses) use business group clusters. Significant results (at 5% level or better) are shown in **boldface**.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent Variable	ln(Tobin's q)				ln(Market/Book)				EBIT$_{t+1}$ / Assets$_t$			
Firm Random Effects	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No
TCGI	**0.075*****		**0.098*****		**0.111*****		**0.124*****		**0.010****		**0.010****	
	(4.27)		**(7.20)**		**(6.53)**		**(6.34)**		**(2.32)**		**(2.25)**	
Board Structure		0.013		**0.026****		0.014		0.008		-0.001		-0.003
		(1.26)		**(2.56)**		(0.53)		(0.33)		(-0.25)		(-0.75)
Ownership Structure		0.008		-0.016		0.010		-0.023		0.000		-0.002
		(0.58)		(-1.29)		(0.51)		(-1.32)		(0.06)		(-0.42)
Board Procedures		-0.004		0.007		-0.006		0.005		-0.001		-0.002
		(-0.25)		(0.41)		(-0.28)		(0.23)		(-0.68)		(-0.95)
Disclosure		**0.066*****		**0.061*****		**0.100*****		**0.089*****		**0.014*****		**0.014*****
		(3.94)		**(3.32)**		**(7.10)**		**(3.57)**		**(3.31)**		**(3.58)**
Shareholder Rights		0.014		**0.053*****		0.027*		**0.078*****		-0.004		-0.001
		(1.32)		**(3.50)**		(1.95)		**(3.07)**		(-1.26)		(-0.49)
control vars.,constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Anadolu (4)	**0.380*****	**0.373*****	**0.276*****	**0.272*****	**0.474*****	**0.464*****	**0.372*****	**0.364*****	0.007	0.003	0.004	-0.001
	(5.09)	**(4.82)**	**(3.39)**	**(3.50)**	**(3.93)**	**(3.62)**	**(2.95)**	**(2.91)**	(0.68)	(0.26)	(0.34)	(-0.08)
Akfen (2)	**0.457*****	**0.476*****	**0.395*****	**0.373*****	**0.898*****	**0.939*****	**0.943*****	**0.951*****	0.017*	0.022	0.008	0.011
	(3.83)	**(3.94)**	**(3.88)**	**(3.78)**	**(6.24)**	**(5.80)**	**(5.75)**	**(5.66)**	(1.67)	(1.13)	(0.75)	(0.64)
Akkök (6)	**-0.084****	-0.075*	-0.074	**-0.098****	-0.174**	-0.159**	-0.107	-0.135	**0.016****	**0.020****	0.014	**0.016****
	(-1.97)	(-1.74)	(-1.54)	**(-2.24)**	(-2.10)	(-2.03)	(-1.14)	(-1.57)	**(2.02)**	**(2.27)**	(1.65)	**(2.22)**
Alarko (2)	0.088	0.083	-0.082	-0.083	0.122*	0.114*	-0.069	-0.070	**-0.043*****	**-0.044****	**-0.051*****	**-0.051*****
	(1.46)	(1.39)	(-1.46)	(-1.57)	(1.92)	(1.81)	(-1.02)	(-1.15)	**(-2.77)**	**(-2.47)**	**(-3.64)**	**(-3.19)**
Borusan (2)	-0.007	-0.015	-0.003	0.035	-0.060	-0.072	-0.009	0.031	**-0.035*****	**-0.034*****	**-0.036*****	**-0.033*****
	(-0.12)	(-0.23)	(-0.07)	(0.88)	(-0.85)	(-0.90)	(-0.13)	(0.52)	**(-4.03)**	**(-2.97)**	**(-3.72)**	**(-3.31)**
Cukurova (2)	**0.299*****	**0.300*****	**0.188****	**0.186****	**0.371*****	**0.376*****	0.148	0.167	**-0.058*****	**-0.051*****	**-0.055*****	**-0.045*****
	(4.28)	**(4.16)**	**(2.68)**	**(2.67)**	**(4.23)**	**(4.14)**	(1.33)	(1.67)	**(-3.26)**	**(-3.06)**	**(-3.73)**	**(-3.20)**
Dogan (6)	0.005	-0.000	0.034	0.003	-0.057	-0.069	-0.003	-0.049	**-0.046*****	**-0.046*****	**-0.039*****	**-0.041*****

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	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent Variable	*ln*(Tobin's *q*)				*ln*(Market/Book)				EBIT$_{t+1}$ / Assets$_t$			
Firm Random Effects	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No
	(0.21)	(-0.00)	(0.81)	(0.07)	(-1.46)	(-1.56)	(-0.05)	(-0.70)	**(-9.24)**	**(-5.61)**	**(-6.82)**	**(-5.05)**
Dogus (3)	**-0.290*****	**-0.270*****	**-0.220****	**-0.236*****	-0.135	-0.108	-0.081	-0.108	**0.076*****	**0.088*****	**0.082*****	**0.092*****
	(-4.36)	**(-4.29)**	**(-2.54)**	**(-3.09)**	(-1.19)	(-1.20)	(-0.57)	(-0.95)	**(6.56)**	**(6.26)**	**(6.54)**	**(6.53)**
Eczacibasi (5)	**-0.228*****	**-0.228*****	**-0.192*****	**-0.201*****	-0.082*	-0.082*	-0.068	-0.076	**-0.057*****	**-0.060*****	**-0.053*****	**-0.056*****
	(-5.58)	**(-5.24)**	**(-4.39)**	**(-4.77)**	(-1.91)	(-1.80)	(-1.26)	(-1.40)	**(-6.35)**	**(-7.54)**	**(-5.95)**	**(-6.48)**
Ihlas (6)	**-0.256*****	**-0.244*****	**-0.332*****	**-0.306*****	**-0.324*****	**-0.296*****	**-0.416*****	**-0.345*****	**-0.037*****	**-0.035*****	**-0.032*****	-0.022*
	(-4.17)	**(-4.03)**	**(-4.01)**	**(-4.19)**	**(-3.42)**	**(-3.44)**	**(-3.43)**	**(-3.26)**	**(-3.52)**	**(-3.17)**	**(-3.20)**	(-2.01)
Is Bank (9)	-0.091	-0.102	**-0.181*****	**-0.187****	**-0.122**	**-0.141****	**-0.243*****	**-0.263*****	**-0.025****	**-0.031*****	**-0.029*****	**-0.036*****
	(-1.47)	(-1.64)	**(-2.90)**	**(-2.68)**	**(-1.58)**	**(-2.12)**	**(-3.11)**	**(-3.18)**	**(-2.46)**	**(-3.19)**	**(-2.87)**	**(-4.04)**
Koc (12)	**0.358*****	**0.340*****	**0.195*****	**0.166*****	**0.447*****	**0.416*****	**0.245*****	**0.194****	**0.033*****	**0.031*****	**0.028*****	**0.024*****
	(5.55)	**(4.96)**	**(4.04)**	**(3.46)**	**(5.07)**	**(4.11)**	**(3.30)**	**(2.35)**	**(4.70)**	**(3.78)**	**(4.85)**	**(3.97)**
Oyak (8)	**0.263*****	**0.269*****	**0.163*****	**0.158*****	**0.286*****	**0.293*****	**0.157****	0.145*	**0.021****	**0.023****	**0.018***	**0.020****
	(4.87)	**(5.03)**	**(2.97)**	**(2.84)**	**(4.86)**	**(5.03)**	**(2.29)**	(1.96)	**(2.56)**	**(2.56)**	**(2.03)**	**(2.11)**
Sabanci (10)	0.075*	0.069	-0.019	-0.012	0.084	0.078	-0.032	-0.021	**-0.015****	**-0.021****	**-0.019*****	**-0.025*****
	(1.69)	(1.48)	(-0.44)	(-0.25)	(1.40)	(1.29)	(-0.42)	(-0.25)	**(-2.10)**	**(-2.09)**	**(-2.82)**	**(-3.36)**
Yasar (8)	-0.073	-0.080	-0.122	-0.081	-0.084	-0.091	-0.161	-0.101	-0.015	-0.022	-0.017	-0.019
	(-0.90)	(-1.02)	(-1.49)	(-1.16)	(-0.74)	(-0.84)	(-1.38)	(-1.04)	(-1.06)	(-1.49)	(-1.30)	(-1.39)
Yildiz (3)	-0.079	-0.074	-0.012	-0.030	**-0.537*****	**-0.535*****	-0.254	-0.224	0.023	0.029*	0.020	0.025
	(-0.87)	(-0.80)	(-0.13)	(-0.33)	**(-4.38)**	**(-4.14)**	(-1.44)	(-1.32)	(1.56)	(1.93)	(1.20)	(1.53)
Zorlu (3)	**-0.236*****	**-0.221*****	**-0.228****	**-0.298*****	**-0.415*****	**-0.392*****	**-0.388*****	**-0.456*****	-0.018	-0.005	**-0.021****	-0.009
	(-3.72)	**(-3.54)**	**(-2.72)**	**(-3.64)**	**(-4.48)**	**(-4.14)**	**(-3.60)**	**(-4.16)**	(-1.45)	(-0.20)	**(-2.16)**	(-0.43)
Observations	1,126	1,126	1,126	1,126	1,106	1,106	1,106	1,106	946	946	946	946
Firms	196	196	196	196	193	193	193	193	192	192	192	192
R^2	0.454	0.457	0.502	0.508	0.542	0.545	0.546	0.553	0.678	0.668	0.464	0.469
Median RE λ	0.715	0.708			0.714	0.709			0.385	0.392		

**Table 8. Business Group Governance and Business Group Value**

Table reports coefficients for group fixed effects (FE), group random effects, and pooled OLS regressions of group-level ln(Tobin's q) = ln(mean Tobin's q for group firms) on normalized group-level *TCGI and* subindices of *TCGI*, group-level control variables (coefficients are suppressed); ln(group total assets), group profitability, one-year asset growth rate, dummy for presence of a group bank, ln(group age), dummy for group where founder is alive, dummy for group with listed parent company, and year dummies). In regressions (1)-(2) firm Tobin's q's are equally weighted within each group; in regressions (3)-(8), they are weighted by assets. Number of observations (groups) is 105 (18). *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. t-values (in parentheses) use group clusters. R^2 is adjusted R^2 for OLS; within R^2 for FE and overall R^2 for RE Significant results (at 5% level or better) are shown in **boldface**.

Dependent variable	Group-level ln(Tobin's q)							
Firm weights within group	Equal	Equal	Assets	Assets	Assets	Assets	Assets	Assets
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Fixed Effects				**Random Effects**		**Pooled OLS**	
TCGI	**0.187****		**0.302*****		0.101		-0.010	
	(2.29)		**(2.34)**		(1.39)		(-0.11)	
Board Structure		0.002		-0.056		-0.086		-0.151
		(0.03)		(-0.61)		(-0.95)		(-1.39)
Ownership Structure		**0.152*****		**0.150*****		**0.134****		0.069
		(4.45)		**(3.69)**		**(2.53)**		(0.86)
Board Procedures		**0.218*****		0.219		**0.183****		**0.212****
		(2.90)		(1.58)		**(2.38)**		**(2.62)**
Disclosure		0.121		**0.362****		0.113		-0.029
		(1.67)		**(2.46)**		(0.97)		(-0.19)
Shareholder Rights		0.036		-0.006		0.014		-0.047
		(0.67)		(-0.07)		(0.32)		(-0.73)
R^2	0.710	0.779	0.544	0.597	0.272	0.507	0.336	0.369
Median RE λ					0.820	0.605		

Figure 1. Change in non-normalized *TCGI* and its Subindices over 2006-2012
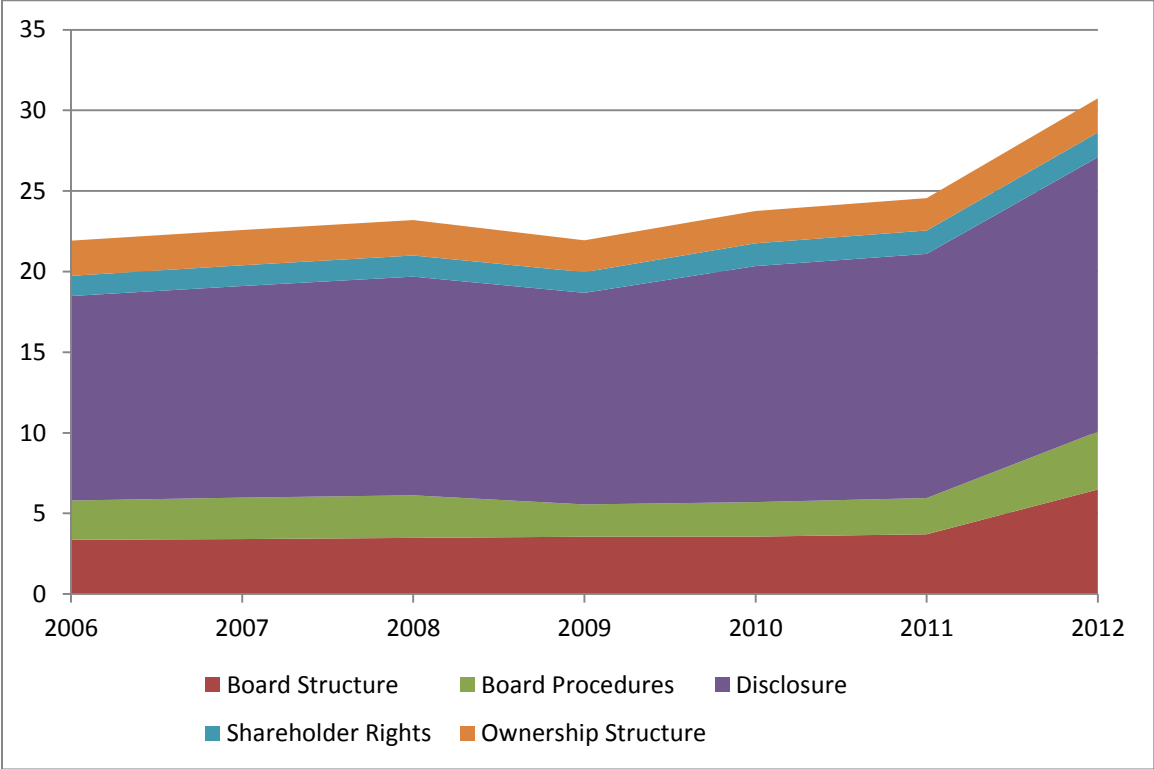
Figure 2. Histogram of non-normalized *TCGI* (pooled over 2006-2012)
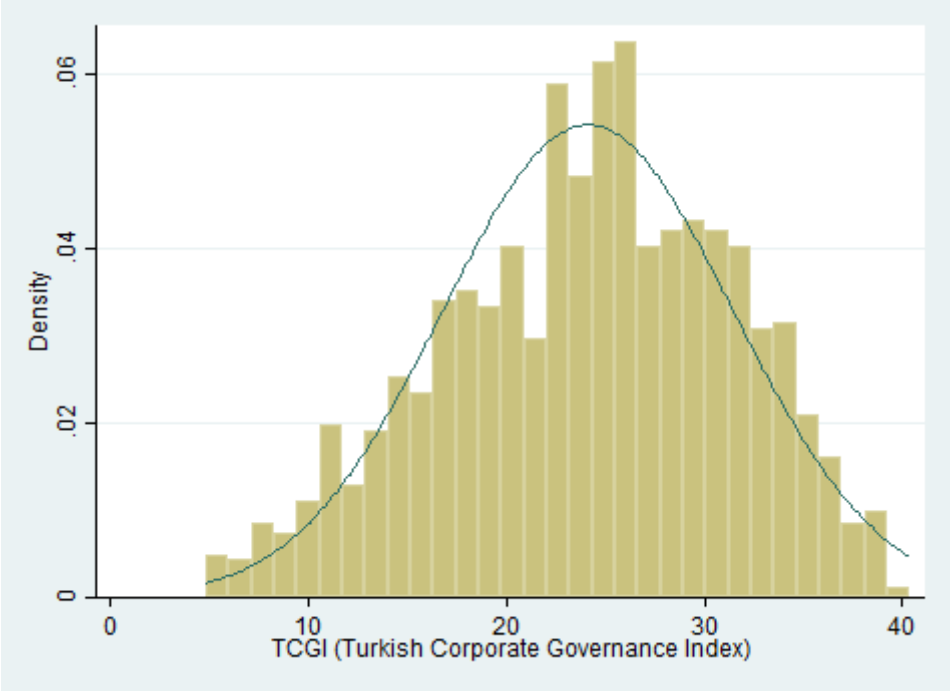
Figure 3. Scatterplot of: Ln(Tobin's *q*) & Normalized *TCGI*

Scatterplot (pooled across years) of *ln*(Tobin's *q*) on Normalized *TCGI*, and corresponding regression line (coeff. = 0.0437; *t* = 2.95). Observations are identified as outliers if studentized residual from regressing *ln*(Tobin's *q*) on *TCGI* (year-by-year) > ±1.96. Sample is 1,204 observations (225 firms).
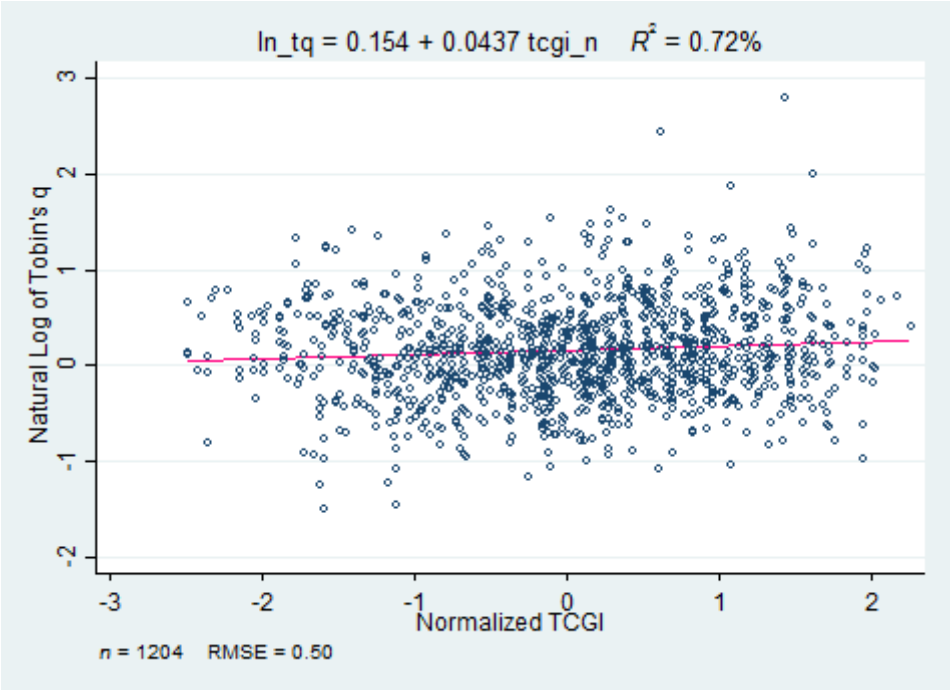
Figure 4. Scatterplot of Group Governance and Group Age

Figure shows scatterplot (pooled across years) of mean group *TCGI* on ln(group age), and corresponding regression line (coeff. = -0.99, *t* = -1.65 with group clusters and t=--3.34 with firm clusters). Sample is 125 group-year observations (based on 18 groups and 332 firm-year observations). Groups (in order of decreasing size in 2011): Is Bank (Is), Sabanci (S), Koc (K), Dogus (Ds), Oyak (O), Enka (Enk), Yildiz (Yi), Cukurova (Ck), Zorlu (Z), Akkök (As), Dogan (Dn), Eczacibasi (E), Anadolu (An), Yasar (Ys), Akfen (Af), Borusan (B), Alarko (Ak), Ihlas (I).
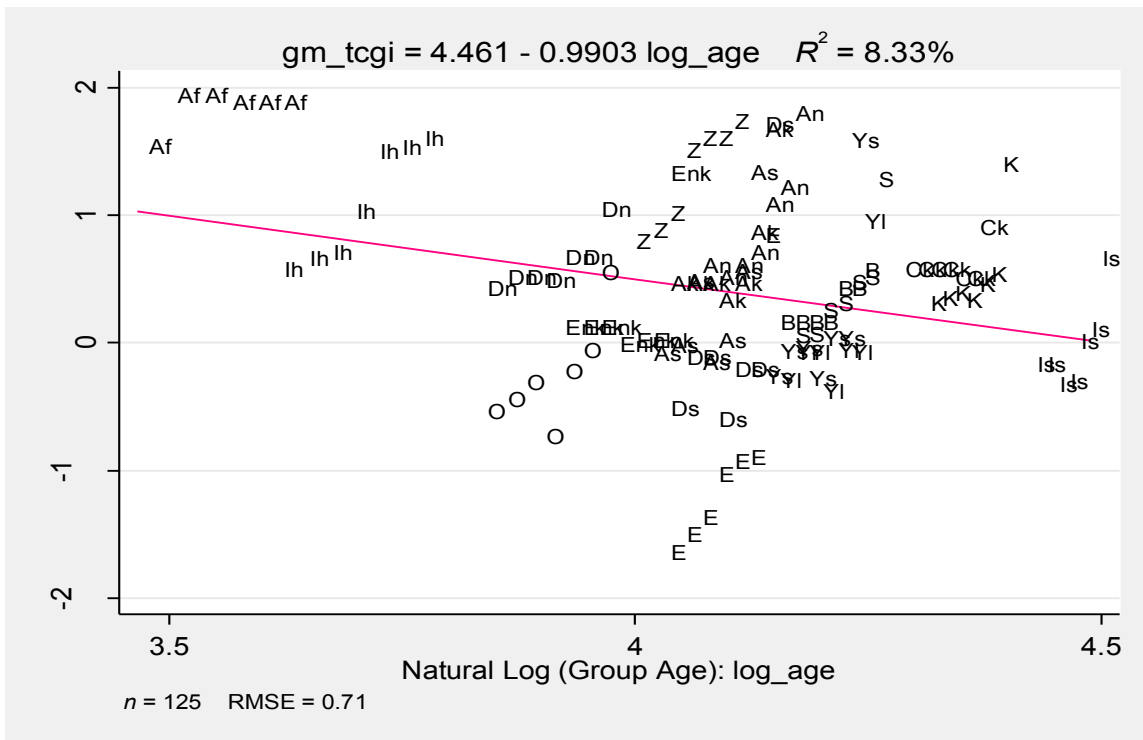
Appendix
Table 1. Principal Component Analysis (PCA)

Panel A displays the factor loadings of each subindex in two factors retained in the PCA. Panel B displays the factor loadings of each goverance element in 14 factors retained in the PCA. Both procedures use varimax rotation. We apply the Kaiser (1958) criterion and retain the factors with eigenvalues greater than 1.0. In both panels, we report the *Eigenvalues*, the relative weight of each factor in the total variance (*Proportion*), the cumulative weight of all retained factors (*Cumulative*), and the the variance that is unique to each governance element (or subindex) and not shared with other elements (or subindices) (*Uniqueness* = 1 −*Communality*, where communality is the variance that is shared with other variables. Factor loadings which exceed 0.4 are in **boldface**.

Panel A	Eigenvalue	Proportion	Cumulative	Board Structure	Board Procedures	Disclosure	Ownership Structure	Shareholder Rights
Factor1	2.09	41.88	41.88	0.72	0.82	0.82	0	0.45
Factor2	1.02	20.38	62.27	-0.11	0.029	0.06	0.96	0.24
Uniqueness				0.46	0.31	0.32	0.06	0.72

Panel B	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Uniqueness
Eigenvalue	8.46	3.71	2.65	2.24	2.02	1.63	1.40	1.36	1.32	1.20	1.19	1.17	1.08	1.03	
Proportion	18.0	7.9	5.6	4.7	4.3	3.5	2.9	2.8	2.8	2.5	2.5	2.5	2.3	2.2	
Cumulative	18.0	25.9	31.5	36.3	40.6	44.0	47.0	49.9	52.7	55.3	57.8	60.3	62.6	64.8	
Board Structure															
BS 1	0.08	0.12	**0.91**	-0.05	0.12	0.04	-0.01	0.01	0.01	0.03	0.00	-0.02	0.02	0.01	0.13
BS 2	0.11	0.11	**0.92**	-0.03	0.09	0.03	-0.02	-0.01	0.02	0.06	0.02	-0.03	0.04	-0.03	0.11
BS 3	0.09	0.14	0.28	0.04	-0.14	0.22	0.22	**0.52**	-0.14	-0.10	0.14	0.15	-0.09	0.25	0.36
BS 4	0.05	0.08	**0.86**	-0.06	0.11	0.06	-0.08	0.11	0.02	-0.01	0.04	-0.01	-0.05	0.03	0.20
BS 5	0.06	0.06	-0.13	-0.03	-0.01	0.08	**0.71**	0.01	-0.02	0.10	-0.02	0.20	0.09	-0.08	0.41
BS 6	0.14	0.24	**0.43**	0.15	0.23	0.25	0.09	0.26	-0.01	-0.13	-0.09	0.07	-0.20	0.08	0.45
BS 7	0.01	0.30	0.08	0.01	0.01	0.10	0.29	-0.17	0.00	-0.02	-0.19	-0.62	-0.03	-0.21	0.32
BS 8	0.09	0.09	-0.01	-0.07	0.03	-0.08	0.24	-0.02	-0.06	-0.02	-0.03	**0.81**	-0.01	-0.05	0.25
Board Procedures															
BP 1	0.08	0.18	0.10	-0.09	0.12	**0.77**	0.06	0.06	0.03	0.01	0.06	-0.12	-0.01	0.04	0.31
BP 2	0.02	0.11	0.20	0.05	**0.78**	0.17	0.08	0.04	-0.01	-0.08	-0.05	0.07	-0.02	0.08	0.29
BP 3	0.09	0.20	0.24	0.10	0.11	0.12	-0.22	**0.64**	-0.16	0.01	0.01	0.06	-0.03	-0.03	0.37
BP 4	0.01	0.18	0.21	-0.02	**0.52**	0.01	-0.43	-0.05	-0.15	0.21	-0.10	0.01	0.00	-0.15	0.36
BP 5	0.13	0.23	0.12	-0.15	0.20	0.34	-0.27	-0.03	-0.24	0.27	-0.10	-0.14	0.19	0.10	0.45
Disclosure															
DIS 1	**0.92**	0.05	0.06	0.03	0.02	0.03	-0.04	0.00	0.01	0.01	-0.04	-0.02	0.01	0.03	0.15
DIS 2	**0.84**	0.07	0.07	-0.07	-0.03	0.07	0.01	0.03	0.00	0.08	-0.08	0.03	0.05	0.11	0.25
DIS 3	**0.76**	0.13	0.06	0.01	0.01	0.01	0.07	0.05	0.01	-0.05	0.17	-0.03	-0.02	0.09	0.35
DIS 4	**0.90**	0.08	0.08	0.01	0.04	0.06	-0.04	0.00	-0.02	0.03	0.01	0.01	0.01	0.04	0.17
DIS 5	**0.68**	0.11	0.08	0.03	0.11	0.01	0.15	0.01	-0.08	0.06	0.05	0.04	0.05	-0.13	0.45
DIS 6	0.22	0.27	0.02	0.00	0.38	-0.07	-0.12	0.24	0.10	0.29	0.05	-0.04	0.12	-0.26	0.48
DIS 7	**0.86**	0.11	0.04	0.09	0.05	0.00	-0.03	0.05	-0.04	0.01	0.05	0.05	0.00	0.04	0.23
DIS 8	**0.71**	0.15	0.06	0.02	0.01	0.16	0.03	0.11	-0.03	0.10	0.16	0.01	-0.12	-0.07	0.38
DIS 9	0.37	0.39	0.03	-0.07	0.13	0.18	0.12	0.06	-0.12	0.30	-0.05	0.06	0.09	-0.14	0.50
DIS 10	0.14	0.00	-0.09	-0.15	0.20	-0.02	0.19	**0.56**	0.24	0.30	-0.03	-0.05	0.02	0.13	0.39
DIS 11	-0.03	0.05	0.07	0.03	-0.06	-0.09	0.19	0.11	**0.61**	-0.26	0.12	-0.18	0.12	0.13	0.41
DIS 12	0.04	0.02	-0.06	**0.91**	0.04	-0.07	0.00	0.02	0.08	0.01	-0.02	-0.03	0.08	0.03	0.14
DIS 13	0.24	0.13	0.00	0.04	0.09	0.01	-0.04	0.08	0.06	0.13	0.04	0.03	0.05	**0.76**	0.31
DIS 14	0.08	0.18	0.22	0.01	**0.70**	0.29	-0.10	0.07	0.05	-0.02	0.03	0.06	-0.03	0.08	0.31
DIS 15	0.19	0.28	0.08	-0.05	0.20	**0.71**	0.04	0.08	0.05	0.07	0.05	-0.03	-0.05	-0.01	0.31
DIS 16	**0.49**	0.16	0.00	-0.02	-0.04	0.13	0.15	0.08	-0.01	**0.46**	0.04	0.10	-0.01	0.15	0.44
DIS 17	0.17	**0.79**	0.14	0.02	0.10	0.12	-0.02	0.07	-0.03	0.07	0.03	-0.05	-0.02	0.06	0.28
DIS 18	0.13	**0.83**	0.15	0.02	0.10	0.15	0.05	0.11	0.02	0.02	0.01	-0.03	-0.02	0.06	0.22
DIS 19	0.20	**0.71**	0.22	0.06	0.09	0.06	-0.18	0.05	-0.04	0.18	0.05	0.01	-0.06	0.06	0.31
DIS 20	0.13	**0.73**	0.06	-0.12	0.12	0.12	0.14	-0.05	-0.02	-0.08	0.04	0.05	0.08	-0.02	0.37
DIS 21	0.24	0.38	0.01	-0.16	0.21	0.37	-0.24	-0.04	-0.10	0.16	0.03	0.06	0.21	-0.06	0.44
DIS 22	0.16	0.18	0.12	0.07	0.01	0.07	0.02	0.09	-0.01	**0.67**	0.09	-0.07	0.02	0.18	0.42
DIS 23	0.08	0.02	-0.06	0.12	0.05	0.10	0.08	0.38	0.01	0.21	0.12	-0.01	**0.53**	-0.16	0.45
DIS 24	0.25	0.14	0.15	-0.03	-0.08	0.16	0.01	0.12	0.06	-0.04	**0.58**	-0.12	0.11	0.15	0.45
Ownership Structure															
OW 1	-0.10	-0.23	0.14	0.29	-0.07	-0.05	0.04	-0.16	**0.51**	0.31	0.03	0.06	-0.07	-0.13	0.42
OW 2	0.07	0.01	0.02	-0.19	-0.03	-0.15	0.16	0.08	-0.68	-0.06	0.11	0.00	-0.01	-0.03	0.42
OW 3	0.01	0.03	-0.05	**0.88**	-0.02	-0.04	-0.01	0.10	0.09	-0.02	-0.03	-0.01	-0.01	0.01	0.19
OW 4	0.07	-0.17	-0.02	**0.65**	0.07	0.07	0.02	-0.26	-0.10	0.05	0.08	-0.05	0.04	-0.01	0.43
OW 5	0.01	0.18	0.11	-0.03	-0.02	0.19	-0.23	-0.06	0.17	-0.13	-0.21	0.17	**0.52**	-0.08	0.46
OW 6	0.03	0.11	0.01	-0.18	0.02	0.17	-0.15	0.13	0.01	0.01	-0.05	0.07	-0.67	-0.18	0.39
Shareholder Rights															
SR 1	0.08	-0.04	-0.05	-0.10	0.05	-0.20	-0.32	-0.06	0.12	0.04	**0.60**	0.12	-0.01	-0.29	0.35
SR 2	0.04	0.17	0.22	0.04	**0.57**	-0.12	0.04	0.05	-0.09	0.13	0.14	-0.27	0.09	-0.01	0.45
SR 3	-0.03	-0.11	-0.03	-0.06	-0.03	-0.25	-0.25	-0.03	0.19	-0.12	-0.61	-0.10	0.04	-0.19	0.39
SR 4	0.19	0.09	0.28	0.19	0.07	0.32	-0.01	0.15	-0.17	0.04	-0.10	0.02	0.09	-0.13	0.65

Table 2. TCGI and Firm Value and Profitability: Alternative Specifications

Table shows coefficients for indicated OLS, firm random effects, and firm fixed effects regressions of indicated outcome variables on normalized *TCGI* and control variables for 2006-2012. Control variables are same as in Table 4, eqns. 2-8; coefficients are suppressed. Variant A (same as Table 4): dependent variable is *ln*(Tobin's *q*) with outliers excluded. We exclude outliers for which a studentized residual from regressing the dependent variable (here *ln*(*q*)) on *TCGI* (year-by-year) > |1.96|). Variant *B*: outliers are not excluded; we instead winsorize *ln*(Tobin's *q*) at 1/99%. Variant *C*, outliers are neither excluded or winsorized. Variant D: similar to Variant A except dependent variable is Tobin's *q* instead of *ln(Tobin's q)*. Variant E; *S*ame as Variant *A* except selected control variables (indicated in Table 3) are winsorized. Variant F same as A except we lag control variables by one year. Variant G: dependent variable is ln(*Market/Book),* otherwise similar to Variant A. Variant H: dependent variable is *ln*(*Market/Sales*), otherwise similar to Variant A. Variant I: Dependent variable is EBIT/Assets$_{t+1}$; otherwise similar to Variant *A*. *t*-statistics (with standard errors clustered on firm) are in parentheses. Number of observations (firms) varies from 933 to 1126 (192 to 217). *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. Significant results (at 5% level or better) are in **boldface**.

	Fixed Effects		Random Effects		Pooled OLS	
	TCGI	Within R^2	*TCGI*	Overall R^2	*TCGI*	Adj. R^2
A Dep. var.: *ln*(Tobin's *q*), exclude outliers	**0.074***** (3.06)	0.482	**0.073***** (3.28)	0.395	**0.092***** (3.69)	0.436
B Dep. var.: *ln*(*q*) winsorized at 1/99%	**0.084***** (2.67)	0.422	**0.070***** (2.77)	0.472	**0.080***** (2.95)	0.481
C Dep. var.: *ln(q),* outliers neither excluded or winsorized	**0.076***** (2.84)	0.468	**0.082**** (3.28)	0.509	**0.107***** (4.01)	0.565
D Dep. var: raw Tobin's *q* (exclude outliers)	0.159* (1.92)	0.191	**0.152**** (1.98)	0.658	0.116* (1.79)	0.334
E Var. A, except selected controls are winsorized	**0.076***** (3.23)	0.482	**0.077***** (3.49)	0.403	**0.095***** (3.81)	0.440
F Var. A, except use lagged controls	**0.084***** (2.32)	0.422	**0.070***** (2.77)	0.472	**0.080***** (2.95)	0.481
G Dep. variable: *ln*(Market/Book)	**0.111***** (3.55)	0.505	**0.110***** (3.78)	0.481	**0.114**** (3.15)	0.512
H Dependent variable: *ln*(Market/Sales)	**0.111**** (2.62)	0.483	**0.108***** (2.62)	0.539	**0.178**** (2.65)	0.509
I Dependent variable: (EBIT/Assets)$_{t+1}$	0.009 (1.59)	0.071	**0.010**** (2.34)	0.501	**0.010***** (2.30)	0.337

Table 3. Governance and Firm Value using Factors derived from PCA

Table shows coefficients for indicated OLS, firm random effects (RE), and firm fixed effects (FE) regressions of ln(Tobin's q) on the factors derived using the PCA. Equations 1-3 use all of the 14 factors retained in PCA, eqns. 4-6 use only the first three factors, and eqns 7-9 use the two factors retained in the PCA employing the subindices. Control variables are same as in Table 4, eqns. 2-8; coefficients are suppressed. t-statistics (with standard errors clustered on firm) are in parentheses. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. Σ is the sum of the first three (two) factors for eqns. 1-6 (7-9) with the corresponding t-value. Significant results (at 5% level or better) are in **boldface**.

Dependent variable				ln(Tobin's q)					
Factors based on		Elements						Subindices	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Factor	OLS	RE	FE	OLS	RE	FE	OLS	RE	FE
1	**0.055***	**0.053***	**0.054***	**0.046***	**0.047***	**0.048***	**0.106***	**0.065***	**0.055**
	(2.99)	**(3.40)**	**(2.98)**	**(2.76)**	**(3.30)**	**(2.98)**	**(3.81)**	**(2.71)**	**(2.20)**
2	**0.044**	**0.050**	**0.058***	0.029	**0.040**	**0.049***	0.010	0.018	0.044
	(2.05)	**(2.53)**	**(2.71)**	(1.35)	**(2.26)**	**(2.67)**	(0.43)	(0.82)	(1.49)
3	0.023	**0.038**	**0.052***	0.013	0.026	**0.036**			
	(1.05)	**(2.19)**	**(2.74)**	(0.63)	(1.60)	**(2.03)**			
4	-0.016	-0.046*	0.022						
	(-0.64)	(-1.80)	(0.30)						
5	0.031*	0.009	0.002						
	(1.81)	(0.55)	(0.11)						
6	0.043*	**0.060***	**0.083***						
	(1.97)	**(2.87)**	**(3.32)**						
7	-0.004	-0.017	-0.025						
	(-0.21)	(-1.08)	(-1.44)						
8	0.006	0.021	0.037*						
	(0.27)	(1.10)	(1.80)						
9	0.001	0.024	0.032						
	(0.03)	(1.36)	(1.63)						
10	0.003	0.025	0.035*						
	(0.15)	(1.41)	(1.81)						
11	-0.029	0.000	0.039						
	(-0.73)	(0.00)	(0.76)						
12	-0.002	-0.015	-0.019						
	(-0.10)	(-0.83)	(-0.87)						
13	0.026	0.030*	0.036						
	(1.49)	(1.73)	(1.60)						
14	0.025	0.008	-0.008						
	(1.16)	(0.39)	(-0.40)						
Σ	**0.123***	**0.141***	**0.163***	**0.088***	**0.113***	**0.132***	**0.116***	**0.082***	**0.099***
t-value	**(3.04)**	**(4.16)**	**(4.28)**	**(2.47)**	**(3.93)**	**(4.35)**	**(3.44)**	**(2.33)**	**(2.37)**
Observations	998	998	998	998	998	998	1156	1156	1156
Firms	188	188	188	188	188	188	198	198	198
R^2	0.184	0.162	0.218	0.186	0.296	0.303	0.466	0.510	0.541
Median RE λ		0.672			0.647			0.710	