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Corporate Governance Indices and Construct Validity

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Abstract

We conduct an exploratory analysis of how researchers can address the issue of "construct validity", which poses a major challenge to all studies of the effect of corporate governance on firm performance. Many corporate governance studies rely on aggregate governance "indices" to measure underlying, unobserved governance. But we are not confident that we know how to build these indices – often we are unsure both as to what is "good" governance, and how one can proxy for this vague concept using observable measures. These are construct validity questions. As the basis for analysis, we begin with our prior work, in which we build governance indices in four major emerging markets (Brazil, India, Korea, and Turkey). In that work, we argue that one must build country-specific indices, which use country-specific elements that reflect local norms, local institutions, and local data availability. We show that these similar-but-not-identical indices predict firm market value in each country and when pooled across countries, in firm fixed-effects (FE) regressions with extensive covariates. This approach puts great stress on the construct validity challenge of assessing how well a governance measure matches the underlying concept. We address here what can be said about how well these four country-specific indices, and subindices for aspects of governance such as board structure or disclosure, measure unobserved, underlying actual governance quality.

Keywords: Corporate governance indices, construct validity, Brazil, Korea, India, Russia, Turkey, boards of directors, disclosure, shareholder rights, ownership structure

JEL Classifications: G18, G30, G34, G39, K22, K29

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Dataset and code availability:

The datasets and replication statistical code for this paper are available at*:* http://ssrn.com/abstract=

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INTRODUCTION

A common strategy in corporate governance research is to build a corporate governance index and then see whether the index predicts firm value or performance. These indices are imperfect, but their use is widespread because researchers lack good alternatives (Bhagat, Bolton and Romano, 2008). One concern with governance indices is what they actually measure. The concept of governance is abstract and latent rather than concrete and observable, and we are not sure how to proxy for this vague concept using observable measures. This raises concerns about the degree to which the proxy (a governance index) measures what it claims, or purports, to be measuring. The fit between the observable proxy or "construct" (the governance index) and the underlying concept (governance) is known as construct validity.[1] This core issue is rarely addressed in corporate governance research. Larcker, Richardson and Tuna (2007) and Dey (2008) are exceptions.[2]

We discuss here what can usefully be said about which of the many possible governance indices are sensible constructs, which are likely to do a reasonable job of measuring of what they intend to measure? We conduct here an exploratory analysis of how to tackle this question, using tools drawn from the causal inference, education and psychology literatures.

The often-used Gompers, Ishii and Metrick (2003) "G" index illustrates the central role that governance indices play in corporate governance research and how central unaddressed issues of construct validity are to index construction. They create a governance index with 24 equally weighted elements that measure takeover defenses and provide evidence that this construct predicts firm value and performance. Some of these elements are directly chosen by firms; others by the states where they incorporate. Bebchuk, Cohen, and Ferrell (2009) criticize this index and argue that only six firm-chosen elements, which they use to build their own "E" index, predict firm value and performance; the remainder are noise. Straska and Waller (2014) beg to differ, and report evidence that the 18 measures that Bebchuk, Cohen and Ferrell want to drop from the G index, treated as an "O" (for other) index, predict takeover likelihood. Karpoff, Schonlau and Wehrly (2016) build yet a different subset of the G-index elements, which they call the "D" index, that also predicts takeover likelihood. The confusion would be compounded if one considered takeover defense elements not in the original G index, or sought to build a broader governance index not limited to takeover defenses.

As the basis for our own analysis, we begin with our own prior work (Black et al. 2014 and 2016), in which we build governance indices in four major emerging markets (Brazil, India, Korea, and Turkey). In those studies, we argue that using a "common index" that relies on the same set of

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[1] For background on construct validity, see Shadish, Cook and Campbell (2002). Strauss & Smith (2009) review more recent literature on construct validity.

[2] Linck, Netter and Yang (2008), Beekes, Hong and Owen (2010), and Lei and Song (2012) employ some of the methods we use. However, their principal focus is to reduce the dimensionality of their governance data.

governance "elements" in each country – as massively multicountry studies typically do[3] – is likely to yield poor constructs. As an example, consider board independence, often seen as a central component of corporate governance. Typical levels of board independence vary greatly across countries. Many Brazilian and Turkish firms have no independent directors at all. Korean firms are required to have a minimum of 25% independent directors, and Indian firms must have either a majority of independent directors or else at least one-third independent directors plus a non-executive board chair. Thus, a board structure element that asks whether a firm has one independent director is useful in Brazil and Turkey, but meaningless in India and Korea. Conversely, an element that asks whether a firm has a majority of independent directors is useful in India and Korea, but of limited value in Brazil and Turkey, where very few firms have a majority of independent directors. To use the fraction of independent directors as a governance element would also be misleading. The effect in Brazil and Turkey of firms moving from zero to one independent director may be very different from the effect in India or Korea firms moving from three to four independent directors (in these countries, a minimum percentage is required by law; Turkey added a minimum independence requirement during our sample period); or the effect from moving from a minority to a majority of independent directors.

As another example, consider audit committees. These committees might be important, but we cannot measure their value in countries such as India and Turkey, where all public firms must have an audit committee. In Brazil, many firms rely on a substitute local institution, the fiscal board, which is appointed by the shareholder's meeting rather than the board of directors. Only a minority of firms has an audit committee, and most of the firms with an audit committee have a fiscal board as well. The marginal contribution the audit committee makes to "governance" will thus be very different, and more nuanced, in Brazil than in other countries.

We pursue a different approach here and in our prior work. We do not assume that the same elements have the same meaning in different countries. Instead, we accept that the meaning of the same element will often differ across countries. We attempt to build different constructs in each country, that are likely to proxy for similar underlying governance *aspects*. More specifically, we first identify a limited number of general aspects of governance, using a combination of our own judgment, the available empirical evidence and such corporate governance theory as exists: board structure, disclosure, shareholders rights, related party transactions and ownership structure. Next, for each country, we identify elements (observable variables) that are "meaningfully" related to each of the general aspects. We treat an element *j* as meaningful in country *i* if: (i) element *j* is often believed to correspond to good governance (sometimes with empirical support, but often not, given the current state of the governance literature); (ii) we judge, based on our own knowledge, that it is likely to be relevant

[3] These studies include, e.g., Aggarwal, Erel, Stulz and Williamson (2006); Klapper and Love (2004); Durnev and Kim (2005) and Doidge, Karolyi and Stulz (2007).

to governance in country *j*; (iii) we have reasonably complete data on element *i* across the firms in our country *j* sample; (iv) there is reasonable variation in element *i* across firms in country *j*; and (v) element *i* is not too similar to another element that is also used in country *j*. Thus, the elements used in each country reflect a combination of local norms, local institutions and local data availability. We use these elements to build proxies for the general aspects of governance. We call these proxies "subindices." We then build each overall country governance index (*CGI*) as an equally weighted average of the subindices. Manifestly, many other approaches to building indices are possible.

How well does a particular construct (a board structure subindex in a particular country, say) represent the corresponding general aspect of governance (board structure)? We cannot assess the validity of board structure subindex, seen as a construct, simply by asking whether this subindex empirically predicts an outcome of interest (we focus here on Tobin's *q*). If board structure subindex predicts the outcome, it could still be a poor construct, which is measuring something else—perhaps about "governance," perhaps not – or is simply correlated with an omitted variable which is the "true" predictor of the outcome. Board structure index could also be a useful construct, yet fail to predict the outcome because the underlying theory that posits a relationship between the general aspect (board structure) and the outcome is wrong. Therefore, predictive power is neither necessary nor sufficient, as a test for construct validity.

We pursue here two approaches for assessing construct validity. First, we measure Cronbach's α scores, both for subindices (comprised of elements) and overall indices[4] (comprised of subindices). Cronbach's α measures the inter-item correlation among the elements of an index**.** If the elements of a subindex collectively contribute to measuring the same general aspect of governance, one would expect those elements to be positively correlated and to yield a reasonably high Cronbach's α. At the same time, overly high inter-element correlations suggest that two elements are not sufficiently distinct and are capturing the same concept. Furthermore, if subindices in fact capture distinct aspects of governance, Cronbach's α across subindices cannot be extremely high.

Our second approach uses principal component analysis[5] (PCA) as an alternative procedure to compute subindices. PCA consists of finding clusters (principal components) of related elements. Each component consists of a group of elements that correlate more among themselves than with other elements not belonging to that component. In this fashion, elements are aggregated according to their statistical properties rather than by prior leads from theory or previous empirical evidence. If our subindices (based on prior knowledge) are good constructs, one would expect that components will be

[4] A good general reference for Cronbach's α is Nunnally and Bernstein (1994).

[5] A good general reference for PCA is Jolliffe (2008).

loaded mostly or entirely of elements from a single subindex. We also perform regression analysis to test the predictive power of subindices vis-à-vis components.

We find in all four countries that overall indices that are calculated as the average of subindices present reasonable construct validity. Subindices in general have positive but moderate mean inter-subindex correlations suggesting that they capture different aspects of governance. At the same time, these correlations imply that any estimate of the effect of firm value or performance of a narrowly defined index, a single subindex, and even more so a single element such as board independence, is likely subject to omitted variable bias, due to omitting important aspects of governance. At the subindex level, we find that construct validity is reasonable in most cases, but is suspect for some subindices in some countries.

This paper is structured as follows: Section 2 describes the data, samples and the variables. Section 3 details the two approaches, Cronbach's α and Principal Component Analysis (PCA), that we use to assess the construct validity of country indices. Section 4 presents and discusses our results and Section 5 concludes.

2. Samples, Governance Surveys, and Indices

2.1. Sample Construction

To build country governance indices, we rely on nonpublic data from firm surveys that were conducted in Brazil (2004, 2006, and 2009), India (2006, 2007, and 2012) and Korea (1998-2004), and public data hand-collected from firm annual reports in Turkey (2006-2012). This data collection effort greatly improves data quality compared to public data or commercial surveys, but also limits sample size and available years. We exclude state-controlled firms, subsidiaries of foreign companies, and banks. Table 1 provides summary statistics.[6]

2.2. Construction of Governance Indices

Table 2 lists the subindices and their elements for Brazil, India, Korea, and Turkey. It illustrates why we build indices out of different elements in different countries. Building an index out of common elements is not feasible. For instance, consider a minimum requirement for a "common" index of having only elements which are measurable in all four countries and meaningful in at least two of them. Such an index would have only 15 elements: 5 for board structure, 4 for disclosure, 2 each for board procedure and ownership; and one each for shareholder rights and RPTs. Of the 15 elements, 12 are useful in three countries, but none are useful in all four. Furthermore, as Black et al. (2014) show, this common index would have no power to predict firm market value.

[6] Detailed information on our data sources, samples, and their representativeness can be found in Black et al. (2015). The Brazil, India, and Korea surveys are available on request.

Most elements are dichotomous (coded as "1" if a firm has the attribute and "0" otherwise). We normalize continuous variables to run from 0 to 1. Table 2 also indicates which elements are non-public (available only from our surveys). For each element, it indicates in which countries the element is used as an element and in which country it is either not available due to lack of data or not meaningful (forbidden, mandatory, too common, too rare or too similar to another element).

Within each subindex, we weight each element equally. We then scale each subindex to run from 0 to 100 and take their average to compute the *CGI*. Table 3, Panel A, provides summary statistics for our governance indices. When running regressions one wants coefficients to be comparable across countries. Only for this purpose, we normalize each subindex to mean 0 and standard deviation 1. Then, we sum the normalized subindices to create an overall country index. Finally, we normalize the country index to mean 0 and standard deviation 1.

Having a procedure for dealing with missing values is important. Consider, for instance, a case in which you have one element missing out of four (e.g., Shareholder Rights in India). It does not seem reasonable to throw out the information of the three remaining elements. We use the following procedure: if data for a given element is missing just for a small number of firms, we compute the corresponding subindex as the average of the non-missing elements. Using this procedure, the sample does not increase at all in India; very little in Brazil (10 observations out of 158; 6%), moderately in Turkey: from 998 to 1,199; 20%); and substantially in Korea: (from 2,149 to 3,098; 44%). The numbers for Korea and Turkey show the importance of dealing with missing elements, rather than dropping these observations. In subindices with high mean inter-item correlations, our procedure is likely to introduce little bias, because missing information is substituted with “similar” information, however, if inter-item correlations within a subindex are low, using the information contained of the other elements may result into a considerable bias.

Table 3, Panel B, provides for each country the correlations between subindices, the correlation between each subindex and the *CGI*. Since each subindex is mechanically correlated to the *CGI* (each subindex is a component of country *CGI*), we also report the correlation between each subindex and the average of the other subindices (index complement). Country *CGI* is correlated positively with each subindex; with correlation coefficients ranging from 0.19 (Ownership Structure in Korea) to 0.93 (Disclosure in Turkey). The correlations of subindices with their complements are generally positive, but often much smaller and sometimes insignificant. They range from -0.09 (Ownership Structure in Korea) to 0.62 (Board Procedures in Turkey). For Brazil, India and Turkey, inter-subindex correlations are also mostly positive and statistically significant (India has 2 negative correlations and Brazil has 1, but without statistical significance). Korea seems an exception because the Ownership Structure subindex correlates negatively with the other subindices.

It is worthwhile taking a more granular look at selected subindices. In Brazil, RPT Subindex correlates quite weakly with the other subindices. The low correlation is not inherently good or bad. The weak correlation could be a sign of a weak index that does not capture control of RPTs very well.

But it could also indicate that the RPT Subindex is capturing an aspect of overall governance that is not well captured by any other subindex. We return to what we can say about which interpretation is more likely below, in the PCA analysis. The negative correlation between Ownership Structure subindex with the other subindices in Korea could provide evidence of substitution between subindices, in which firms with strong scores on Ownership Subindex choose governance structures which give them lower scores on other subindices.

The sizeable inter-index correlations makes necessary the control for a broad corporate governance measure when assessing the predictive power of a particular aspect of governance, to avoid omitted variable bias (from omitting the rest of the measure). They also limit statistical power when we examine the effects of subindices individually.

3. Methodology to Assess Construct Validity

In this section we present the two methods that we use to assess the internal validity of country subindices: Cronbach's α and Principal Component Analysis (PCA).

3.1. Cronbach's Alpha

Cronbach's α is a measure of the correlation between elements of a multipart measure and ranges from 0 to 1. It is defined as:

$$\alpha = \frac{nr}{1+(n-1)r} \qquad (1)$$

Here n is the number of governance elements in the index and r is the mean correlation among the elements. A "high" α provides evidence that the elements measure a similar underlying concept. Conversely, a "low" α provides evidence that the elements are not capturing a coherent underlying concept. As eqn. (1) makes apparent, Cronbach's α measures whether the elements of a multipart measure correlate with each other. It does not – and cannot – directly assess how well the elements capture the underlying construct. Thus, a respectable α value can be seen as necessary, but not sufficient, for true construct validity.

Unfortunately, Cronbach's α has several important weaknesses. There is no simple measure for what counts as "high enough." One problem can be explained by analogy. Consider a test for general skill in mathematics. If the test consists solely of 20 problems in single-digit addition, measured α will be high, but this is only because one has, in substance, asked the same question 20 times. One must start instead with a conscious effort to ask different questions, covering different aspects of mathematical knowledge. For governance, one must choose elements which are *not* too similar to each other. If one succeeds, the inter-item correlations should generally be positive, but not "too high."

For a test designed in this way, to ask different questions, rather than multiple variants of the same question, one rule of thumb from psychology is that α values above 0.7 are considered strong, and values above 0.6 are respectable (Kline, 2000). However, much of the education and psychology

literature on Cronbach α ignores the sense in which high α, driven by high inter-item correlation, might be a sign of test weakness, rather than strength.[7]

Cronbach's α has other weaknesses. First, as n increases, α converges to 1 even if r is low. In effect, one can get a high α from a few, strongly correlated elements, or from a larger number of elements, that correlate more weakly with each other. Second, with dichotomous elements, such as the elements of our governance indices, correlations tend to be small, yielding lower α values.[8]

With all these weaknesses, one might wonder why one should use this measure. We can offer several incomplete answers. First, the alternative of ignoring construct validity concerns is not appealing. Second, we do not have a better measure. Third, we do not use Cronbach's α alone. Instead we use several different approaches, to understand the apparent validity of our governance measures. In particular, we attend closely to inter-element and inter-subindex correlations, and also use PCA analysis.

3.2. Principal Component Analysis

Our second approach relies on PCA. In this approach, one creates eigenvectors (linear combinations of governance elements) based on the correlation matrix between governance elements (or subindices). These are usually termed "principal components." PCA is related to but distinct from "factor analysis." The vector with the largest eigenvalue is the first principal component; the vector with the second largest eigenvalue is the second component, and so on. One usually seeks to interpret the components with the largest eigenvalues, and ignores components with low eigenvalues. One rule of thumb is to retain components with eigenvalues greater than 1.0. But this is only a crude rule, because the more elements one starts with, the more eigenvectors will have eigenvalues above 1.

In our setting, where we combine elements into subindices, one can construct principal components either as linear combinations of the subindices, or as linear combinations of the elements; we use both approaches. In forming principal components from elements, we examine the five components in each country with the highest eigenvalues.

One typically tries to interpret each component by examining the elements with high "loadings" for that component. A rule of thumb in factor analysis (which has strong similarities to PCA) is to focus on elements with loadings greater than 0.4 (Costello and Osborne, 2005); we use this rule of thumb here. Consider Turkey, for example (Table 5, Panel D). The first principal component has loadings > 0.4 on

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[7] Some studies suggest that inter-item correlations should be as high as possible to constitute a good index (Horst, 1966: 147). Others disagree and recommend smaller values. Briggs and Cheek (1986), for example, argue that the optimal balance between bandwidth and homogeneity of an index occurs when the mean inter-item correlations are in the range [0.2-0.4]. Clark and Watson (1995: 316) recommend inter-item correlations in the range of [0.15-0.20] for broad higher order constructs, and higher values, [0.40-0.50], for narrower constructs.

[8] Our discussion of Cronbach's α assumes that one starts with an index, and then measures α. One can also use the relative α values from different possible indices to choose between them. That effort, too, is fraught with challenges (Nunnally and Bernstein, 1994).

eight elements, all within Disclosure Subindex. This suggests that there is coherence to the disclosure subindex – its elements tend to load together. The second principal component has loadings > 0.4 on four elements, all within Board Structure Subindex. This similarity suggests that there is coherence to Board Structure Subindex. The third principal component "loads" (we use this term as shorthand for loadings > 0.4) on four different elements of the disclosure subindex. In contrast, if the strongest principal components loaded on elements of multiple subindices, this would suggest that the subindices are poorly designed, and do not capture coherent aspects of governance.

To interpret the principal components that one retains, it is common practice to rotate them. We use varimax rotation – a common choice, which preserves the orthogonality of the components, while maximizing the sum of the variances of the squared loadings (Joliffe, 2002: 269). Varimax rotation often results in principal components which are easier to interpret than alternative rotations.

3.3. Panel Data Analyses

Our outcome variable is Tobin's *q*, which is the ratio of the market value to the book value of a firm's assets. Tobin's *q* is a common outcome in "governance-to-value" studies. It is a measure of the value of minority shares, and does not capture any extra value of the control block. Tobin's q can be used to measure the value added by corporate governance; the idea is that better governance leads investors to ascribe higher value to the same assets. Some governance aspects can also redistribute value between controllers and minority shareholders, without affecting overall firm value. Tobin's *q*, is itself an often-criticized construct; it remains commonly used because there is no good replacement. In this study, we accept it as a reasonable proxy for the value effects of firms' governance choices.

To reduce the influence of high-*q* outliers, we use the natural logarithm of *q* and also exclude outliers (year by year), for which if a studentized residual from regressing ln(Tobin's *q*) on country the *CGI* > |1.96|. To limit reverse causation, in which changes in Tobin's *q* lead to changes in governance, we measure governance in the first part of a year and Tobin's *q* at year-end.

We run firm fixed effects (FE) regressions in each country using an unbalanced panel. The firm FE model is well-known (e.g., Wooldridge, 2010, § 10.2) We review here selected aspects that are relevant for our study; see Black et al., 2014, 2016, for more details. The model is:

$$\ln(q_{i,t}) = \beta_0 + \boldsymbol{\beta_1} \times \mathbf{CGI}_{i,t} + \boldsymbol{\beta}_2 \times \mathbf{x}_{i,t} + g_t + f_i + \varepsilon_{i,t} \qquad (2)$$

Here $\mathbf{CGI}_{i,t}$ is either an overall country governance index or a vector of subindices; $\mathbf{x}_{i,t}$ is a vector of covariates (listed in Table 6), which we assume to be exogenous, g_t are year dummies, f_i are firm effects Exogeneity requires, among other things that current country governance indices do not influence future **x**'s. This is unlikely to be strictly true, but may be a reasonable approximation, especially with firm

effects. Prior studies find that time varying firm characteristics only weakly predict governance.[9] Bhargava and Sargan (1983) suggest that assuming exogeneity is more reasonable if one uses a random effects or fixed effects specification to address unobserved heterogeneity, if the data has a "short" time dimension, and a time-persistent variable of interest. Both fixed effects and random effects will be inconsistent if there are omitted time-varying firm covariates that are correlated with both governance indices and Tobin's *q*.

Exogeneity also requires that the current outcome variable $\ln(q_{i,t})$ does not influence future governance or **x**'s. Greiser and Hadlock (2016) provide evidence that this assumption may not be satisfied in many corporate finance studies and discuss how one might test this assumption; doing so is beyond the scope of this project.

Subject to these exogeneity requirements, the firm FE estimator is consistent even if the firm effects are correlated with country governance indices and other covariates. However, fixed effects estimates rely only on within-firm variation over time, which reduces power. Since governance often changes slowly over time, the loss of power can be substantial. One also cannot use FE to study aspects of governance with little time variation, notably ownership structure.

We address the potential for correlated standard errors by clustering at the firm level, which allows for correlation within firms, across time.

4. Results and Discussion

4.1. Cronbach's α and Mean Correlations

4.1.1. Assessment for Overall Governance Indices

Table 4 reports information on Cronbach's α and mean inter-item correlations. Panel A considers the governance elements individually (not combined into subindices). Cronbach α values range from 0.70 in India to 0.86 in Turkey. These are reasonably strong values. However, mean inter-element correlations range from 0.05 in India to 0.10 in Turkey. Thus, the strong α scores are driven by a substantial number of elements (ranging from 27 in Korea to 44 in Turkey) rather than high inter-element-correlations. Histograms in Panels A-D of Figure 1 display the frequency distribution of pairwise correlations of governance elements for Brazil (43 elements), India (42 elements), Korea (27 elements) and Turkey (44 elements). In all four countries, the pairwise correlations are more often positive than negative. While the inter-element correlations range from a minimum of -0.62 (Brazil) to 0.97 (Turkey), most are relatively small, between -0.25 and +0.25. For Brazil correlations are in the range of [-0.62, 0.87], but only a few have absolute values exceeding 0.5. The mean (median) absolute value is 0.13 (0.08). India and Korea are similar.[10] The Turkey correlations are larger; the mean

[9] See Black, Jang and Kim (2006, Korea), Balasubramian, Black and Khanna (2010, India); Ararat, Black, and Yurtoglu (2015, Turkey).

[10] The mean (median) absolute value of the pairwise correlations is 0.11 (0.05) for India and 0.11 (0.09) for Korea.

(median) absolute values is 0.22 (0.13), and around 16% of the correlations exceed 0.5.[11] Most correlations are relatively small because most governance elements are binary and because, in choosing elements, we excluded potential elements that were too similar to each other. The mostly low correlations, combined with relatively strong Cronbach α values, suggest that, as intended, these elements capture different aspects of corporate governance.

We also investigate Cronbach's α and inter-item correlation for the overall governance indices, treating them as composed of subindices, rather than individual elements (Table 4, Panel B). Since subindices seek to capture different aspects of governance, one would hope for intermediate correlations. Conversely, high inter-index correlations might suggest that some subindices are measuring similar underlying constructs, and should perhaps be combined. Cronbach α values are smaller than in Panel A, even though the mean correlation is larger, due to the small number of subindices. Brazil, Korea, and Turkey have respectable α values, ranging from 0.50 to 0.58. India, however, is a noticeable laggard: 0.31. Most but not all inter-subindex correlations are positive, the mean absolute value ranges from 0.18 to 0.22 for Brazil, Korea, and Turkey, but is only 0.08 in India.

The Cronbach α exercise can inform one's assessment of the construct validity of the overall governance indices. For Brazil, Korea, and Turkey, our judgment is that the overall indices appear to be reasonable constructs. In contrast, for India, the lower subindex-based α score and low inter-subindex correlations provide a warning that construct validity is likely low for the India Corporate Governance Index, and should prompt investigation of why this might be and what, if anything, researchers might do about this.

4.1.2. Assessment for Subindices

In Panels C-H of Table 4, we focus on the construct validity of the subindices. If the subindices are well-designed, we hope to find intermediate α values for elements within a single subindex. High α values suggest that elements are too similar to each other; low values suggest that they are not capturing a similar underlying concept. In fact, Cronbach's α values are smaller than for the overall indices. This is expected due to the smaller number of elements in each subindex. However, most α values are reasonably high. They range from 0.11 for India Shareholder Rights to 0.86 for Turkey Disclosure; 5 of the 19 subindex α values are above 0.7; and 10 values are above 0.6. Only India Shareholder Rights Subindex has α below 0.3. Some of the lower observed α's result from a small number of measurable elements, either because data is not available, or because regulation that limits firms' governance choices.

[11] The higher correlations in Turkey may stem from Turkey's comply-or-explain corporate governance code, adopted in 2006. Many firms adopt most of the code elements, so these elements are strongly correlated.

Most subindices also have reasonable mean inter-element correlations, ranging from 0.03 for India Shareholder Rights to 0.36 for India RPTs. The correlations are between 0.30 and 0.36 for 3 of the pairwise comparisons; between 0.20 and 0.29 for 6 more; between 0.10 and 0.19 for 6 pairs; 0.09 for the remaining 4 pairs (3 of these pairs are from India).

This evidence suggests that most subindices, for most countries, are reasonable constructs. At the same time, this analysis suggests caution in relying on at least some subindices as good measures of underlying governance aspects. For example, the low Cronbach's α value for India Shareholder Rights suggests that this subindex is a poor construct. At the other extreme, Turkey Disclosure has a high Cronbach's α of 0.86. This high α is driven mostly by a large number of elements (23), rather than a large inter-element correlation (0.21); this combination suggests that this subindex provides a good measure of overall firm disclosure choices.

4.1.3. Lessons from Cronbach Alpha Analysis

The main lessons from our analysis of Cronbach's α and mean inter-item correlations are (i) our procedure for building indices and subindices yield reasonable constructs in most cases, but construct validity can be less satisfactory for specific countries and subindices (for us, mostly in India); (ii) in assessing construct validity, one should consider both Cronbach's α and inter-item correlations, with the ideal being to obtain intermediate inter-element correlations (high values suggest failure to choose distinct elements or subindices; while low values suggest that the items may not capture a coherent underlying construct; (iii) since correlations among elements of subindices are – and should be -- relatively low, subindices with only a few elements – increase the risk that one is not measuring well the intended general governance aspect; and (iv) the low correlations between subindices suggest that if one wants to measure overall governance, one needs a broad index; conversely, an index for a particular aspect, such as board independence, is a poor measure of overall governance.

4.2. Principal Component Analysis

Tables 5A-5D report the results of PCA analysis for Brazil, India, Korea, and Turkey, respectively. We report only principal components with eigenvalues above 1.0 (referred to as retained components). Panel 1 focuses on subindices. There are two retained components for Brazil, India, and Turkey, and one retained component for Korea. The second column reports the eigenvalues; the third reports the fraction of total variance explained by the component. The remaining columns show the loading of each subindex in the retained components.

For Brazil (Table 5A), Component 1 loads heavily on Disclosure, but also substantially on all other subindices except RPTs. This component explains 35% of total variance. Component 2 loads mainly on Ownership Structure and explains 20% of variance. RPTs does not load on either component, suggesting that it is not important in explaining variation in governance across firms. For India (Table 5B), Component 1 loads on Board Structure, Board Procedure and RPTs and explains 25% of variance,

while Component 2 loads on Board Procedure, Disclosure and Shareholder Rights, and also explains 25%. For Korea (Table 5C), the only retained component loads broadly on Board Structure, Board Procedure, Disclosure and Shareholder Rights, and explains 45% of the variance. For Turkey (Table 5D), Component 1 loads broadly on Board Structure, Board Procedure, Disclosure and Shareholder Rights and explains 41% of variance; Component 2 loads on Ownership Structure and explains 20% of the variance.

Summing up, for all countries in our sample, the first retained component loads substantially on either three or four of the subindices. This suggests that the subindices are collectively capturing a coherent underlying concept.[12] Only RPTs in Brazil and Ownership Structure in Korea do not load on any retained component. Thus, PCA analysis points in the same direction as Cronbach's α: to capture overall corporate governance one needs to consider a broad set of general aspects of governance. Furthermore, the portion of the variance explained by the retained factors is never above 62%, suggesting that the retained components do not capture the full richness embedded in the subindices.

Panel 2 focuses on individual elements. Although there are generally more than 5 components with eigenvalues above 1.0, we report only the 5 components with the highest eigenvalues; we term these the "main" components, although there are not always large differences between the fifth and sixth eigenvalues. In Brazil, Component 1 loads on Disclosure elements; Component 2 loads on Shareholders Rights and Disclosure; Component 3 loads on RPTs; Component 4 loads on Board Structure; and Component 5 loads on Ownership Structure. As discussed above, the strong tendency for particular components to load on the elements of particular subindices suggests that the subindices are coherent and generally capture different aspects of governance. At the same time, each of these components loads on at least 3 elements, suggesting that individual elements by themselves do not capture much of the total variance in governance.

Taken together, the main components explain 41% of the total variance. The remaining 8 components with eigenvalues exceeding 1.0 – not reported in Table 5A explain another 29% of variance, and thus still leave 30% unexplained. This provides evidence that one needs a broad index to capture firm-level variation. The 5 main components together load on all of the subindices, further suggesting the need for a broad overall index.

In India (Table 5B), Component 1 loads on Disclosure elements; Component 2 loads on RPTs, 7.2%; Component 3 loads more broadly on Board Procedure, Disclosure and RPTs; Component 4 loads on Board Procedure; and Component 5 loads on Disclosure. Taken together, these 5 components explain

[12] An analogy may be useful. Suppose that one seeks to measure mathematical ability, through tests of arithmetic, algebra, geometry, calculus, and statistics, for students who have taken all five subjects. If math ability is a coherent concept, we would expect a major retained component, often the first component to load broadly on most or all of the subject-specific tests.

31% of the total variance. In contrast to Brazil, where the main components loaded on elements of all subindices, the main components for India load only on Disclosure, Board Procedure, and RPTs. Shareholder Rights and Board Structure, at least as measured by our subindices, vary less across firms.

The limited variation in Board Structure could be due to India having high minimum legal requirements, which few firms choose to exceed. That limited variation makes it hard for a panel data design, with firm fixed or random effects, to detect the effect of Board Structure on firm value, even if that effect exists. For Shareholder Rights Subindex, the lack of loading for the main components reinforces our doubts, from the Cronbach α analysis, that this is a coherent subindex.

In Korea (Table 5C), Component 1 loads on 3 Board Structure elements and explains 17.8% of the variance; Component 2 loads on Board Procedure and Disclosure. The remaining components each load on elements of three subindices: Component 3 loads on Board Structure, Board Procedure and Shareholder Rights; Component 4 loads on Board Procedure, Disclosure and Shareholder Rights; and Component 5 loads on Board Procedure, Ownership Structure and Shareholder Rights. These results suggest that Board Structure is a coherent concept, but create some doubt for the other subindices.

In Turkey (Table 5D), Component 1 loads on Disclosure elements; Component 2 loads on Board Structure; Component 3 loads on Disclosure; Component 4 loads on a single Disclosure element; and Component 5 loads on one element of Shareholder Rights. These results suggest that at least Disclosure and Board Structure are coherent, but leave doubt for the subindices that do not enter any of these components – Board Procedure and Ownership Structure, and some doubt for Shareholder Rights, which enters the main components through a single element.

4.2.1. Lessons from the Principal Component Analysis

Our main conclusions are: (i) most of the main components load on elements of one or two subindices rather than having loadings that are scattered across three or more subindices (Korea is an exception). This result suggests that the subindices are measuring distinct and consistent constructs. (ii) components of several different subindices load for one or more of the main components, suggesting that a narrow index will not capture overall governance well. (iii) the elements of some subindices (Board Structure and Shareholder Rights in India, and Board Procedures and Ownership Structure in Turkey) do not load in any of the main components. This creates doubt whether these subindices capture any relevant underlying concept. (iv) most main components do not load on a single element (the exception is 2 components in Turkey), reinforcing the idea that one cannot capture a general aspect of governance with a single element.

A further takeaway applies to the design stage of a research project that relies on governance indices, when one is building an overall index and subindices, with outcomes hidden. The warning signs about low within-subindex or across subindex correlation from the Cronbach α analyses, and about limited variation and subindex coherence from the PCA analyses, can suggest the need to search for

additional elements, which might improve the index and subindices. Better or additional elements can sometimes be found, or suspect elements can be discarded. The PCA results can also suggest the value of breaking a subindex into sub-subindices. For example, Board Structure Subindex might be divided into Board Independence and Board Committees sub-subindices; and Disclosure Subindex might be divided into sub-subindices for financial and non-financial disclosure, with the PCA analysis helping to guide the not-always-obvious decisions on which element goes where. We used our exploratory analysis in precisely this way; it led us to modify the Turkey Board Structure Index for this and future projects.

4.3. Governance and Firm Value

In this section, we report results from firm FE analyses of whether governance predicts Tobin's *q*. For each country, we compare results using (i) our subindices, and (ii) the main principal components as predictors. Table 6 lists the covariates and the countries for which each one is available. Table 7 reports our regression analysis, omitting the coefficients on the covariates, year dummies and the constant term. Panel A reports the analysis using principal components as regressors; data is available only for firm-year observations with no missing governance elements. Panel B uses the same sample but switches to subindices as regressors. Panel C is similar to Panel B but includes all firm-year observations. Panel D is similar to Panel C but divides Board Structure Subindex into Board Independence and Board Committees subsubindices.

Panel A shows that in every country the first principal component significantly and positively predicts firm value (Tobin's *q*). Component 1 loads on Disclosure Subindex in Brazil, India, and Turkey, and on Board Structure Subindex in Korea. Component 2 takes a positive coefficient in all four countries but is statistically significant only in Korea; the Korea second component loads on Disclosure and Board Procedure subindices. All other main components are statistically insignificant.

In Panel B, we use the same sample (firm-year observations with no missing governance elements) but switch to subindices as regressors. Consistent with the Panel A results for component 1 in each country, Disclosure Subindex takes a positive and statistically significant coefficient in Brazil, India, and Turkey; and Board Structure Subindex takes a positive, significant coefficient in Korea. Consistent with the Korea results for component 2, Board Procedure Subindex and Disclosure Subindex take positive coefficients, and Board Procedure Subindex is statistically significant. In Brazil, Board Structure Subindex takes a positive and statistically significant coefficient. This result would not be expected based on the principal components regressions. All other subindices fail to predict firm value.

Panel C reports regressions on the full sample, in which we avoid loss of sample size by including data on firms with subindices computed based on non-missing elements, as described in Section 2.2. It is instructive to compare the full sample results for subindices in Panel C to the PCI results from Panel A for related principal components. The subindex results are substantially stronger. For example, in Turkey, we go from a barely significant result for Component 1, which loads on Disclosure [coeff. = .032; $t = 2.04$] to a stronger result for Disclosure Subindex [coeff. = 0.066; $t = 2.79$].

In Brazil and Korea, we also get sharper results for Disclosure Subindex than for the principal components which loads on Disclosure elements.[13] In Korea, the results for Board Structure Subindex in Panel C are statistically stronger ($t = 4.61$) than those for Component 1, which loads on board structure ($t = 3.86$). Thus, while the PCA results in Panel A are useful, in suggesting the validity of the subindices as constructs, they are not a good substitute for the subindices. Instead, the subindices seem to contain value-relevant information that related principal components do not.

From Panels B and C, e obtain a consistent result that Disclosure matters and a less consistent result that Board Structure might also matter. The results for Board Structure could be mixed due to how we built this subindex – which combines board independence and board committee elements. At this point, The PCA analysis suggests that these two sets of elements should perhaps not be combined. In Brazil, Component 4 loads on three Board Structure elements, all of which involve board independence; in Korea, Components 1 and 3 load on 6 Board Structure elements, of which 4 relate to board independence; and in Turkey, Component 2 loads on 4 Board Structure elements, of which 3 relate to board independence. Thus, the PCA analysis suggests that it might be useful to separately assess board independence and board committee elements. Following this clue, we split Board Structure Subindex into sub-subindices for Board Independence and Board Committees, and report regression results in Panel D. We now see stronger evidence that board independence predicts higher firm value. Board Independence Sub-subindex takes a positive, statistically significant coefficient in Korea and Brazil, and is marginally significant in Turkey. The exception is India, which has high minimum board independence requirements. Our Board Independence Sub-subindex can capture only variation above those minimums. That variation might be limited or unimportant to firm value. In contrast, Board Committees Sub-subindex is positive and significant only for Korea, and indeed takes a negative coefficient for Brazil and Turkey.

5. Conclusion

Corporate governance studies frequently rely on indices which are assumed to capture an underlying corporate governance aspect. However, the construct validity of these indices is rarely addressed. This paper is a first attempt to investigate how the construct validity of these indices can be assessed, and what can be learned about index construction from that effort. We study the construct validity of corporate governance indices in four major emerging markets: Brazil, India, Korea, and Turkey. We do so at two levels: for overall governance indices, comprised of subindices, which are comprised of governance elements, and for subindices, comprised of elements. We use three principal measures: Cronbach's α; inter-item correlations; and PCA. The overall indices generally appear to

[13] In Brazil Disclosure Subindex has coeff. = 0.191; $t = 3.83$; while Component 1, which loads only on Disclosure, has coeff. = 0.168; $t = 2.68$. In Korea, Disclosure Subindex has coeff. = 0.022; $t = 2.82$; while Component 2, which loads on Board Procedure and Disclosure, has coeff. = 0.013; $t = 1.98$.

provide reasonable construct validity. The mean correlations across subindices are moderate, suggesting that the subindices in fact capture different aspects of governance. Conversely, these correlations suggest that inference from a narrow index, a single subindex, or, even worse, a single element, likely suffers from omitted variable bias, because of the omission of important aspects of governance.

At the subindex level construct validity in often reasonable, but we find exceptions, where one has less confidence that a subindex is measuring a coherent underlying governance aspect. India Shareholder Rights Subindex is an example. One can also use the construct validity analysis as a guide to how to build indices and subindices. We rely on that analysis to guide an effort to divide Board Structure Subindex into sub-subindices for Board Independence and Board Committees.

We find that regressions of outcome variables (we focus here on Tobin's q) on principal components, while informative, are not a substitute for regressions on carefully built subindices. Instead the subindices often have greater statistical power in predicting Tobin's q.

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Table 1

Summary statistics on governance samples (BIKT countries)

For Korea our sample includes almost all public firms listed on the Korea Stock Exchange; for Turkey, our sample includes almost all public firms listed on the Borsa Istanbul. For Brazil and India, we rely on private firm surveys of firms. The table shows the sample size in each country, by survey year. Data excludes banks, SOEs, and subsidiaries of foreign companies.

Brazil sample. Number of firms and market capitalization for firms which responded to our Brazil surveys. Market capitalization is based on exchange rate at Dec. 31, 2009 of R$1.75/US$1 and is measured at end of each survey year. Last row indicates respondents that were public in 2009 and in the dataset at least once.

Survey year	Public firms	Responding firms (% of public firms)	Market cap (US$ billions)	Capitalization of responding firms (% of public firms)
2004	261	63 (24%)	524	260 (49%)
2006	233	92 (39%)	821	495 (60%)
2009	254	97(38%)	1,191	747 (62%)
all 3 surveys	254	17		
at least one survey	254	142 (56%)	1,191	854 (72%)

India sample. Number of firms and market capitalization for firms which responded to our India corporate governance surveys. Market capitalization is based on exchange rate at Dec. 31, 2012 of 54.45 rupees/US$1, and is measured at end of survey year. Last row indicates respondents that were public in 2012 and were in the dataset at least once.

Survey year	Public firms	Sample (no. of public firms)	Sample (% of public firms)	Market cap (US$ billions)	Capitalization of responding firms (% of public firms)
2006	2,526	260	10.3	115.3	21
2007	2,872	367	12.8	866.1	47.4
2012	2,986	220	7.4	473.1	37.7
all 3 surveys	1955	57	2.9	55.8	5.6
at least one survey	3665	537	14.7	791.5	60.8

Korea sample. Number and market capitalization of firms (excluding banks and SOEs) listed on Korea Stock Exchange and included in the sample. Market capitalization uses using each year-end's won/dollar exchange rate.

Survey year	Korea Stock Exchange (KSE) firms	Sample (% of KSE firms)	Market cap (US$ billions)	Capitalization of responding firms (% of KSE firms)
1998	733	469 (64%)	78.24	52.39 (67%)
1999	708	489 (69%)	207.37	161.83 (78%)
2000	690	516 (75%)	99.31	84.65 (85%)
2001	670	538 (80%)	135.62	126.73 (93%)
2002	661	444 (67%)	153.37	134.76 (88%)
2003	661	636 (96%)	219.24	208.55 (95%)
2004	668	497 (74%)	317.98	237.68 (75%)

Turkey sample. Total number of firms and market capitalization for all companies on National Market (Source: Borsa Istanbul (http://www.borsaistanbul.com/en/). Market capitalization is based on exchange rate at Dec. 31st of each year.

Survey year	Public firms	Sample (% of all public firms)	Market cap (US$ billions)	Capitalization of sample firms (% of public firms)
2006	290	188 (65%)	96	91 (95%)
2007	292	188 (64%)	161	154 (96%)
2008	284	187 (66%)	60	58 (97%)
2009	233	227 (97%)	130	127 (97%)
2010	241	199 (83%)	180	171 (95%)
2011	237	201 (85%)	129	120 (93%)
2012	242	206 (85%)	193	178 (92%)

Table 2

List of governance elements available in each country

Table indicates which governance elements we used in each country. In element label, the first letter indicates the country, the next ones the subindex that the element belongs to, and next the number of the element within that subindex (e.g., i_dis_11 is element 11 of Disclosure Subindex, for India). Elements in boldface are used as index elements. An element not boldfaced is available and potentially meaningful, but is not included in the index because it is too similar to another element that is used. NP (non-public): not publicly available, NA (not available): element is non-public and not collected in our private surveys; NM (not meaningful) because mandatory, not allowed, too rare or too common; We use "outside" and "independent" directors interchangeably.

For additional details on the elements, see the expanded working paper version of Black et al. (2014). Since completing that paper, based on part on the examination of construct validity in this paper, we: (i) removed two Turkey-specific elements from Board Structure Subindex (elements bs_6 and bs_10), and classified elements bs_13, bs_14, bs_15 and bs_20 as part of Board Independence Subsubindex rather than Board Committee Subsubindex. We did not renumber any elements.

ELEMENTS	BRAZIL	INDIA	KOREA	TURKEY
Board structure index *Independence elements*				
≥ 1 outside director on board	**b_bs_1 (NP)**	NM	NM	**t_bs_1**
> 1 outside director	b_bs_2 (NP)	NM	NM	**t_bs_2**
≥ 30% outside directors	**b_bs_3(NP)**	NM	NM	t_bs_3
≥ 50% outside directors	**b_bs_4 (NP)**	**i_bs_4**	**k_bs_4**	NM
strictly > 50% outside directors	NM	**i_bs_5**	**k_bs_5**	NM
CEO is NOT board chairman	**b_bs_7**	**i_bs_7**	NA	**t_bs_7**
Board chairman is outside director or firm has outside lead director	NM	NA	**k_bs_8**	NM
≥ 50% outside directors **or** ≥ 1/3 outside directors *and* CEO is not chairman[14]	b_bs_9 (NP)	**i_bs_9**	NA	NM
Audit comm. has outside director	NA	NA	NM	**t_bs_13**
Audit comm. has majority of outsiders	NM	**i_bs_14 (NP)**	k_bs_14	NA
Audit comm. has 2/3 outsiders	NM	i_bs_15 (NP)	**k_bs_15**	NA
Permanent fiscal board **or** audit comm. with minority shareholder representative exists	**b_bs_20**	NM	NM	NM
Committee elements				
Audit committee (comm.) exists	**b_bs_11**	NM	**k_bs_11**	NM
Audit comm. has non-executive chair	NA	NA	NM	**t_bs_12**
Compensation comm. exists	NM	**i_bs_16**	**k_bs_16**	NA
Outside director nominating comm. exists	NM	NA	**k_bs_17**	NA
Corporate Governance comm. exists	NM	NA	NM	**t_bs_18**
Permanent or near-permanent fiscal board exists	**b_bs_19**	NM	NM	NM
Board procedure index *General procedure elements*				
≥ 4 regular board meetings per year	NA	NA	**k_bp_1**	NA
> 4 physical board meetings in last year	**b_bp_2 (NP)**	NA	NA	NA
Firm has system to evaluate CEO	**b_bp_3 (NP)**	**i_bp_3**	NA	NA
Firm has system to evaluate other executives	**b_bp_4 (NP)**	**i_bp_4**	NA	NA
Firm evaluates outside or nonexecutive directors	NA	**i_bp_5**	**k_bp_6**	NA
Firm has succession plan for CEO	NA	**i_bp_6**	NA	NA
Firm has nonexecutive director retirement age	NA	**i_bp_7**	NM	NA
Directors receive regular board training	NA	**i_bp_8**	NA	NA
Only-nonexecutives annual meeting exists	NA	**i_bp_9 (NP)**	NM	NA
Only-outside directors annual meeting exists	NM	NA	**k_bp_10**	NA
Board receives materials in advance of meeting	**b_bp_11 (NP)**	**i_bp_11**	NA	NA
Nonexecutives can hire own counsel & advisors	NA	**i_bp_12**	NA	NA
Firm has code of ethics	**b_bp_13 (NP)**	**i_bp_13**	NA	**t_bp_13**
Firm has specific bylaw/policy to govern board	**b_bp_14 (NP)**	NA	**k_bp_14 (NP)**	**t_bp_14**
Directors' positions on board meeting agenda items are recorded in board minutes	NA	NA	**k_bp_15(NP)**	NA

[14] This element is required by India's "Clause 49"; however, not all firms comply.

ELEMENTS	BRAZIL	INDIA	KOREA	TURKEY
Firm has ≥ 1 foreign outside directors	NM	NA	**k_bp_16**	NA
Shareholders approve *outside* directors' aggregate pay (separate from approval of *all* directors' aggregate pay)	NM	NM	**k_bp_18 (NP)**	NA
Outside directors attend at least 70% of meetings	NA	NA	**k_bp_19**	NA
Audit committee procedure elements				
Firm has internal audit/control function	NA	NA	NM	**t_bpa_1**
Audit comm. members & chair are disclosed	NA	NA	NM	**t_bpa_2**
Firm has bylaws governing audit comm.	NA	**i_bpa_3**	**k_bpa_3 (NP)**	NA
Company discloses audit comm. bylaws	NA	NA	NA	**t_bpa_4**
Audit comm. recommends external auditor	NA	**i_bpa_5**	NA	NA
Outside directors on audit comm. meet separately	NA	**i_bpa_6**	NA	NA
Audit comm. includes accounting or finance expert	NA	NM	**k_bpa_7 (NP)**	NA
Audit comm. (Korea: or internal auditor) approves head of internal audit team	NM	NA	**k_bpa_8 (NP)**	NA
Audit comm. meets at least 4 times per year	NA	NA	**k_bpa_9**	NA
Disclosure index ***Financial disclosure elements***				
RPTs are disclosed to shareholders	**b_dis_1 (NP)**	**i_dis_1**	NA	NM
Firm has regular meetings with analysts	**b_dis_2 (NP)**	**i_dis_2**	**k_dis_2 (NP)**	NA
Firm puts annual financial statements on firm website	**b_dis_3**	**i_dis_3**	NA	**t_dis_3**
Quarterly financial statements are consolidated	**b_dis_4**	NA	NA	NM
Firm puts quarterly financial statements on firm website	**b_dis_5**	**i_dis_5**	NA	**t_dis_5**
Firm puts annual report on firm website	NA	**i_dis_6**	NA	**t_dis_6**
English language financial statements exist	**b_dis_7**	NM	**k_dis_7 (NP for past data)**	**t_dis_7**
Financial statements include statement of cash flows	**b_dis_8**	NM	NM	NM
Financial statements in IFRS or US GAAP	**b_dis_9**	NA	NM	NM
MD&A discussion in financial statements	**b_dis_10**	NM	NM	NA
Non-financial disclosure elements				
Firm discloses 5% shareholders	Feasible, (NM)	**i_dis_11**	NM	Feasible
Controlling shareholder disclosed	NM	NM	NM	**t_dis_12**
If shareholder agreement among controlling shareholders exists, it is disclosed (could be no control group or no agreement)	NA	**i_dis_13**	NA	NA
Firms puts directors' report on firm website	NM	**i_dis_14**	NM	NM
Firm puts corporate governance report on firm website	NM	**i_dis_15**	NM	**t_dis_15**
Firm discloses material events on firm website	NA	NA	NA	**t_dis_16**
Firm discloses annual agenda of corporate events	**b_dis_17**	NA	NA	**t_dis_17**
Firm charter are avail on firm website	NA	NA	NA	**t_dis_18**
Executive director compensation policy disclosed	NM	NA	NM	**t_dis_19**
Firm puts shareholder voting information on firm website	NM	NA	NA	**t_dis_20**
Firm discloses list of insiders	NM	NA	NA	**t_dis_21**
Firm discloses shareholding by individual directors	NM	NA	NM	**t_dis_22**
Governance charter or guidelines disclosed	NA	NA	NM from 2000	**t_dis_23**
Annual meeting results disclosed (attendance, agenda, voting results)	NM	NA	NM	**t_dis_24**
Board members' roles/employment disclosed	NM	NA	NM	**t_dis_25**
Board members' background disclosed	NM	NA	**k_dis_26**	**t_dis_26**
Board members date of joining board disclosed	NM	NA	NM	**t_dis_27**
Background of senior managers disclosed	NA	NA	NA	**t_dis_28**
Number of board meetings disclosed	NM	Feasible (NP)	NM from 2000	**t_dis_29**
Board resolutions disclosed	NA	NA	NM from 2000	**t_dis_30**
Code of conduct or ethics disclosed	NA	NM	NA	**t_dis_31**
Disclosure reliability elements				
Information on internal audit/control disclosed	NA	NA	NM	**t_dis_32**
Auditor does not provide non-audit services	**b_dis_33**	**i_dis_33**	NA	NA
Auditor does not provide non-audit services, or non-audit fees are < 25% of total auditor fees	NA	**i_dis_34**	NA	NA
Full board reviews auditor's recommendations	NA	**i_dis_35**	NA	NA
Audit partner is rotated every 5 years	NM	**i_dis_36**	NA	NA

ELEMENTS	BRAZIL	INDIA	KOREA	TURKEY
Ownership Structure index				
Largest shareholder's fractional ownership of common/voting shares	**b_own_1**	NM	NM[15]	**t_own_1**
1.5*((common shares/(total shares)-1/3)	**b_own_2**[16]	NM	NM	NM
Ownership parity[17]	**b_own_3**	NM	**k_own_3**	**t_own_3**
Size of control group[18]	**b_own_5**	NA	NA	NM
Firm has an outside 5% institutional investor	**b_own_6**	Feasible	NA[19]	**t_own_6**
Controllers do not have special nomination rights	NM	NM	NM	**t_own_7**
Class of shares with preferred voting rights does not exist	NM	NM	NM	**t_own_8**
Shareholder Rights index				
All directors serve one year terms	**b_sr_1**	NA	NM	NA
Outside directors serve one year terms	NA	**i_sr_2**	NA	**t_sr_2**
Firm allows voting by postal ballot	NM	**i_sr_3**	k_sr_3	NM
Company has policy against insider trading	NA	**i_sr_4**	NA	**t_sr_4**
Board includes at least one member elected by minority shareholders	**b_sr_5 (NP)**	**i_sr_5**	NM	NA
Cumulative voting for election of directors	Feasible (NP)	NM	**k_sr_6**	NM
Director candidates disclosed to shareholders in advance of shareholder meeting	NM	NA	**k_sr_7**	NA
No class of shares w. special nomination rights (except to give rights to 2nd major shareholder)	NM	NM	NM	**t_sr_8**
No class of shares w. multiple voting rights	NA	NM	NM	**t_sr_9**
No founder shares or other special cash flow rights	NA	NM	NM	**t_sr_10**
Firm has investor relations department (or contact person)	NM	NA	NA	**t_sr_11**
Freezeout offer to minority shareholders based on shares' economic value	**b_sr_12**	NM	NM	NM
Takeout rights on sale of control above legal minimum	**b_sr_13**	NM	NM	NA
Disputes with shareholders subject to arbitration	**b_sr_14**	NM	NM	NM
Firm has no authorized capital or provides preemptive rights	**b_sr_15 (NP)**	NM	NM	NM
Free float is at least 25% of total shares	**b_sr_16 (NP)**	NA	NA	NA
Related Party index ***RPT Volume elements***				
No loans to insiders	b_rpt_1 (NP)[20]	NA	NA	t_rpt_1[21]
No significant sales to/purchases from insiders	b_rpt_2 (NP)	NA	NA	NA
No real property rental from or to an insider	b_rpt_3 (NP)	NA	NA	NA

[15] Fraction of shares held by controlling shareholder and relatives. Controlling shareholder may not be largest shareholder. For example, a chaebol firm may be controlled by its chairman, but the largest owner may be another member of the chaebol group. Data on largest single shareholder is not available.

[16] Under Brazilian law the ratio of common/total shares must be at least 1/3; so under this formula, element values span [0, 1].

[17] Ownership parity = (1 – disparity), disparity = (fraction of voting rights held by all affiliated shareholders - ownership by controlling shareholder and family members). In Brazil, use 1 – (fraction of common [voting] shares held by largest owner)/(fraction of total shares held by largest owner)).

[18] Defined as (((no. of members of control group, winsorized at 11) -1)/10). Number of members of shareholder agreement, if any; otherwise, number of 5% shareholders who together hold 50% of common shares, or 11 (if all together own less than 50%).

[19] Korean firms must disclose 5% blockholders, but these include insiders (family members and affiliated firms), so it is nontrivial to identify outside 5% blockholders. For each firm, one needs to exclude related parties. Firms that belong to a *chaebol* group must identify their related parties, but there is no similar requirement for other firms.

[20] Brazil: Elements b_rpt_1, b_rpt_2, and b_rpt_3 are based on a single survey question: Does firm have loans to insiders, significant sales to or purchases from insiders, **or** rent real property to or from insiders. We treat them as a single element in computing related party index for Brazil.

[21] Turkey: Data available, but element not used because we do not have sufficient RPT elements to build an RPT Index, because t_rpt_4 and t_rpt_5 measure about the same thing.

ELEMENTS	BRAZIL	INDIA	KOREA	TURKEY
Negligible revenue from RPTs (0-1% of sales)	NA	NA	NA	t_rpt_4
No significant RPTs (RPTs/sales < 5%)	NA	NA	NA	t_rpt_5
No RPTs needed board/audit committee approval in last 3 years	NA	NA	NA	NA
RPTs are on arms-length terms	NA	i_rpt_7	NM	NA
RPT approval elements				
RPTs require board approval	**b_rpt_8(NP)**	i_rpt_8 (NP)	NA	NM
RPTs require approval by noninterested directors	**b_rpt_9 (NP)**	i_rpt_9 (NP)	NA	NA
RPTs require approval by noninterested shareholders	**b_rpt_10 (NP)**	NA	NA	NA
RPTs with *executives* approved by board, audit committee or shareholders	NA	**i_rpt_11**	NM	NA
RPTs with *executives* approved by audit committee or non-interested directors	NA	**i_rpt_12**	NA	NA
RPTs with executives approved by shareholders	NA	**i_rpt_13**	NM	NA
RPTs with *controlling shareholder* approved by board, audit committee or shareholders	NA	**i_rpt_14**	NA	NA
RPTs with *controlling shareholder* approved by audit committee or non-interested directors	NA	**i_rpt_15**	NA	NA
RPTs banned by company charter	**b_rpt_16**	NA	NM	NA

Table 3

Summary statistics and correlations for corporate governance indices

Sample is pooled across years. Other country indices are non-normalized (average of non-normalized sub-indices, each 0~100).

Panel A. Summary Statistics

	Brazil				
	Mean	**Median**	**Std.Dev.**	**Min**	**Max**
Disclosure Index	78.78	90.91	24.65	18.18	100
Board Structure Index	50.02	57.14	21.67	0	100
Ownership Structure Index	58.95	57.44	15.95	26.31	91.30
Board Procedure Index	66.40	66.67	25.03	0	100
Minority Shareholder Rights Index	46.37	57.14	26.32	0	100
Related Party Transactions Index	64.42	80.00	30.82	0	100
Brazil *CGI*	60.82	63.03	13.63	20.12	90.12
	India				
Disclosure Index	63.15	61.54	20.11	15.38	100
Board Structure Index	73.54	83.33	19.75	0	100
Ownership Structure Index					
Board Procedure Index	54.43	53.85	17.07	7.69	100
Minority Shareholder Rights Index	41.91	50	17.33	0	100
Related Party Transactions Index	62.70	66.67	29.13	0	100
India *CGI*	59.17	59.87	10.78	24.62	86.92
	Korea				
Disclosure Index	14.33	0	23.71	0	100
Board Structure Index	4.55	0	9.18	0	50
Ownership Structure Index	86.99	94.00	16.29	10.24	100
Board Procedure Index	38.88	40.00	17.31	0	100
Minority Shareholder Rights Index	40.17	25.00	36.99	0	100
Related Party Transactions Index					
Korea *CGI*	33.93	32.07	11	7.86	88.33
	Turkey				
Disclosure Index	60.98	65.22	22.59	0	100
Board Structure Index	49.21	50.00	24.92	0	100
Ownership Structure Index	42.01	36.98	17.50	0	100
Board Procedure Index	50.70	60.00	27.46	0	100
Minority Shareholder Rights Index	34.23	25.00	20.12	0	100
Related Party Transactions Index					
Turkey *CGI*	47.43	46.82	14.26	10.22	82.97

Panel B. Correlation coefficients

Pearson correlation coefficients for non-normalized country *CGI*, subindices, and "subindex complements" (for each subindex, the complement is *country CGI* – that subindex). *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. Significant correlations (at 5% or better) are in **bold**.

	Brazil					
	DS	**BS**	**OWN**	**BP**	**SR**	**RPT**
Brazil CGI	**0.76*****	**0.48*****	**0.36*****	**0.56*****	**0.70*****	**0.45*****
Subindex complement	**0.57*****	**0.24*****	**0.18****	**0.29*****	**0.47*****	0.08
Disclosure Index (DS)		**0.19*****	**0.24****	**0.40*****	**0.61*****	0.10*
Board Structure Index (BS)			0.10*	**0.28*****	**0.23*****	0.05
Ownership Structure Index (OWN)				0.05	**0.29*****	0.04
Board Procedure Index (BP)					**0.15*****	-0.01
Minority Shareholder Rights Index (SR)						0.07
	India					
India CGI	**0.52*****	**0.44*****		**0.55*****	**0.36*****	**0.64*****
Subindex complement	**0.17*****	**0.09****		**0.24*****	0.04	**0.13*****
Disclosure Index (DS)		0.039		**0.19*****	**0.07****	**0.09****
Board Structure Index (BS)				**0.07****	-0.01	**0.09***
Board Procedure Index (BP)					**0.14*****	**0.17*****
Minority Shareholder Rights Index (SR)						-0.04
	Korea					
Korea CGI	**0.75*****	**0.63*****	**0.19*****	**0.67*****	**0.74*****	
Subindex complement	**0.43*****	**0.51*****	**-0.09*****	**0.44*****	**0.46*****	
Disclosure Index (DS)		**0.42*****	**-0.06*****	**0.36*****	**0.38*****	
Board Structure Index (BS)			**-0.06*****	**0.44*****	**0.39*****	
Ownership Structure Index (OWN)				**-0.12*****	**-0.04*****	
Board Procedure Index (BP)					**0.39*****	
	Turkey					
Turkey CGI	**0.93*****	**0.65****	**0.19****	**0.73****	**0.35****	
Subindex complement	**0.58*****	**0.46****	**0.07****	**0.62*****	**0.24****	
Disclosure Index (DS)		**0.37*****	0.05*	**0.52*****	**0.20*****	
Board Structure Index (BS)			0.01	**0.43*****	**0.15*****	
Ownership Structure Index (OWN)				0.04	**0.05****	
Board Procedure Index (BP)					**0.27*****	

Table 4

Cronbach's α for country corporate governance indices and subindices

Table shows Cronbach's α (top row), mean correlation (*r*) between elements (middle row) and number of elements (in parantheses) for corporate governance elements, indices, and their subindices. There is no Cronbach's α for the ownership structure subindex in Korea, because the subindex has only one element.

		Brazil	India	Korea	Turkey
	Cronbach α	0.80	0.70	0.76	0.94
A. All governance elements	Mean *r*	0.09	0.05	0.10	0.25
	No. of elements	(43)	(42)	(27)	(44)
	Cronbach α	0.56	0.31	0.50	0.58
B. All subindices	Mean *r*	0.18	0.08	0.20	0.22
	No. of elements	(6)	(5)	(4)	(5)
	Cronbach α	0.50	0.38	0.74	0.75
C. Board Structure Subindex	Mean *r*	0.13	0.09	0.29	0.34
	No. of elements	(7)	(6)	(7)	(6)
	Cronbach α	0.58	0.56	0.49	0.61
D. Board Procedure Subindex	Mean *r*	0.19	0.09	0.07	0.24
	No. of elements	(6)	(13)	(12)	(5)
	Cronbach α	0.84	0.69	0.43	0.86
E. Disclosure Subindex	Mean *r*	0.32	0.15	0.20	0.21
	No. of elements	(11)	(13)	(3)	(23)
	Cronbach α	0.64		–	0.40
F. Ownership Structure Subindex	Mean *r*	0.26			0.10
	No. of elements	(5)		(1)	(6)
	Cronbach α	0.68	0.11	0.33	0.42
G. Shareholder Rights Subindex	Mean *r*	0.23	0.03	0.14	0.15
	No. of elements	(7)	(4)	(3)	(4)
	Cronbach α	0.77	0.77		
H. RPTs Subindex	Mean *r*	0.32	0.36		
	No. of elements	(7)	(6)		

Table 5A

Principal Component Analysis (PCA): Brazil

Panel 1: the loadings of each *subindex* for the two components retained in PCA and **Panel 2:** the loadings of each *governance element* for the five components with the highest eigenvalues. We report only the elements with loading above 0.4 in at least one of the five main components. We use varimax rotation. Loadings above 0.4 are in **boldface**. Elements are described in Table 2.

Panel 1: Subindex Components

	Eigenvalue	Explained variance	Board Structure	Board Procedure	Disclosure	Ownership Structure	Shareholder Rights	RPTs
Component 1	2.08	34.6%	**0.448**	**0.575**	**0.860**	0.399	**0.790**	0.173
Component 2	1.19	19.8%	-0.655	-0.435	0.074	**0.708**	0.224	0.118

Panel 2. Individual Element Components

Variable	Component 1	Component 2	Component 3	Component 4	Component 5
Eigenvalue	4.53	4.28	3.83	2.61	2.32
Explained variance	10.5%	9.9%	8.9%	6.0%	5.4%
Board Structure (7)					
b_bs_1	-0.007	0.074	0.025	**0.949**	-0.015
b_bs_3	-0.007	0.074	0.025	**0.949**	-0.015
b_bs_4	-0.016	-0.121	-0.152	**0.683**	0.080
Board Procedures (6)					
b_bp_13	**0.460**	0.022	-0.072	-0.054	-0.037
Disclosure (11)					
b_dis_2	**0.689**	0.313	0.036	-0.098	0.020
b_dis_3	**0.815**	0.129	-0.035	0.022	0.127
b_dis_4	**0.417**	0.236	0.032	0.062	-0.151
b_dis_5	**0.836**	0.229	0.042	-0.001	0.081
b_dis_7	**0.627**	**0.492**	-0.008	-0.050	0.120
b_dis_8	**0.709**	0.303	-0.012	0.039	-0.013
b_dis_9	**0.467**	**0.611**	0.019	-0.002	0.138
b_dis_17	**0.567**	**0.597**	0.001	-0.030	0.019
Ownership Structure (5)					
b_own_2	0.065	**0.432**	-0.116	-0.038	**0.439**
b_own_3	0.074	0.208	-0.052	-0.088	**0.649**
b_own_5	0.081	0.197	-0.086	-0.005	**0.768**
Shareholder Rights (7)					
b_sr_12	0.280	**0.779**	0.043	0.067	0.213
b_sr_13	0.195	**0.753**	0.063	0.146	0.190
b_sr_14	0.277	**0.797**	-0.032	-0.001	0.282
b_sr_16	0.101	**0.650**	-0.047	0.108	-0.057
RPT (7)					
b_rpt_1	-0.006	-0.021	**0.980**	0.005	-0.027
b_rpt_2	-0.006	-0.021	**0.980**	0.005	-0.027
b_rpt_3	-0.006	-0.021	**0.980**	0.005	-0.027
b_rpt_8	-0.131	0.060	**0.624**	0.013	0.024

Table 5B

Principal Component Analysis (PCA): India

Panel 1: the loadings of each *subindex* for the two components retained in PCA and **Panel 2:** the loadings of each *governance element* for the five components with the highest eigenvalues. We report only the elements with loading above 0.4 in at least one of the five main components. We use varimax rotation. Loadings above 0.4 are in **boldface**. Elements are described in Table 2.

Panel 1: Subindex Components

	Eigenvalue	Explained variance	Board Structure	Board Procedure	Disclosure	Shareholder Rights	RPTs
Component 1	1.37	24.7%	**0.568**	**0.439**	0.323	-0.284	**0.730**
Component 2	1.08	24.5%	-0.122	**0.597**	**0.543**	**0.748**	-0.009

Panel 2. Element Components

Variable	Component 1	Component 2	Component 3	Component 4	Component 5
Eigenvalue	4.02	3.04	2.27	1.83	1.82
Explained variance	9.5%	7.2%	5.4%	4.3%	4.3%
Board Procedures (13)					
i_bp_3	0.008	0.114	0.002	**0.758**	0.019
i_bp_4	0.090	-0.021	-0.010	**0.731**	-0.045
i_bp_5	0.069	0.075	-0.049	**0.545**	-0.033
i_bpa_5	0.086	0.056	**0.577**	-0.023	-0.099
i_bpa_6	0.059	-0.171	**0.4292**	0.227	-0.055
Disclosure (13)					
i_dis_1	0.109	0.158	**0.622**	-0.018	-0.096
i_dis_3	**0.891**	-0.022	0.099	0.066	-0.007
i_dis_5	**0.802**	-0.061	0.081	0.014	0.019
i_dis_6	**0.868**	0.045	-0.030	0.053	-0.005
i_dis_11	0.106	0.124	**0.623**	-0.135	-0.056
i_dis_14	**0.921**	-0.028	-0.001	-0.009	-0.025
i_dis_15	**0.914**	-0.038	0.024	-0.014	-0.029
i_dis_33	-0.016	-0.004	-0.063	0.038	**0.918**
i_dis_34	-0.026	0.046	-0.032	-0.057	**0.919**
RPT (6)					
i_rpt_7	0.033	0.336	**0.654**	0.090	-0.049
i_rpt_11	-0.011	**0.787**	0.216	-0.015	0.042
i_rpt_12	-0.053	**0.809**	-0.003	0.026	-0.018
i_rpt_14	-0.023	**0.805**	0.156	0.034	0.070
i_rpt_15	-0.040	**0.828**	-0.050	0.054	-0.016

Table 5C

Principal Component Analysis (PCA): Korea

Panel 1: the loadings of each *subindex* for the only component retained in PCA and **Panel 2:** the loadings of each *governance element* for the five components with the highest eigenvalues. We report only the elements with loading above 0.4 in at least one of the five main components. We use varimax rotation. Loadings above 0.4 are in **boldface**. Elements are described in Table 2.

Panel 1: Subindex Component

	Eigenvalue	Explained variance	Board Structure	Board Procedure	Disclosure	Ownership Structure	Shareholder Rights
Component 1	2.24	44.8%	**0.767**	**0.751**	**0.722**	-0.179	**0.730**

Panel 2. Element Components

Variable	Component 1	Component 2	Component 3	Component 4	Component 5
Eigenvalue	4.82	1.68	1.63	1.49	1.26
Explained variance	17.8%	6.2%	6.0%	5.5%	4.6%
Board Structure (7)					
k_bs_4	**0.701**	0.129	0.194	0.018	0.106
k_bs_5	0.269	-0.038	**0.567**	0.001	0.260
k_bs_8	0.011	0.279	**0.597**	0.064	-0.192
k_bs_11	**0.514**	-0.248	0.147	0.343	-0.147
k_bs_16	0.023	0.128	**0.735**	0.019	0.061
k_bs_17	**0.808**	0.084	0.082	0.114	-0.010
Board Procedures (12)					
k_bp_6	0.058	**0.710**	0.151	0.083	-0.126
k_bp_10	0.052	0.261	**0.414**	**0.412**	0.009
k_bp_16	0.072	0.245	0.064	-0.109	**0.682**
k_bpa_7	0.346	**0.411**	-0.214	-0.069	-0.082
k_bpa_9	0.063	0.169	-0.066	**0.499**	0.211
Disclosure (3)					
k_dis_2	0.392	0.299	-0.053	**0.463**	0.145
k_dis_7	0.083	**0.415**	0.045	**0.466**	0.129
k_dis_26	0.129	**0.736**	0.175	0.051	0.186
Ownership Structure (1)					
k_own_3	0.137	-0.033	-0.052	0.016	**0.543**
Shareholder Rights (4)					
k_sr_3	-0.079	-0.243	0.140	0.134	**0.578**
k_sr_6	0.141	0.021	**0.462**	0.218	0.361
k_sr_7	0.074	-0.042	0.103	**0.748**	-0.095
k_rpt_8	**0.661**	0.093	-0.126	-0.011	0.139

Table 5D

Principal Component Analysis (PCA): Turkey

Panel 1: the loadings of each *subindex* for the two components retained in PCA and **Panel 2:** the loadings of each *governance element* for the five components with the highest eigenvalues. We report only the elements with loading above 0.4 in at least one of the five main components. We use varimax rotation. Loadings above 0.4 are in **boldface**. Elements are described in Table 2.

Panel 1: Subindex Components

Eigenvalue	Explained variance	Board Structure	Board Procedure	Disclosure	Ownership Structure	Shareholder Rights
2.04	40.9%	**0.730**	**0.812**	**0.802**	-0.007	**0.445**
1.00	20.1%	-0.095	0.046	0.029	**0.957**	0.305

Panel 2. Element Components

Variable	Component 1	Component 2	Component 3	Component 4	Component 5
Eigenvalue	8.63	3.84	2.99	2.25	1.98
Explained variance	11.7%	6.9%	6.8%	5.0%	4.7%
Board Structure (6)					
t_bs_1	0.075	**0.908**	0.115	0.071	-0.017
t_bs_2	0.109	**0.909**	0.102	0.087	-0.010
t_bs_13	0.045	**0.867**	0.057	0.061	-0.060
t_bs_18	0.119	**0.412**	0.238	-0.022	0.014
Disclosure (23)					
t_dis_3	**0.912**	0.059	0.042	0.065	0.017
t_dis_5	**0.838**	0.054	0.061	0.093	-0.012
t_dis_6	**0.895**	0.072	0.082	0.058	0.049
t_dis_15	**0.671**	0.074	0.128	0.053	0.103
t_dis_16	**0.770**	0.091	0.119	0.058	-0.017
t_dis_18	**0.853**	0.042	0.104	0.076	0.028
t_dis_20	**0.706**	0.025	0.152	0.083	0.067
t_dis_24	**0.493**	-0.072	0.137	0.329	-0.004
t_dis_25	0.164	0.112	**0.770**	0.154	-0.054
t_dis_26	0.124	0.133	**0.843**	0.092	-0.064
t_dis_27	0.192	0.178	**0.714**	0.173	-0.038
t_dis_28	0.152	0.065	**0.738**	-0.016	-0.073
t_dis_29	0.124	0.086	0.092	**0.961**	0.022
Shareholder Rights (6)					
t_sr_9	0.053	-0.036	-0.063	0.023	**0.938**

Table 6

Definitions for Non-Governance Variables

Income statement (balance sheet) amounts are measured for each year *t* (at end of year *t*). * = winsorized at 99% (** = winsorized at 1%/99%) in Table 7.

	Definitions	Avail
Tobin's *q*	(book value of debt + market value of common stock)/ book value of assets	BIKT
ln (assets)	natural logarithm of book value of assets in USD	BIKT
ln (listed years)	natural logarithm of (years since public listing + 1) India: years since incorporation	BIKT
Leverage*	(Total liabilities)/assets. India: total debt.	BIKT
Net Income/assets**	Ratio of net income over assets	BIKT
EBIT/sales**	Earnings before interest and tax (EBIT)/total sales	BIKT
3-yr sales growth**	Geometric average sales growth during past three years (or available period if less)	BIKT
PPE/sales*	Ratio of property, plant, and equipment (PPE) to sales	BIKT
Share turnover*	(shares traded in year *t*)/(shares outstanding), adjusted for share issuances and splits	BIKT
Inside ownership	Fractional ownership of common (and equivalent) shares by largest shareholder	BKT
Foreign ownership	Fractional ownership by foreigners	IKT
Free Float	Fraction of shares floating on the stock exchange (excludes shares held by insiders)	IKT
Capex/PPE*	Ratio of capital expenditures to PPE	IKT
R&D/sales*	Ratio of R&D expenditures to total sales	IKT
Advertising/sales*	Ratio of advertising expense to total sales	IK
Exports/sales*	Ratio of export revenue to total sales	IKT
Market share	Firm's share of sales by all public firms in same industry	KT
MSCI	1 if firm belongs to Morgan Stanley Capital International Index (MSCI)	BIKT
US cross listing	1 if cross-listed in US (any level) in year *t*, 0 otherwise	BIKT
Year dummies	Year specific dummies	BIKT

Table 7

Governance Components, Subindices and Firm Value across Countries

Panel A. Firm fixed effects regressions of *ln*(Tobin's *q*) on either five principal components, covariates (listed in Table 4, coefficients suppressed) and constant term. Sample includes only firm-years with complete data on all elements. Panel B uses same sample as Panel A but replaces principal components with subindices. Panel C is similar to Panel B but uses full sample (for firm-years with missing elements, we build subindices using the average of the nonmissing elements of each subindex). Panel D is similar to Panel C, but separates Board Structure Subindex into Board Independence and Board Committees subsubindices. Observations are excluded as outliers if a studentized residual from regressing *ln*(Tobin's *q*) on *CGI*, year-by-year > ±1.96. *t*-statistics, using firm clusters, are in parentheses. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. Significant results (at 5% level or better) are in **boldface**; marginally significant results (at 10% level) in *italics*.

Panel A: Uses Principal Components

	Brazil		India		Korea		Turkey	
	Coeff.	**Main loading**	**Coeff.**	**Main loading**	**Coeff.**	**Main loading**	**Coeff.**	**Main loading**
Component 1	**0.167*** (2.68)**	DIS	**0.080** (1.98)**	DIS	**0.040*** (3.86)**	BS	**0.032** (2.04)**	DIS
Component 2	0.035 (0.50)	DIS/SR	0.028 (0.75)	RPT	**0.013** (1.98)**	DIS/BP	0.026 (1.39)	BS
Component 3	-0.020 (-0.67)	RPT	0.030 (0.92)	BP/DIS	0.006 (0.80)	BS	0.018 (1.10)	DIS
Component 4	0.051 (1.02)	BS	-0.008 (-0.24)	BP	0.008 (1.49)	DIS/BP	0.010 (0.54)	DIS
Component 5	-0.085 (-0.96)	OWN	0.030 (0.92)	DIS	0.003 (0.52)	diffuse	0.011 (0.42)	SR
Covariates	Yes		Yes		Yes		Yes	
Observations	148		411		2,149		998	
# of firms	77		199		539		188	
Within R^2	0.655		0.469		0.370		0.184	

Panel B: Uses Subindices (dropping observations with missing elements)

	Brazil	India	Korea	Turkey
Disclosure	**0.227*** (4.13)**	**0.090** (2.07)**	0.009 (1.40)	**0.057** (2.16)**
Board Structure	**0.096** (2.51)**	0.017 (0.43)	**0.026*** (3.80)**	0.017 (0.85)
Board Procedure	-0.008 (-0.24)	-0.031 (-0.72)	**0.012** (2.23)**	-0.009 (-0.50)
Shareholder Rights	-0.058 (-0.78)	0.029 (0.81)	-0.012 (-1.05)	0.009 (0.52)
Ownership Structure	-0.047 (-1.04)		-0.008 (-1.02)	0.060 (1.64)
RPT	-0.024 (-0.94)	0.020 (0.68)		
Covariates	Yes	Yes	Yes	Yes
Observations	148	411	2,149	998
# of firms	77	199	539	188
Within R^2	0.625	0.441	0.365	0.489

Panel C: Uses Subindices (all firms)

	Brazil	India	Korea	Turkey
Disclosure	**0.191*** (3.83)**	**0.090** (2.07)**	**0.022*** (2.82)**	**0.066*** (2.79)**
Board Structure	*0.068** *(1.77)*	0.017 (0.43)	**0.033*** (4.61)**	0.017 (0.83)
Board Procedure	-0.001 (-0.02)	-0.031 (-0.72)	0.006 (0.90)	-0.009 (-0.45)
Shareholder Rights	-0.027 (-0.41)	0.029 (0.81)	-0.002 (-0.14)	0.008 (0.53)
Ownership Structure	*-0.094** *(-1.98)*		-0.011 (-1.11)	*0.055** *(1.70)*
RPT	-0.031 (-1.26)	0.020 (0.68)		
Covariates	Yes	Yes	Yes	Yes
Observations	158	411	3,098	1,090
# of firms	81	199	644	193
Within R^2	0.592	0.441	0.384	0.484

Panel D: Uses Subsubindices for Board Independence and Board Committees

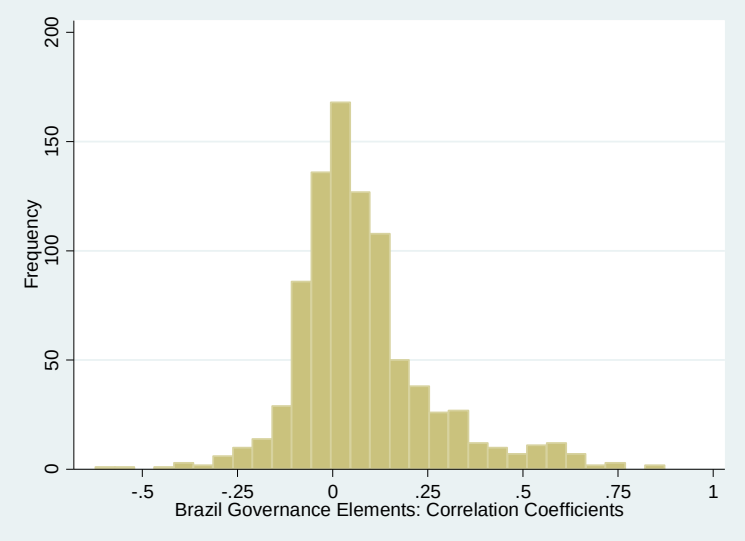
	Brazil	India	Korea	Turkey
Disclosure	**0.172*** (3.36)**	**0.090** (2.04)**	**0.020*** (2.73)**	**0.062** (2.58)**
Board Independence	**0.092** (2.61)**	0.012 (0.32)	**0.019*** (3.08)**	*0.036** *(1.89)*
Board Committees	-0.008 (-0.17)	0.011 (0.35)	**0.015** (2.37)**	-0.021 (-1.07)
Board Procedure	-0.007 (-0.21)	-0.032 (-0.72)	0.004 (0.59)	-0.006 (-0.33)
Shareholder Rights	-0.017 (-0.27)	0.028 (0.81)	-0.000 (-0.03)	0.003 (0.19)
Ownership Structure	**-0.098** (-2.00)**		-0.012 (-1.56)	*0.056** *(1.75)*
RPT	-0.027 (-1.26)	0.019 (0.67)		
Covariates	Yes	Yes	Yes	Yes
Observations	158	411	3,098	1,090
# of firms	81	199	644	193
Within R^2	0.592	0.441	0.384	0.484

Figure 1

Histogram of Correlations of Governance Elements

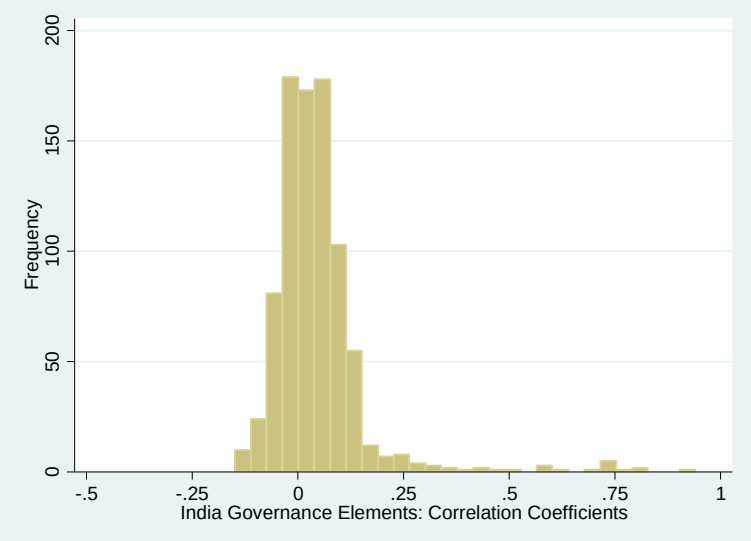
Panel A Brazil Corporate Governance Index (BCGI)

The histogram shows the frequency distribution for the correlations between the 43 elements of BCGI. The minimum (maximum) correlation is -0.62 (+0.87). The mean (median) value of the absolute values of the correlations is 0.13 (0.08).



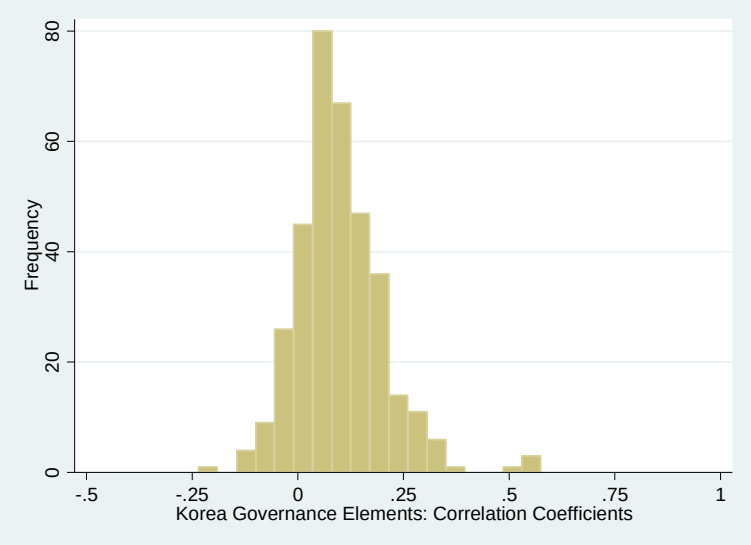
Panel B India Corporate Governance Index (ICGI)

The histogram shows the frequency distribution for the correlations between the 42 elements of ICGI. The minimum (maximum) correlation is -0.15 (+0.94). The mean (median) value of the absolute values of the correlations is 0.11 (0.05).



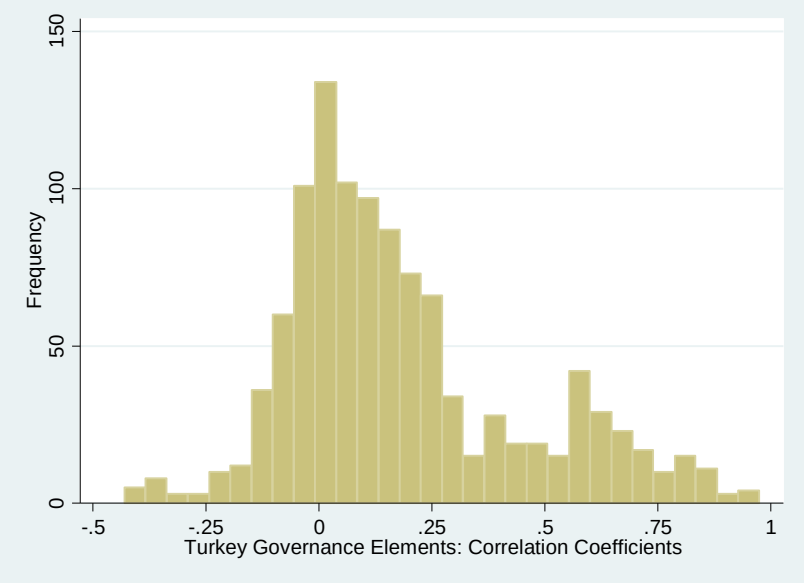
Panel C Korea Corporate Governance Index (KCGI)

The histogram shows the frequency distribution for the correlations between the 27 elements of KCGI. The minimum (maximum) correlation is -0.23 (+0.58). The mean (median) value of the absolute values of the correlations is 0.11 (0.09).



Panel D Turkey Corporate Governance Index (TCGI)

The histogram shows the frequency distribution for the correlations between the 44 elements of TCGI. The minimum (maximum) correlation is -0.43 (+0.97). The mean (median) value of the absolute values of the correlations is 0.22 (0.13).



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