Methods for Multicountry Studies of Corporate Governance: Evidence from the BRIKT Countries

(nearly final draft June 2014)

183 Journal of Econometrics 230-240 (2014)

Bernard Black
Northwestern University, Law School and Kellogg School of Management

Antonio Gledson de Carvalho
Fundacao Getulio Vargas School of Business at Sao Paulo

Vikramaditya Khanna
University of Michigan Law School

Woochan Kim
Korea University Business School

Burcin Yurtoglu
WHU - Otto Beisheim School of Management

European Corporate Governance Institute
Finance Working Paper No. 414/2014

Northwestern University School of Law
Law and Economics Research Paper No. 13-05

University of Michigan
Law and Economics Working Paper No. 2013-005

This paper can be downloaded without charge from the Social Science Research Network electronic library at:
http://ssrn.com/abstract=2219525

Methods for Multicountry Studies of Corporate Governance: Evidence from the BRIKT Countries*

© 2014 Bernard S. Black. All rights reserved.

Abstract. We discuss empirical challenges in multicountry studies of the effects of firm-level corporate governance on firm value, focusing on emerging markets. We assess the severe data, "construct validity," and endogeneity issues in these studies, propose methods to respond to those issues, and apply those methods to a study of five major emerging markets -- Brazil, India, Korea, Russia, and Turkey. We develop unique time-series datasets on governance in each country. We address construct validity by building country-specific indices which reflect local norms and institutions. These similar-but-not-identical indices predict firm market value in each country, and when pooled across countries in firm fixed-effects (FE) and random-effects (RE) regressions. In contrast, a "common index" that uses the same elements in each country, has no predictive power in FE regressions. For the country-specific and pooled indices, FE and RE coefficients on governance are generally lower than in pooled OLS regressions, and coefficients with extensive covariates are generally lower than with limited covariates. These results confirm the value of using FE or RE with extensive covariates to reduce omitted variable bias. We develop lower bounds on our estimates which reflect potential omitted variable bias.

Keywords: Brazil, Korea, India, Russia, Turkey, corporate governance, boards of directors, disclosure, shareholder rights, sensitivity bounds.

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

* We thank the *Journal of Econometrics* special editor, two anonymous referees, Vladimir Atanasov, Stijn Claessens, Art Durnev, Zev Eigen, Howell Jackson, Louis Kaplow, Mitchell Petersen, and Elie Tamer for comments and suggestions, Harun Akbas, Humberto Gallucci, Pranav Garg, Lorena Keller, Terence Leong, Joelson Sampaio, and Ben Thompson for research assistance; and Northwestern and Michigan Law Schools, Corporate Governance Forum of Turkey, at Sabanci University (Istanbul), WHU – Otto Beisheim School of Management, and the International Finance Corporation for financial support for data collection. We are grateful to the Asian Instiute of Corporate Governance, the Bovespa stockmarket, the Brazilian Comissao de Valores Mobiliarios, the Instituto Brasileiro de Governança Corporativa, and (Indian) National Stock Exchange and Bombay Stock Exchange, and the Indian Institute of Management, Bangalore, for supporting our survey efforts, and the Korea Corporate Governance Service for providing their survey results to us. Our Korea, Russia, and Turkey datasets and replication statistical code will be posted on the Social Science Research Network at www.ssrn.com and linked to the expanded working paper version of this article. The Brazil, India, and pooled datasets are available from the authors to researchers who agree to maintain the needed confidentiality.

1. Introduction

Studies of whether firm-level corporate governance affects firm market value face three core, related obstacles to identification. These can be broadly classified as "construct validity" (see Shadish, Cook and Campbell, 2002); limited data; and endogeneity. Data and construct validity concerns are especially severe in multicountry studies and in emerging markets, which are the focus of this study.

Construct validity is central in corporate governance research, yet rarely addressed. A governance index is a construct that imperfectly measures unobserved underlying governance. There is no direct way to quantify the gap between the construct and the underlying concept. Moreover, what matters in corporate governance often depends on local norms and institutions, which vary widely across countries. Thus, particular elements of a governance index may fit underlying governance well in some countries but poorly in others.

A second core problem is lack of data on governance. Time-series data are scarce. Often, data on particular governance elements are available in some countries but not in others. As we show, it is impossible to use public data to build a broad governance index based on common elements (a "common index"), even across the five countries we study. It is nearly impossible to do so even if one can rely on nonpublic data from surveys of firms, as we do in Brazil, India, and Korea. The best common index we can build has weak predictive power, perhaps because it is a poor measure of underlying governance.

The third core problem is endogeneity, which comes in several forms. Omitted variable bias is of particular concern. In individual countries, one can sometimes find natural experiments that provide identification for particular aspects of governance. In a multicountry study, this research design is not feasible. The next best approach, and the one we pursue here, is to build panel data and use firm fixed or random effects, plus extensive covariates, to limit (but not eliminate) omitted variable bias.

Most prior research on the relationship between corporate governance and market value in emerging markets suffers from these problems. The literature contains two principal strategies: single country studies ("deep and narrow") and "massively multicountry" studies that pool firms across many countries ("broad and shallow"). Single country studies suffer from limited sample sizes and lack of generalizability. Massively multicountry studies can provide reasonable sample sizes and are potentially generalizable, but to date, have failed to address these core obstacles to credible inference.[1]

We propose methods to respond to these challenges and then apply the methods to a study of five major emerging markets: Brazil, India, Korea, Russia, and Turkey ("BRIKT" countries).[2] Together, these countries provide a representative sample of moderately developed emerging markets. They differ in many ways, including legal traditions, language, culture, geographic location, and background legal rules.

We address data limitations by compiling, largely by hand, time-series data on governance in each country. Our data covers many though not all public firms in each country. Our overall dataset is, we believe, close to the best that researchers can currently build across multiple emerging markets.

We address construct validity by building country-specific corporate governance indices ("country *CGI*") which reflect local norms and institutions. Each is comprised (data permitting) of "subindices" for board structure, board procedure, disclosure, ownership structure, minority shareholder rights, and control of related party transactions. Each subindex is comprised of one or more governance "elements" that seek to capture specific aspects of governance that we consider relevant in each country. The subindices for each country are broadly similar, but the individual elements vary across countries, and reflect the norms, institutions, and data limitations in each country. In contrast, prior multicountry studies rely on a "common index," comprised of the same elements in each country. Our approach – conducting a multicountry study using similar-but-not-identical country indices – can be seen as a "middle way" between single-country studies, from which it is hard to generalize, and massively multicountry studies.[3]

Using our country *CGI* indices, we assess whether governance predicts firm market value (proxied by Tobin's *q*) in each country, in firm fixed effects (FE) and random effects (RE) specifications. We find positive coefficients on country *CGI* in all five countries, which are statistically significant in RE (in all five countries) and in FE (in all but Brazil). We then pool the indices across our countries (except Russia, which we cannot use when pooling), to create a Pooled *CGI* index. We find strong evidence with both RE and FE that Pooled *CGI* predicts higher Tobin's *q*.

We also generate a "Common Index," which consists of the 15 elements available in all four countries and useful in at least two of them (we require this because we seek to assess the relationship between governance and Tobin's *q across countries*). The Common Index has weak predictive power with RE and none with FE. In regressions including both the Common Index and either Pooled *CGI* or a "non-common" index built from the remaining elements, the Common Index has no power to predict Tobin's *q*. Instead, power comes entirely from the country-specific elements included in the non-common index.

Omitted variable bias is important. In both individual country and pooled regressions, coefficients on *CGI* are generally higher in weaker designs (pooled OLS versus RE; RE versus FE). This suggests that firm effects are important and that an FE specification is preferred, if feasible. Coefficients are also generally higher with fewer covariates. This provides evidence that to limit omitted variable bias, extensive covariates are important, in addition to firm effects. In multicountry studies that use regressions on pooled data across countries, it is important to interact the covariates with country dummies, thus allowing for country-specific "response surfaces."

We then assess the sensitivity of our estimates to remaining omitted variable bias using two sets of bounds, adapted respectively from Hosman, Hansen, and Holland (2010) and Altonji, Elder and Taber

(2005). These bounds use the sensitivity of coefficient estimates to *included* covariates to estimate lower bounds on those coefficients under assumptions about the extent of bias from omitted covariates. The lower bounds for country *CGI* are positive in all five countries and statistically significant in Korea and Russia, as well as for Pooled *CGI*.

We study here only firm-level governance in emerging markets. But the concerns we raise with common indices also apply to multicountry indices in developed markets such as the Institutional Shareholder Services index (e.g., Aggarwal et al., 2009), widely used indices of anti-director rights and creditor rights (La Porta et al., 1997, 1998), and measures of economic competitiveness (e.g., World Bank, 2013). In all these areas, we face a choice between a common index, whose elements may poorly capture the underlying concept in some countries, and richer, country-specific measures with uncertain generalizability.

This paper proceeds as follows. Section 2 describes our country-level governance indices. Section 3 develops our methodology. Section 4 presents results for individual countries. Section 5 presents pooled cross-country results. Section 6 contains sensitivity analyses, and Section 7 concludes.

2. Samples, Governance Surveys, and Indices

To build country governance indices, we rely on nonpublic data from firm surveys that we conduct in Brazil (2004, 2006, 2009) and India (2006, 2007, 2012), nonpublic data from surveys conducted by the Korea Corporate Governance Service in Korea (1998-2004), public data (from firm annual reports) in Turkey (2006-2012), and a mix of public and nonpublic data in Russia (1999-2005). This data collection effort greatly improves data quality compared to public data or commercial surveys, but also limits sample size and available years.

We build country indices as follows. We first identify specific governance "elements." We include an element in a country index if: (i) it is often believed to correspond to good governance (sometimes with empirical support, but more often not); (ii) it is relevant to governance in the judgment of the "local" coauthor in each country; (iii) we have reasonably complete data across firms; (iv) there is reasonable variation across firms; and (v) the element is not too similar to another element. Below, we use Brazil as an example to illustrate our approach. An expanded working paper provides information on data sources and indices for all five countries (Black et al., 2014a).

2.1. Brazil CGI as Illustrative Example

Brazil *CGI* (*BCGI*) is based on surveys distributed in 2004, 2006, and 2009 (for details, see Black, de Carvalho and Gorga, 2010). We exclude banks, government-controlled firms, and subsidiaries of foreign firms. We can measure *BCGI*, Tobin's *q*, and covariates for 170 firms, of which 72 answered two or more surveys. *BCGI* consists of six equally weighted subindices for Board Structure, Board Procedure,

Disclosure, Ownership Structure, Shareholder Rights, and Related-Party Transactions (RPTs), which reflect 41 governance elements. Most elements are binary ("1" if a firm has the attribute, "0" otherwise); we scale continuous elements to 0~1. Table 1 lists the elements of two key subindices – board structure (7 elements) and disclosure (11 elements). The expanded working paper covers other subindices and provides details on the elements and why we chose them.

Within each subindex, we weight each element equally, scale each subindex to run from 0~100, and compute *BCGI* as an average of the subindex scores. *BCGI* values range from 19.1 to 91.5 (mean = 62.1). Table 2 provides summary statistics for our governance indices. For regressions, we scale each subindex to mean 0, $\sigma = 1$, sum the subindices, and rescale the sum to mean 0, $\sigma = 1$. Rescaling makes the coefficients on country *CGI* comparable across countries. We use a similar approach for India, Korea, and Turkey. Table 1 indicates in which countries the element is used, and whether data on that element are available or "feasible" (available but only with substantial additional effort).

Russia. Russia is different and illustrates the challenges in building a multicountry governance index. We lack the data to build our own index, and rely instead on six indices developed by different sources (for details, see Black, Love, and Rachinsky, 2006). We are not able to build subindices comparable to the other countries, so we cannot include Russia in Pooled *CGI*.

Comparison to Developed Markets. Our country indices are very different from an index appropriate for a developed market. For example, the developed market indices focus on takeover defenses, which are irrelevant for firms with a controlling shareholder or group, as is the case for most of the firms our sample. *BCGI* shares only 3 common elements with the 24-element Gompers, Ishii and Metrick (2003) index, and only four elements with the 44-element Institutional Shareholder Services index (Aggarwal et al., 2009).

2.2. Commonalities and Differences across Countries

We sought to build country indices that cover similar aspects of governance, while, adapting our governance elements to the available data, rules, and norms of each country. We hope that we partly succeeded in building similar subindices. Yet individual governance elements turn out to differ greatly across countries. Of the 121 elements used (in one of Brazil, India, Korea, and Turkey), only 33 are used in two or more countries, eight in three countries, and none in all four of these countries.

An alternative approach would be to insist that each country index contain the same governance elements. If one also required that the elements be publicly available in all five countries, the resulting "Public Index" would have only three elements: one board structure element (audit committee exists) and two disclosure elements (firm has English language financials; financial statements include statement of cash flows). Moreover, only some elements would be relevant in particular countries. In India, audit

committees are required, all financials are in English, and must include a statement of cash flows. This leaves no useful public elements at all. Thus, this is not a feasible strategy.

One can improve on the Public Index by using the nonpublic data from our surveys, at the cost of building an index that does not cover all public firms and cannot be easily replicated. We use our survey data to build a "Common Index" for Brazil, India, Korea, and Turkey, consisting of elements which are available in all four countries and useful in at least two of these countries. This index includes 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. However, as we show below, the Common Index has little predictive value.

3. Methodology: Construct Validity and Endogeneity Concerns

3.1. Embracing Construct Validity

Prior multicountry studies have used the same governance index, with the same elements, in each country. Given our limited ability to build a meaningful common index, we adopt a different approach. We posit that there is an underlying, unobserved concept of "overall corporate governance", which induces the board and management to act to increase firm value, and that this concept can usefully be divided into unobserved "buckets" of board structure, board procedure, disclosure, ownership, shareholder rights, and RPT control; and that each bucket is composed of unobserved "aspects" of governance, such as *true* effectiveness of the board of directors; the audit committee (or a local substitute), and so on. Measuring corporate governance then involves developing measurable *constructs* – at the element, subindex, and overall index levels – that map decently onto unobserved true governance. That is, we are measuring constructs (elements) within larger constructs (subindices) within a still larger construct (overall country index). The mapping from constructs to underlying governance will depend on data availability and local rules and institutions. Both the observed and unobserved aspects of governance will differ across countries; thus, the elements we use to capture them must vary as well.

Also, we are interested in assessing whether a within-country *change* in governance predicts a change in Tobin's *q*, or another outcome variable, in a panel data setting. Governance *levels* also vary greatly across countries. Only elements with meaningful variation, both across firms and across time within firms, are useful. Those elements also vary substantially across countries. In particular, in each country, we cannot study elements that are required by law or otherwise universal or nearly so.

How will we know whether we have chosen sensible constructs – whether, say, Brazil and Turkey *CGI* measure similar things? A null result could mean either that governance does not affect Tobin's *q* or that we have built a poor construct. A result in some countries (but not others) could mean that governance only matters in those countries or that we have better constructs in those countries. But if we find a positive

association across countries, with a reasonably strong research design (say firm fixed effects with extensive covariates), this provides evidence both that governance predicts Tobin's *q* and that our country-specific constructs do a decent job of measuring governance.

3.2. Model Specifications

Our principal outcome variable is Tobin's *q*, which is a common outcome in "governance-to-value" studies such as ours. To reduce the influence of high-*q* outliers, we use the natural logarithm of *q* and then exclude outliers, for which studentized residual from regressing the natural logarithm of Tobin's *q* (below, *ln*(*q*)) on country *CGI* (year-by-year) > |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.

Prior multicountry studies use cross-sectional data. We seek to improve on this specification by using panel data and RE or FE specifications. We use an unbalanced panel, with standard errors clustered on firm. RE and FE are well-known models, we review here aspects that are relevant for our study. A general firm effects model is (Wooldridge, 2010, § 10.2):

$$\ln(q_{i,t}) = \beta_0 + \beta_1 \times (\text{country } CGI)_{i,t} + \boldsymbol{\beta}_2 \times \mathbf{x}_{i,t} + g_t + f_i + \varepsilon_{i,t} \qquad (1)$$

Here $\mathbf{x}_{i,t}$ is a vector of covariates, which we assume to be exogenous, g_t are year dummies and f_i are firm effects. Exogeneity requires, among other things that current country *CGI* does not influence future **x**'s. This is unlikely to be strictly true, but may be a reasonable approximation. First, prior studies find that firm characteristics only weakly predict *CGI*.[4] Bhargava and Sargan (1983) suggest that assuming exogeneity is more reasonable if one uses RE or FE to address unobserved heterogeneity, has a "short" time dimension, and a time-persistent variable of interest. Both FE and RE will be inconsistent if there are omitted time-varying firm covariates that are correlated with both *CGI* and Tobin's *q*.

The FE model can be seen as a "time-demeaned" specification. Let $\mathbf{x}_{i,t}^{dm} = (\mathbf{x}_{i,t} - \overline{\mathbf{x}}_i)$, and similar for other variables. The FE model is:

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

The FE estimator is consistent even if the firm effects are correlated with country *CGI* and other covariates. However, FE requires at least two observations of each firm; this imposes a substantial loss of sample size in Brazil (only 72 of 159 firms appear twice) and India (186 of 399 appear twice). We indicate loss of effective sample size below by reporting FE sample size excluding firms that appear only once. FE estimates also rely only on within-firm variation. This reduces power. Governance often changes slowly over time, so the loss of power can be substantial. One also cannot use FE to study aspects of governance with little time variation, notably ownership structure.

The RE model makes a "strict exogeneity" assumption; one form of this assumption is that the firm effects are uncorrelated with the covariates in all time periods: $\text{Cov}(f_i, x_{i,t}) = 0 \ \forall \ t$. RE leads to a "quasi-demeaned" feasible GLS estimate. Let σ_ε and σ_f be the standard deviations of $\varepsilon_{i,t}$ and f_i, T be the number of periods, and define:

$$\lambda = 1 - \frac{\sigma_\varepsilon}{\sqrt{\sigma_\varepsilon^2 + T * \sigma_f^2}}$$

and quasi-demeaned variables $\mathbf{x}_{i,t}^{qdm} = (\mathbf{x}_{i,t} - \lambda * \overline{\mathbf{x}}_i)$ and similar for other variables. The RE model is:

$$\ln(q_{i,t})^{qdm} = \beta_1 \times (\text{country } CGI)_{i,t}^{qdm} + \boldsymbol{\beta}_2 \times \mathbf{x}_{i,t}^{qdm} + g_t^{qdm} + f_i^{qdm} + \varepsilon_{i,t}^{qdm} \qquad (3)$$

Strict exogeneity is unlikely to be satisfied in governance studies. Thus, given sufficient time variation in governance, FE is ordinarily preferred because one avoids the need for this assumption. However, RE has greater power, due to larger effective sample size and ability to exploit both within-firm and across-firm variation. Also, the RE estimator converges to the FE estimator as λ approaches 1. Thus, the additional bias of RE estimates, relative to FE, should be limited if λ is close to 1.

We see both RE and FE as useful specifications for governance studies, with different strengths, and therefore report both below. For stronger identification, one would need a "quasi-experimental" design with an exogenous shock to governance. This design is not realistically available for a multicountry study.[5] With a longer, balanced panel, it could be valuable to use a dynamic auto-regressive RE model, following Bhargava and Sargan (1983) and Bhargava (2010). For a time-persistent variable such as governance, Bhargava's (2010) results for dividends suggest that a static model may understate long-term impact.

3.3. Covariates and Omitted Variable Bias

We use extensive covariates to reduce omitted variable bias. We use the following covariates, summarized in Table 2, the expanded working paper provides details. *Firm size:* natural logarithm of assets to control for the effect of firm size on Tobin's *q*; *Firm age*: natural logarithm of (years listed +1), because younger firms are likely to be faster-growing and more intangible asset-intensive, which can lead to higher Tobin's *q*; *Leverage*: total liabilities/total assets, because leverage can influence Tobin's *q* by affecting income tax and reducing free cash flow problems, and is mechanically related to Tobin's *q*. *Growth prospects and profitability,* which directly predict Tobin's *q*. We control for geometric sales growth over the last 3 years, and for profitability using both net income/assets and *EBIT*/sales. *Capital intensity and asset tangibility:* Asset tangibility can both predict Tobin's *q* and affect what type of governance a firm needs. We control for PPE/sales, capex/PPE, R&D/sales, and advertising/sales. *Liquidity*: annual share turnover (traded shares/total shares) and free float, since share prices may be higher for firms with more liquid shares. *Ownership*: fractional ownership by the largest shareholder, foreign investors, and the

state. *Product market competition*, which can directly affect value and substitute for governance in imposing discipline on managers: exports/sales and domestic market share in the firm's principal industry. With RE, we also use several firm-level variables which can predict both governance and *q*: *Industry dummies*, defined separately in each country (9 dummies for Brazil, 11 for India, 4-digit Korean SIC codes for Korea, and 2-digit US-equivalent SIC codes for Turkey). *US cross-listing dummy* and *MSCI index dummy* to proxy for liquidity and foreign investor interest. *Business group dummy,* because group firms may behave differently than stand-alone firms.

4. Country-Level Results

4.1. RE and FE Results

In Table 3, we examine whether country *CGI* predicts Tobin's *q*, using RE and FE specifications. We focus on results for overall country indices; we study subindices separately (Black et al., 2014b). With RE, country *CGI* is a statistically significant predictor of higher Tobin's *q*, in each country. With FE, the coefficients on country *CGI* drop in all countries except India, but remain positive in all countries and statistically significant in all countries but Brazil. The FE coefficients are economically important and have plausible magnitudes -- they range from 0.044 (Korea) to 0.079 (India). Since country *CGI* is scaled to σ=1 and the dependent variable is a natural logarithm, these coefficients imply that a one-standard-deviation increase in country *CGI* predicts from 4.5 to 8.2% higher Tobin's *q*.

A Breusch-Pagan test (not reported) strongly rejects the absence of firm effects, and implies that pooled OLS results will be inconsistent. We also report tests for equivalence of FE and RE coefficients, using both the well-known Hausman test and the correlated random effects (CRE) model, which has advantages over the Hausman test (Wooldridge, 2013, § 14.3).[6] These tests reject the equivalence of RE and FE models for all coefficients together. For country *CGI* by itself, the CRE test rejects model equivalence only for Russia. Both tests assume exogenous **x**'s. Median λ, indicating whether RE results are closer to pooled OLS ($\lambda = 0$) or to FE ($\lambda = 1$), is only 0.29 in India and 0.33 in Brazil, but 0.64 or above in Korea, Russia, and Turkey, which suggests that RE is a reasonable specification in these countries.

Prior multicountry studies rely on cross-sectional OLS regressions. To assess the reliability of an OLS specification, we also conduct unreported pooled OLS regressions. We find large differences between pooled OLS results and the FE results in Table 3. The ratio of pooled OLS/FE coefficients on country *CGI* ranges from 0.55 (India) to 2.21 (Russia). FE coefficients tend to be lower (mean = 0.067) than pooled OLS (mean = 0.088); suggesting that pooled OLS estimates are likely to be upward biased. RE coefficients are usually intermediate between pooled OLS and FE (mean = 0.078). Intermediate RE coefficients, especially if λ values are not far from 1, suggest that RE coefficients are likely to be less inconsistent than pooled OLS. Still, the generally lower FE coefficients suggest that RE is likely to be upward biased.

4.2. Sensitivity of Results: Covariates, Outliers, and Clustering

In unreported results, we vary the FE specification in Table 3 to assess how choice of specification affects our results. First, we use a limited set of covariates, similar to those used by Durnev and Kim (2005) (below, "DK covariates"): natural logarithm of assets; R&D/sales (not available in Brazil); exports/sales (not available in Brazil); industry dummies; cross-listing dummy; and year dummies. Other multicountry studies also use very limited covariates. Coefficients and *t*-statistics rise in all countries, strongly so in India. The India coefficient increases from 0.079 to 0.086 and becomes strongly significant ($t = 2.69$). The tendency to find higher coefficients if we use more limited covariates increases as we move from FE to RE to pooled OLS. This suggests that results from prior multicountry studies likely have substantial upward bias.

In Table 3, we use *ln*(q) as our dependent variable and exclude outliers. If we include outliers (results not reported), the FE coefficient in India drops from 0.079 (t = 2.30) to a negligible 0.004. In Brazil, the coefficient drops from 0.074 to 0.041 (insignificant in both cases); changes in other countries are smaller. If we use *q* in levels as the dependent variable and exclude outliers (as in Durnev and Kim, 2005, and Klapper and Love, 2004), the coefficient on country *CGI* is significant only in Korea. Thus, how one defines the dependent variable and handles outliers can have a major impact on results.

It is common in corporate finance research with panel data to cluster standard errors on firm, as we do. However, errors could also be correlated within industry. With a large sample, one might simply cluster on industry instead of firm. For our study, the best clustering level is unclear, because the number of industry clusters is limited, ranging from 26 in Brazil to 48 in Korea. A rule of thumb is that clustered standard errors can be downward biased if the number of clusters drops much below 50 (Kezdi, 2004; Cameron, Gelbach, and Miller, 2008). As a robustness check, we report *t*-statistics for country *CGI* with industry clusters and the number of clusters, in separate rows, just underneath the *t*-statistics with firm clusters. With FE, *t*-statistics barely change in Brazil and Russia, and *rise* in Korea and Turkey, but fall in India, where *CGI* becomes only marginally significant.

5. Pooled Regressions across Countries

5.1. Results for Pooled CGI

We next pool observations across Brazil, India, Korea, and Turkey, treat the country *CGI* indices *as if* they capture the same underlying construct, and combine them into "Pooled *CGI.*" Russia *CGI* is too dissimilar from other country indices to permit pooling. Pooling can help to make sense of results in a many-country study; we also need to pool our results to compare them to other multicounty studies.

We report results for Pooled *CGI* in Table 4. We modify the regression specifications for Table 3 as follows. We use only covariates available in all four countries (we lose foreign ownership,

advertising/sales, R&D/sales, exports/sales, market share, and MSCI dummy). We convert country-specific industry dummies to 2-digit US-equivalent SIC codes. We interact the year and industry dummies and covariates with country dummies; this lets their impact vary across countries (country dummies are absorbed by the interactions between year dummies and country dummies). In effect, this allows a separate response surface for each country. For FE, we weight results from each country by 1/(number of firms), to give roughly equal weight to each country. Weights are not available for RE. Letting c index countries, d_c be country dummies, and suppressing the FE weights, the regression specification is:

$$\ln Q_{c,i,t} = \beta_0 + \beta_1 \times (\text{Pooled } CGI_{c,i,t}) + \boldsymbol{\beta}_2 \times \mathbf{x}_{c,i,t} \times d_c + f_i + (g_t \times d_c) + \varepsilon_{c,i,t} \quad (4)$$

In Table 4, consider first rows (1) (RE) and (2) (FE). In column (1), Pooled *CGI* is strongly significant in both specifications, with similar coefficients. This is expected given the single country results, and suggests that our country indices are capturing *something* about governance that affects firm market value. This *might* justify combining country indices that are similar at the subindex level, but different at the element level. In unreported results, we interact Pooled CGI with country dummies (omitting Korea) to check whether the coefficients on country *CGI* differ significantly across countries. The interaction terms are insignificant. An F-test (for FE) or χ^2 test (for RE) for joint significance also fails to reject the null of equal coefficients.

5.2. Common and Non-Common CGI Indices

We next use the 15 common elements (data available in all four countries, judged useful in at least two countries), to build country-level indices using common elements and pool these country-level indices to build the Common Index, following the same procedures as for country *CGI* and pooled *CGI*. In unreported regressions, the FE coefficients on country common indices are small and insignificant; the RE coefficient is significant only for Korea.

Table 4, column (2) provides results for Common Index. This index takes a positive coefficient with RE which is statistically significant, but economically modest at 0.014 (versus 0.062 for Pooled CGI). If we drop Korea, the coefficient becomes small and insignificant (coeff. = 0.006, $t = 0.33$). With FE, the coefficient on Common Index is small and insignificant (coeff. = 0.008; $t = 0.56$). Thus, the best common index we can build has little power to predict firm market value.

We next assess the relative power of the common and non-common governance elements to predict Tobin's *q*. We use two approaches. First, we build "Non-Common" country indices, composed of the *non-common* elements of the country *CGIs*, and then build Pooled Non-common *CGI*, based on these country-level indices. In column (3), we include Common Index and Pooled Non-Common *CGI* in the same regression, otherwise similar to eqn. (4). Pooled Non-Common *CGI* is statistically and economically strong across specifications. In contrast, the coefficient on Common Index is insignificant and close to zero in

both RE and FE. In effect, Common Index has no predictive power, separate from Non-Common *CGI*. Its modest power in column (2) instead reflects omitted variable bias, due to the 0.36 correlation between Common Index and Pooled Non-Common *CGI*.

In column (4), we assess the relative power of common and country-specific governance elements in a different manner. We include Common Index and Pooled *CGI* in the same regression. The coefficient on Common Index provides an estimate of the power of the part of Common Index that is orthogonal to Pooled *CGI* to predict Tobin's *q*, and similar for Pooled *CGI*. Pooled *CGI* remains economically and statistically strong, with coefficients similar to column 1, where it was included alone. In contrast, the coefficients on Common Index are negative in both RE and FE, and the RE coefficient is marginally significant. Taken together, the results in columns (3) and (4) provide strong evidence that what matters in corporate governance is captured principally by the non-common, country-specific elements, rather than the common ones.

As a robustness check, we report *t*-statistics clustered on industry interacted with country instead of the firm level, to allow for correlated errors across firms in the same industry and country. Focusing on FE, standard errors for Pooled CGI fall slightly in regression (1), but barely change in regression (4). In regression (1), the *t*-statistic for Pooled *CGI* remains strong at 5.62.

5.3. Sensitivity to Choice of Covariates

We noted above that country *CGI* results tend to strengthen if we use weaker covariates. We find a similar pattern for Pooled *CGI* – stronger covariates generally produce smaller coefficients. We provide an example in Table 4, row (3). Instead of interacting year dummies and covariates with country dummies, we include them in non-interacted form, following eqn. (2). This specification is closer to that used in prior studies. It assumes a single response surface for covariates across countries; in contrast, eqn. (4) allows country-specific surfaces. The coefficient on pooled *CGI* with FE rises from 0.62 to 0.81, suggesting the importance of allowing country-specific responses to covariates. In unreported results, the upward bias from using a common response surface rises as we change the specification from FE to RE to pooled OLS.

Although Common Index has no predictive power in Table 4 with FE, it would take a positive and statistically significant coefficient if we used limited covariates, similar to those in prior studies. For example, if we use the DK covariates, the coefficient on Common Index is 0.023 ($t = 2.73$). Our results with richer covariates suggest that these results are spurious, and reflect omitted variable bias.

5.4. Robustness of Prior Multicountry Studies

We revisit here three well-known multicountry studies, Klapper and Love (2004); Durnev and Kim (2005); and Dahya, Dimitrov and McConnell (2008), in light of the limited power we found for the Common Index, and evidence of upward bias in estimates that rely on limited covariates.[7] A first step is to

assess the results we would obtain using our Common Index, with a pure cross-sectional specification similar to theirs. We use 2001 for Korea (the first year when 1999 legal reforms were fully effective) and the first available year for other countries. In unreported results with DK covariates and country weights, the coefficient on Common Index is 0.043 (t = 3.12). However, this result weakens as we strengthen the covariates and move to pooled OLS and then RE, and vanishes entirely with FE. Thus, even a t-statistic above 3 does not ensure that cross-sectional results with limited covariates are reliable.

Klapper and Love (2004) report evidence that the Credit Lyonnais Securities Asia (CLSA) cross-country index for 2001 predicts higher Tobin's q and ROA, with t-values around 2.75. Durnev and Kim (2005) find that the CLSA index from 2001 and the S&P Transparency and Disclosure Index from 2000 predict higher Tobin's q, but weakly – with p-values of 0.06 for the CLSA index and 0.04 for S&P. Dahya, Dimitrov and McConnell (2008) study the association between board independence and market value, proxied by raw Tobin's q, for firms with a controlling shareholder. Their covariates are stronger than Klapper and Love or Durnev and Kim, but still limited. They report p-values with country fixed effects from [.02, .10]. The statistical significance of all of these results could easily vanish with a stronger specification. Dahya, Dimitrov and McConnell also report that their power comes, in significant part from India. In unreported regressions similar to those in Table 3 which include each subindex separately, we find an insignificant coefficient on India Board Structure Subindex. This suggests that omitted variable bias could explain their India results.

6. Sensitivity of Results to Omitted Variables

FE or RE with extensive covariates can reduce but not eliminate the potential for omitted variable bias. To assess the sensitivity of our results to unobserved covariates, we adapt to panel data two related approaches, one from statistics (Hosman, Hansen, and Holland, 2010; below HHH) and one from economics (Altonji, Elder, and Taber, 2005; Oster, 2013; below, ACT-O). Both approaches use the influence of known covariates on the coefficient of interest to provide bounds on that coefficient, if there are similarly influential but omitted covariates. This approach is credible only if one begins with a rich set of included covariates. We summarize the estimation procedures here; the expanded working paper includes further details.

Consider FE (eqn. (2)) and a single omitted covariate u, and let β_{long} (β_{short}) be the coefficient on *CGI* from a "long" ("short") regression of q on *CGI* which includes (excludes) u.

HHH show that the omitted variable bias from omitting u can be written as:

$$|\beta_{short} - \beta_{long}| = |\rho(q,u)_{\mathbf{x},CGI} \times [\text{s.e.}(\beta_{short}) * t_u]|. \qquad (5)$$

Here $\rho(a,u)_{\mathbf{b}}$ is the partial correlation between a and u, conditioned on covariates **b**; s.e.(x) is the standard error of x. We take absolute values since the principal concern is upward bias in $\beta_{1,short}$. They study cross-

sectional OLS, but their results carry through to FE. Eqn. (5) can be extended to multiple omitted variables with $F^{1/2}$ replacing *t*; see HHH and the expanded working paper for details.

The HHH idea is to assume that **u** (partially) predicts *CGI* as strongly (same *t*-statistic or, for multiple variables, same F-statistic) as the strongest included covariate (call this variable x_1) in a regression of CGI on all covariates, and then to make assumptions about plausible values of $\rho(q,\mathbf{u})_{\mathbf{x},CGI}$. HHH suggest values from 0.01-0.10. An alternate approach, followed here, is to assume that $\rho(q,\mathbf{u})_{\mathbf{x},CGI}$ = largest value of $\rho(q,x_2)_{(\text{rest of } \mathbf{x}),CGI}$ for any included covariate x_2 (which may be different than x_1).

In Table 5, row (1), we apply the HHH approach and report lower bounds ($\hat{\beta}_{lower}$) for the coefficient on governance using different assumptions about how the omitted covariates correlate with *CGI* and predict *q*.[8] Consider first pooled *CGI*. The covariate that most strongly predicts pooled *CGI* is state ownership (F for state ownership interacted with country dummies = 17.46), but (state ownership interacted with country dummies) weakly predicts Tobin's *q* (ρ =0.0097), so a similar omitted variable would barely affect the coefficient on pooled *CGI* (see col. (3)). The covariate that most strongly predicts *q* is leverage (ρ = 0.06**)** but (leverage interacted with country dummies) weakly predicts Pooled *CGI* (F = 0.87); a similar omitted variable would imply $\hat{\beta}_{lower} = 0.626$, only slightly less than the regression coefficient $\hat{\beta} = 0.0622$ (col. (4)). We consider in column (5) a single hypothetical omitted variable which has both: (i) the power to predict CGI of the variable (state ownership) which most strongly predicts *CGI* (F = 15.46); and (ii) the power to predict *q* of the variable (leverage) which most strongly predicts *q* (ρ = 0.06). This implies ($\hat{\beta}_{lower} = 0.0595$).

A particular concern with Tobin's *q* as an outcome variable in corporate governance research is that *q* is affected by growth opportunities, which are only partly observed. We therefore consider in column (6) the impact of omitted variables which predict CGI and *q* as strongly as *all* covariates that proxy for growth opportunities or intangible assets (sales growth, net income/assets, EBIT/sales, advertising/sales, and R&D/sales). This implies $\hat{\beta}_{lower} = 0.0607$. Finally, in column (7), if omitted variables predict *CGI* and q as strongly as *all* included covariates, this implies $\hat{\beta}_{lower} = 0.0518$ (*t* = 3.33). In short, the coefficient on Pooled *CGI* is not very sensitive to included covariates, and thus is not likely to be sensitive to omitted variables.

The ACT-O approach begins with the difference between the coefficient $\hat{\beta}_{narrow}$ from a limited regression that includes only clearly exogenous covariates (in our FE model, only the year effects) (coefficients shown in Table 5, col., (1)) and the estimated $\hat{\beta} = 0.0594$. If omitted covariates would have the same effect on true β and R^2 as included covariates, a lower bound on the true coefficient is $\hat{\beta}_{lower} = \hat{\beta} - (|\widehat{\beta}_{narrow} - \hat{\beta}|$. Table 6, column (8) summarizes the results from this approach.[9] The ACT-O lower bound is similar in concept to the "all covariates" HHH lower bound.

Row (2) of Table 5 is similar to row (1), but uses covariates that are *not* interacted with country dummies. The base coefficient estimate on Pooled *CGI* is now 0.083. Moreover, the lower bound estimates are now 0.081 (for HHH bounds) or 0.075 (for ACT-O bounds). These are *higher* than our base estimate with interacted covariates of 0.063. This reinforces the point that bounds estimates are credible only if one begins with robust covariates.

The remaining rows of Table 6 report lower bounds for country *CGI*. The "strongest" variable results in columns (2)-(4) are identical for India and Turkey because the same variable (state ownership) is the strongest predictor of both *CGI* and Tobin's *q*. Some individual country results are sensitive to potential omitted variables. For example, the HHH lower bound for India *CGI* in column (7) is 0.044 (t = 0.57), versus a base estimate of 0.079 (t = 2.30). The Korea, Turkey and Russia coefficients remain significant if we assume omitted covariates with the same strength as all included covariates (columns (7)-(8)). However, the Russia results are suspect because the available covariates are limited and statistical significance is only moderate (e.g., t = 2.34 in column (7)). At the same time, all of the lower bounds on country CGI are positive and economically meaningful (ranging from 0.044 to 0.078). Taken as a whole, the bounds exercise supports the power of country-specific indices to predict Tobin's *q*, but suggests the need to study a number of countries to obtain robust results.

7. Conclusion

The methodological goal of this article was to address the empirical challenges involved in cross-country assessments of what matters in corporate governance in emerging markets. The core challenges are construct validity; limited time-series data on governance; and endogeneity, principally omitted variable bias. We address these challenges by building country-specific indices, doing so over time, using extensive covariates, and applying both RE and FE methods. FE with extensive covariates and country-specific response surfaces is likely to be the best available research design, but will still be inconsistent if there are unobserved, time-varying covariates. We illustrate that sensitivity with a bounds analysis. An RE specification can also be useful, especially if the random effects λ is close to 1.

Our substantive goal was to assess whether firm-level variation in corporate governance predicts firm-level variation in market value across a representative sample of major emerging markets. We find that country-specific indices, tailored to local rules and institutions, have substantial predictive power. It may also be possible to pool country-level indices, which measure similar underlying concepts in country-specific ways, to develop meaningful cross-country measures of governance. In contrast, a "common" governance index, which relies on the same elements in each country, is hard to build, and has limited power to predict market value. A caveat: we study here whether corporate governance predicts firm market

value, not why. The channels through which governance affects market value are a fruitful area for future research.

References

Acock, A. C., 2013. Discovering Structural Equation Modeling Using Stata, Revised Edition. Stata Press.

Aggarwal, R., Erel, I., Stulz, R.M., Williamson, R., 2009. Differences in governance practices between U.S. and foreign firms: measurement, causes, and consequences. Rev. Financ. Stud. 22, 3131-3169.

Altonji, J.G., Elder, T.E., Taber, C.R., 2005. Selection on observed and unobserved variables: assessing the effectiveness of Catholic schools. J. Polit. Economy 113, 151-184.

Altonji, J.G., Conley, T., Elder, T.E., Taber, C.R., 2011. Methods for using selection on observed variables to address selection on unobserved variables. Working paper, at http://www.iza.org/conference_files/SPEAC2011/altonji_j46.pdf.

Ararat, M., Black, B., Yurtoglu, B., 2013. Corporate governance, business groups, and market value: time-series evidence from Turkey. Working paper, at http://ssrn.com/abstract=2277768.

Atanasov, V., Black, B., Ciccotello, C., Gyoshev, S., 2010. How does law affect finance? An examination of equity tunneling in Bulgaria. J. Financ. Econ. 96, 155-173.

Bae, K., Kang, J., Kim, J., 2002. Tunneling or value added? Evidence from mergers by Korean business groups. J. Finance 57, 2695-2740.

Balasubramanian, N., Black, B., Khanna, V., 2010. Firm-level corporate governance in emerging markets: A case study of India. Emerging Markets Review 11, 319-340.

Bebchuk, L.A., Hamdani, A., 2009. The elusive quest for global governance standards. University of Pennsylvania Law Review 157, 1263-1316.

Bennedsen, M., Nielsen, K.M., Nielsen, T.V., 2012. Private contracting and corporate governance: Evidence from the provision of tag-along rights in Brazil. Journal of Corporate Finance 18, 904-918.

Bertrand, M., Mehta, P., Mullainathan, S., 2002. Ferreting out tunneling: An application to Indian business groups. Quarterly Journal of Economics 117, 121-148.

Bhargava, A., 2010. An econometric analysis of dividends and share repurchases by US firms. J.R. Stat. Soc., Ser. A (Statistics in Society) 173, 631-656.

Bhargava, A., Sargan, J.D., 1983. Estimating dynamic random effects models from panel data covering short time periods. Econometrica 51, 1635–1660.

Black, B., de Carvalho, A.G., Gorga, E., 2010. Corporate governance in Brazil. Emerging Markets Review 11, 21-38.

Black, B., de Carvalho, A.G., Gorga, E.C.R., 2012. What matters and for which firms for corporate governance in emerging markets?: Evidence from Brazil (and other BRIK countries). Journal of Corporate Finance 18, 934-952.

Black, B., de Carvalho, A.G., Khanna, V., Kim, W., Yurtoglu, B., 2014a. Methods for multicountry studies of corporate governance: Evidence from the BRIKT countries. Expanded working paper, at http://ssrn.com/abstract=2359126.

Black, B., de Carvalho, A.G., Khanna, V., Kim, W., Yurtoglu, B., 2014b. What aspects of corporate governance predict firm value in emerging markets: Evidence from the BRIKT countries. Working paper, at http://ssrn.com/abstract=2227718.

Black, B., Jang, H., Kim, W., 2006a. Does corporate governance affect firms' market values? Evidence from Korea, Journal of Law, Economics and Organization 22, 366-413.

Black, B., Jang, H., Kim, W., 2006b. Predicting firms' governance choices: Evidence from Korea. Journal of Corporate Finance 12, 660-691.

Black, B., Khanna, V., 2007. Can corporate governance reforms increase firms' market values?: Event study evidence from India. Journal of Empirical Legal Studies 4, 749-796.

Black, B., Kim, W., 2012. The effect of board structure on firm value: A multiple identification strategies approach using Korean data. J. Financ. Econ. 104, 203-226.

Black, B., Love, I., Rachinsky, A., 2006. Corporate governance indices and firms' market values: time-series evidence from Russia. Emerging Markets Review 7, 361-379.

Brown, P., Beekes, W., Verhoeven, P., 2011. Corporate governance, accounting and finance: A review. Accounting and Finance 51, 96-172.

Cameron, A.C., Gelbach, J.B., Miller, D.L., 2008. Bootstrap-based improvements for inference with clustered errors. Rev. Econ. Stat. 90, 414-427.

Claessens, S., Djankov, S., Fan, J., Lang, L., 2002. Disentangling the incentive and entrenchment effects of large shareholdings. J. Finance 57, 2741-2771.

Claessens, S., Yurtoglu, B., 2013. Corporate governance in emerging markets: A survey. Emerging Markets Review 15, 1-33.

Dahya, J., Dimitrov, O., McConnell, J.J., 2008. Dominant shareholders, corporate boards, and corporate value: A cross-country analysis. J. Financ. Econ. 87, 73-100.

De Carvalho, A. G., Pennacchi, G.G., 2012. Can a stock exchange improve corporate behavior? Evidence from firms' migration to premium listings in Brazil. Journal of Corporate Finance 18, 883-903.

Doidge, C., Karolyi, G.A., Stulz, R.M., 2007. Why do countries matter so much for corporate governance. J. Financ. Econ. 86, 1-39.

Durnev, A., Kim, E.H., 2005. To steal or not to steal: firm attributes, legal environment, and valuation. J. Finance 60, 1461-1493.

Gompers, P., Ishii, J., Metrick, A., 2003. Corporate governance and equity prices. Quarterly Journal of Economics 118, 107-155.

Hosman, C.A., Hansen, B.B., Holland, P.W., 2010. The sensitivity of linear regression coefficients' confidence limits to the omission of a confounder. Annals of Applied Statistics 4, 849-870.

Kezdi, G., 2004. Robust standard error estimation in fixed-effects panel models. Hungarian Statistical Review 9, 95-116.

Khanna, T., Kogan, J., Palepu, K., 2006. Globalization and similarities in corporate governance: A cross-country analysis. Rev. Econ. Stat. 88, 69-90.

Klapper, L.F., Love, I., 2004. Corporate governance, investor protection and performance in emerging markets. Journal of Corporate Finance 10, 703-728.

Kline, P., 2000. Handbook of Psychological Testing, 2nd edition. Routledge, New York, NY.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 1997. Legal determinants of external finance. J. Finance 52, 1131-1150.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 1998. Law and finance. J. Polit. Econ. 106, 1113-1155.

Larcker, D.F., Rusticus, T.O., 2010. On the use of instrumental variables in accounting research. Journal of Accounting and Economics 49, 186-205.

Morey, M., Gottesman, A., Baker, E., Godridge, B., 2009. Does better corporate governance result in higher valuations in emerging markets? Another examination using a new data set. Journal of Banking and Finance 33, 254-262.

Roberts, M.R., Whited, T.M., 2013. Endogeneity in empirical corporate finance. In: Constantinides, G.M., Harris, M., Stulz, R.M. (Eds.), Handbook of the Economics of Finance, Vol. 2A. Elsevier, pp. 493-572.

OECD (Organisation for Economic Co-operation and Development), 2004. Principles of Corporate Governance. OECD, Paris, France.

Oster, E., 2013. Unobservable selection and coefficient stability: theory and validation. Working paper, at http://ssrn.com/abstract=2266720.

Petersen, M.A., 2009. Estimating standard errors in finance panel data sets: comparing approaches. Rev. Financ. Stud. 22, 435-480.

Shadish, W.R., Cook, T.D., Campbell, D.T., 2002. Experimental and Quasi-Experimental Designs for Generalized Causal Inference. Houghton Mifflin, Boston.

Wooldrige, J.M., 2010. Econometric Analysis of Cross Section and Panel Data, 2nd edition. MIT Press.

Wooldridge, J.M., 2013. Introductory Econometrics: A Modern Approach, 5th edition. South-Western Cengage Learning, Mason, Ohio.

World Bank, 2013. Doing Business 2013: Smarter Regulations for Small and Medium-Size Enterprises. World Bank, Washington, DC.

Table 1.
Elements of Board Structure and Disclosure subindices.

Elements	Brazil	India	Korea	Turkey	Common Index
Years	**2004, 06, 09**	**2006, 07, 12**	**1998-2004**	**2006-12**	
Board Structure Subindex					
≥ 1 outside director	X (NP)	required	required	X	X
> 1 outside director	avail (NP)			X	
≥ 30% outside directors	X (NP)	required	common	avail	X
≥ 50% outside directors	X (NP)	X	X	rare	
> 50% outside directors	rare (NP)	X	X	rare	X
CEO is board member	common (F)	common (F)	common (F)	X	
CEO is NOT board chairman	X	X	avail (NP)	X	X
Board has outside chair or lead director	NA	feas (NP)	X	rare	
≥ 50% outside directors **or** ≥ 1/3 outside directors & *and* CEO is not chairman	feas (NP)	X	avail (NP)	rare	
Firm has outside CEO	NA	feas	feas	X	--
Audit committee	X	required	X	required	X
Audit committee has non-executive chair	NA	feas (NP)	common (F)	X	
Audit committee has outside director	avail (NP)	feas (NP)	common (F)	X	
Audit committee has majority of outside directors	rare (NP)	X	X	NA	
Compensation committee	rare (NP)	X	X	NA	
Outside director nominating committee	rare (NP)	NA	X	NA	
Corporate governance committee	rare (NP)	NA	rare (F)	X	
Fiscal board exists	X (NP)	NM	NM	NM	
Permanent fiscal board **or** audit committee has minority shareholder representative	X (NP)	NM	NM	NM	
Disclosure Subindex					
RPTs are disclosed to shareholders	X (NP)	X	required	required	X
Firm has regular meetings with analysts	X (NP)	X	X (NP)	NA	
Firm discloses 5% holders	common	X	required	avail	X
Control group shareholder agreement disclosed	feas	X	NA	NA	
Annual financials on firm website	X	X	avail, NM	X	X
Quarterly financial statements are consolidated	X	feas	feas	required	
Quarterly financials on firm website	X	X	NA	X	
Firm puts annual report on firm website	NA	X	NA	X	
Directors' report on firm website	NM	X	NM	NM	
Corp governance report on firm website	NM	X	NM	X	
Firm discloses material events on firm website	NA	NA	NA	X	
Firm discloses annual agenda of corporate events	X	NA	required	X	
Firm charter available on firm website	NA	NA	NM	X	
English language financial statements exist	X	NM	X (NP)	X	X
Financials include statement of cash flows	X	required	required	required	
Financial statements in IFRS or US GAAP	X	feas	rare	required	
MD&A discussion in financial statements	X	required	required	NA	
Shareholder voting information on firm website	NA	NA	NA	X	
Firm discloses list of insiders	NA	NA	NA	X	
Firm discloses director shareholdings	NA	feas (NA)	required	X	
Controlling shareholder disclosed				X	
Code of conduct/ethics contents disclosed				X	
Governance charter or guidelines disclosed	NA	avail (NP)	NA	X	
Annual meeting results disclosed	required	NA	required	X	
Board members' roles/employment disclosed	avail	NA	required	X	
Board members' background disclosed	avail	NA	X	X	
Board members date of joining board disclosed	feas	NA	required	X	
Background of senior managers disclosed	avail	NA	NA	X	
Information re internal audit/control disclosed	NA	NA	required	X	

Elements	Brazil	India	Korea	Turkey	Common Index
Number of board meetings disclosed	avail (NP)	feas (NP)	required	X	
Board resolutions disclosed	NA	NA	required	X	
Executive director compensation disclosed	NA	NA	required	X	
Auditor does not provide non-audit services	X (NP)	X	feas	NA	
Non-audit fees < 25% of total auditor fees	NA	X	feas	NA	
Full board reviews auditor's recommendations	NA	X	NA	NA	
Audit partner is rotated every 5 years	NM	X	feas	NA	

Notes on cell entries: X = element used; avail = not used, but data is available; (feas or F) = data could be collected with substantial effort; NA = data not available; NP = data from private survey; not publicly available; NM = not meaningful; required = required by law; rare = avail but rare; common = avail but nearly universal.

Table 2
Definitions and summary data for principal variables.

	Definitions	Mean	Std. Dev.	Min	Max
BCGI	Brazil Corporate Governance Index	62.1	15.4	19.1	91.5
ICGI	India Corporate Governance Index	59.2	10.8	24.6	86.9
KCGI	Korea Corporate Governance Index	33.9	11	7.9	88.3
RCGI	Russia Corporate Governance Index (normalized)	0	1	-2.9	3.51
TCGI	Turkey Corporate Governance Index	54.3	16.4	11.6	96.5
Pooled *CGI*	Pooled Corporate Governance Index (normalized)	0	1	-2.98	5.21
Common Index	Index of 15 elements available in Brazil, India, Korea and Turkey (normalized)	0	1	-3.6	5.56
Pooled Non-common *CGI*	Pooled *CGI*, excluding elements of Common Index (normalized)	0	1	-2.32	3.69
Tobin's *q*	(book value of debt + market value of common stock)/ book value of assets	1.14	1.11	0.23	32.87
ln (assets)	natural logarithm of book value of assets	10.59	5.32	3.34	25.34
ln (listed years)	natural logarithm of (years since public listing + 1) India: Use years since incorporation	3.12	1.77	0.00	7.60
Leverage*	(Total liabilities)/assets. India: Use total debt.	0.50	0.24	0.00	3.33
Net Income/assets**	Ratio of net income over assets	0.03	0.10	-0.69	0.46
EBIT/sales**	Earnings before interest and tax (EBIT)/total sales	0.09	0.52	-2.62	14.24
3-yr sales growth**	Geometric average sales growth during past three years (or available period if less)	0.11	0.28	-0.73	2.30
PPE/sales*	Ratio of property, plant, and equipment (PPE) to sales	0.52	1.06	0.00	22.88
Share turnover*	(shares traded in year *t*)/(shares outstanding), adjusted for share issuances and splits	3.21	5.12	0.00	32.77
Inside ownership	Fractional ownership of common (and equivalent) shares by largest shareholder	0.31	0.23	0.00	1.00
Foreign ownership	Fractional ownership by foreigners	0.07	0.12	0.00	0.94
State ownership	Fractional ownership by the state	0.01	0.04	0.00	0.49
Free Float	Fraction of shares floating on the stock exchange (excludes shares held by insiders)	0.61	0.22	0.02	1.00
Capex/PPE*	Ratio of capital expenditures to PPE	0.13	0.15	0.00	0.97
R&D/sales*	Ratio of R&D expenditures to total sales	0.01	0.11	0.00	7.69
Advertising/sales*	Ratio of advertising expense to total sales	0.02	0.71	0.00	0.10
Exports/sales*	Ratio of export revenue to total sales	0.24	0.29	0.00	0.99
Market share	Firm's share of sales by all public firms in same industry	0.09	0.19	0.00	1.00
Business group	1 if firm belongs to business group in year *t*, 0 otherwise.	0.35	0.48	0.00	1.00
MSCI	1 if firm belongs to Morgan Stanley Capital International Index (MSCI)	0.10	0.30	0.00	1.00
US cross listing	1 if cross-listed in US (any level) in year *t*, 0 otherwise	0.06	0.25	0.00	1.00
industry dummies	country specific; mapped to US 2-digit SIC codes	n.m.	n.m.	n.m	n.m.

Notes. Income statement (balance sheet) amounts are measured for each year *t* (at end of year *t*). * = winsorized at 99% (** = also winsorized at 1%) in Table 6.

Table 3
Country-level regressions with firm random effects (RE) and fixed effects (FE).

Dependent Variable	ln(Tobin's *q*); outliers excluded									
Country (years)	Brazil (2004-2009)		India (2006-2012)		Korea (1998-2004)		Turkey (2006-2012)		Russia (1999-2005)	
Method	RE	FE	RE	FE	RE	FE	RE	FE	RE	FE
normalized Country *CGI*	**0.112*****	0.074	**0.066*****	**0.079****	**0.048*****	**0.044*****	**0.073*****	**0.074*****	**0.094*****	**0.067*****
	(2.97)	(0.95)	**(2.63)**	**(2.30)**	**(6.28)**	**(5.17)**	**(3.17)**	**(3.00)**	**(6.22)**	**(2.75)**
(w. industry clusters)	**(2.91)*****	(0.95)	(1.86)*	(1.71)*	**(6.86)*****	**(7.80)*****	**(4.39)*****	**(4.14)*****	**(4.60)*****	**(2.64)*****
No. of industry clusters	38	26	32	29	48	47	35	35	49	49
Ln (Assets)	**-0.050****	**-0.345*****	0.035	**-0.385*****	**-0.047*****	**-0.053*****	**-0.124*****	**-0.218*****	**-0.131*****	**-0.226*****
	(-2.30)	**(-3.95)**	(0.98)	**(-3.73)**	**(-6.49)**	**(-3.59)**	**(-5.59)**	**(-4.43)**	**(-5.75)**	**(-4.79)**
Years Listed	**-0.139*****	**-0.381****	-2.890	**26.680*****	**-0.076*****	**-0.145*****	**-0.052**	**-0.121****		
	(-3.62)	**(-2.31)**	(-1.04)	**(2.96)**	**(-8.90)**	**(-4.90)**	**(-1.31)**	**(-2.23)**		
Leverage	**0.353*****	-0.228	**-0.652*****	0.492	**0.741*****	**0.734*****	**0.703*****	**0.811*****	**0.453*****	**0.375****
	(5.80)	(-0.72)	**(-2.85)**	(1.28)	**(22.46)**	**(17.59)**	**(6.62)**	**(5.54)**	**(3.89)**	**(2.30)**
Net income/assets	0.342	-1.031*	**1.622****	1.128	**0.142*****	**0.149*****	**0.463*****	**0.380*****	**0.787*****	0.359
	(1.38)	(-1.95)	**(2.05)**	(1.34)	**(3.80)**	**(3.88)**	**(3.44)**	**(2.69)**	**(2.87)**	(1.30)
EBIT/sales	**0.006*****	0.727	-0.000	0.013	**-0.006****	**-0.009****	-0.016	-0.048		
	(3.19)	(1.22)	(-0.58)	(0.40)	**(-1.98)**	**(-2.21)**	(-1.26)	(-0.56)		
Sales growth	0.039	0.197**	**0.427*****	0.157	-0.000	**-0.000*****	**0.180****	**0.185****	**0.190*****	**0.248*****
	(0.76)	(2.44)	**(3.28)**	(0.74)	(-1.25)	**(-2.63)**	**(2.24)**	**(2.25)**	**(3.16)**	**(3.76)**
PPE/sales	-0.014	0.039	**0.001*****	0.001	**-0.011****	**-0.014****	0.011	0.018		
	(-1.25)	(1.06)	**(5.14)**	(0.24)	**(-2.07)**	**(-2.52)**	(1.40)	(1.44)		
Share turnover	0.031	0.052	**0.464*****	**0.744*****	**0.005*****	**0.005*****	0.012	0.016*	-1.503*	-1.498*
	(0.80)	(1.15)	**(3.64)**	**(3.27)**	**(6.78)**	**(6.62)**	(1.08)	(1.70)	(-1.95)	(-1.67)
Inside ownership	0.007	0.260			**-0.187*****	**-0.175*****	0.204	0.341		
	(0.08)	(1.32)			**(-3.93)**	**(-2.66)**	(1.20)	(1.12)		
Foreign ownership			**1.221*****	**2.632*****	**0.465*****	**0.447*****	**-0.576*****	**-0.709*****		
			(3.52)	**(3.78)**	**(7.64)**	**(6.52)**	**(-2.64)**	**(-2.97)**		
State ownership	0.028	**-2.485*****	0.003	**-34.874*****	0.143	0.210*	**0.430****	**0.740*****		
	(0.09)	**(-3.56)**	(0.00)	**(-4.96)**	(1.55)	(1.93)	**(2.35)**	**(7.21)**		
Free Float					-0.139***	-0.173***	-0.002	-0.001		
					(-3.32)	(-3.27)	(-1.47)	(-0.79)		

Dependent Variable	ln(Tobin's *q*); outliers excluded									
Country (years)	Brazil (2004-2009)		India (2006-2012)		Korea (1998-2004)		Turkey (2006-2012)		Russia (1999-2005)	
Method	RE	FE	RE	FE	RE	FE	RE	FE	RE	FE
Capex/PPE			-0.000	-0.000	**0.094*** **	**0.070*** **	**0.004** **	0.002		
			(-0.12)	(-0.85)	**(3.98)**	**(3.09)**	**(2.35)**	(0.73)		
R&D/sales			3.825*	-0.440	**0.030*** **	**0.024*** **	0.088	0.234		
			(1.67)	(-0.07)	**(5.97)**	**(3.18)**	(0.32)	(1.03)		
Advertising/sales			0.022	-0.786	**1.136*** **	0.978*				
			(0.68)	(-0.40)	**(2.61)**	(1.69)				
Exports/sales			-0.060	-0.005	**-0.052** **	-0.057*	-0.050	-0.051		
			(-0.48)	(-0.02)	**(-2.42)**	(-1.93)	(-0.43)	(-0.41)		
Market Share					**0.186*** **	**0.169** **	**0.436*** **	**0.738*** **		
					(2.78)	**(2.31)**	**(2.80)**	**(3.36)**		
Business group dummy			0.049	0.018	**0.036** **		0.088			
			(0.67)	(0.06)	**(2.17)**		(1.41)			
Cross-listing dummy	**0.202** **	-0.162	-0.121	**-0.846*** **	0.037	0.044	-0.014	-0.029		
	(2.45)	(-0.55)	(-1.30)	**(-2.69)**	(0.91)	(0.82)	(-0.34)	(-0.69)		
MSCI			0.183		**0.039** **	0.017	0.094	-0.073*	**0.375*** **	
			(1.19)		**(2.22)**	(0.91)	(1.20)	(-1.83)	**(5.20)**	
Russia RTS stock index									**0.343*** **	**0.362*** **
									(5.72)	**(5.90)**
constant, year dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	236	158	636	435	3,285	3,270	1,126	1,126	964	964
Number of firms	159	81	399	198	669	654	196	196	240	240
Hausman test (χ^2)	31.51(14) (*p*=0.0047)		n.a.		n.a.		123.28 (24) (*p*=0.0000)		n.a.	
CRE (F for all vars.)	73.73 (15) (*p*=0.0000)		48.34 (23) (*p*=0.0015)		1525.10 (72) (*p*=0.0000)		320.69 (24) (*p*=0.0000)		164.95 (33) (*p*=0.0000)	
CRE (t for CGI alone)	0.60		1.32		1.49		0.07		**2.44** **	
Median RE λ	0.33		0.29		0.64		0.72		0.71	
R^2	0.385	0.457	0.363	0.365	0.527	0.383	0.412	0.480	0.63	0.46

Notes. *t*-statistics with firm clusters (firm-index clusters in Russia)) in parentheses. R^2 is overall for RE; within for FE. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. Significant results (at 5% level or better) are in **boldface**.

Table 4
Pooled multicountry RE and FE regressions.

			Dependent variable	ln(Tobin's *q*), outliers excluded for each country-year					
				Separate		Included together		Included together	
				(1)	(2)	(3)		(4)	
	Models	**Covariates**		Pooled *CGI*	Common Index	Common Index	Pooled Non-common *CGI*	Common Index	Pooled *CGI*
(1)	RE (unweighted)	common covariates * country dummies; year * country dummies	Coefficient	**0.062*** **	**0.014** **	0.002	**0.087*** **	-0.012	**0.064*** **
				(6.67)	**(1.90)**	(0.23)	**(6.58)**	(-1.53)	**(6.31)**
			(w ind'y*country clusters)	**(5.62)**	(1.73)*	(0.22)	**(7.68)**	(1.68)	**(6.52)**
			CRE (F for all vars.)	219.77 (59)	187.70 (59)	190.91 (60)		191.63 (60)	
			CRE (*t* for *CGI* alone)	-0.21	1.18	0.49	1.15	0.74	-0.02
			Median RE λ	0.689	0.695	0.695		0.695	
			Overall R^2	0.54	0.55	0.56		0.56	
(2)	FE (weighted)	same as (1)	Coefficient	**0.063*** **	0.008	0.000	**0.079*** **	-0.011	**0.057*** **
				(3.86)	(0.56)	(0.00)	**(2.73)**	(-0.85)	**(3.28)**
			(w ind'y*country clusters)	**(3.13)**	(0.50)	(0.00)	**(2.84)**	(-0.88)	**(3.29)**
			Within R^2	0.43	0.42	0.43		0.44	
	Results with weaker covariates								
(3)	FE (weighted)	common covariates; year (not interacted w. country dummies	Coefficient	**0.081*** **	0.026*	0.016	**0.103*** **	-0.000	**0.075*** **
				(4.64)	(1.85)	(1.23)	**(3.01)**	(-0.02)	**(3.94)**
			Within R^2	0.35	0.33	0.35		0.36	

Notes. Indices are defined in text. Coefficients on covariates are suppressed. FE regressions use country weights = (1/no. of firms). All correlated random effects (CRE) p-values are 0.0000. *t*-statistics with firm (or, where indicated, industry*country clusters are in parentheses. No. of industry clusters = 154 for RE, 141 for FE, *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. Significant results (at 5% level or better) are in **boldface**.

Table 5.
Lower bounds on FE estimates for corporate governance indices.

Rows	Governance Index	Covariates	Narrow	Base	HHH Bounds Omitted variable based on					ACT–O Bounds
			(1)	(2)	(3) one covariate (strongly predicts q)	(4) one covariate (strongly predicts *CGI*)	(5) two covariates (strongly predict both)	(6) all growth and intangibles covariates	(7) all covariates	(8)
			$\hat{\beta}_{narrow}$	$\hat{\beta}$	$\hat{\beta}_{lower}$					$\hat{\beta}_{lower} - \lvert\hat{\beta}_{narrow} - \hat{\beta}\rvert$
(1)	Pooled *CGI*	common* country	**0.0594*** (5.26)**	**0.0633*** (3.86)**	**0.0626*** (3.81)**	**0.0622*** (3.79)**	**0.0595*** (3.63)**	**0.0607*** (3.70)**	**0.0518*** (3.15)**	**0.0594*** (3.62)**
(2)	Pooled *CGI*	common	**0.0906*** (5.26)**	**0.0829*** (4.81)**	**0.0828*** (4.80)**	**0.0816*** (4.73)**	**0.0809*** (4.69)**	**0.0822*** (4.76)**	**0.0802*** (4.65)**	**0.0752*** (4.36)**
(3)	Brazil *CGI*	country	0.0843 (1.07)	0.074 (0.95)	0.0723 (0.92)	0.0646 (0.8308)	0.0462 (0.59)	0.0630 (0.81)	0.0445 (0.57)	0.0637 (0.82)
(4)	India *CGI*	country	**0.0892*** (2.89)**	**0.0790** (2.30)**	**0.0782*** (2.27)**	**0.0782*** (2.27)**	**0.0782*** (2.27)**	**0.0782*** (2.27)**	0.0530 (1.54)	**0.0688*** (2.00)**
(5)	Korea *CGI*	country	**0.0452*** (4.99)**	**0.0448*** (5.33)**	**0.0439*** (5.22)**	**0.0423*** (5.02)**	**0.0369*** (4.38)**	**0.0447*** (5.32)**	**0.0372*** (4.42)**	**0.0444*** (5.28)**
(6)	Turkey *CGI*	country	**.0769*** (3.79)**	**0.0740** (3.00)**	**0.0714** (2.89)**	**0.0714** (2.89)**	**0.0714** (2.89)**	**0.0732** (2.97)**	**0.0527** (2.14)**	**0.0711*** (2.88)**
(7)	Russia *CGI*	country	**0.0645** (2.48)**	**0.0670*** (2.75)**	**0.0669*** (2.74)**	**0.0658*** (2.70)**	**0.0595*** (2.44)**	**0.0645*** (2.64)**	**0.0570*** (2.34)**	**0.0645** (2.65)**

Notes. Table presents Hosman, Hansen and Holland (2010) (HHH) and Altonji, Elder, Taber – Oster (ACT-O) lower bounds on FE estimates. Column (1) shows coefficients for pooled *CGI* and country *CGI*s from "narrow" FE regressions, for which the only covariates are year*country dummies (row (1) or year dummies (row (2)). Column (2) adds covariates. Columns (3)-(7) show HHH lower bounds on coefficient estimate under different assumptions about omitted covariates. Column (8) shows ACT-O lower bound. *t*-statistics (using standard errors from regressions in column (2) are in parentheses. *, **, and *** respectively indicate significance levels at 10%, 5%, and 1% levels. Significant results (at 5% level or better) are in **boldface**.

[1] Studies using this approach include Durnev and Kim (2005); Klapper and Love (2004); Dahya, Dimitrov, and McConnell (2008) (board independence); Doidge, Karolyi and Stulz (2007). We skip a literature review, and refer readers to the recent review by Claessens and Yurtoglu (2013); see also Black, de Carvalho and Gorga (2012); Brown, Beekes and Verhoeven (2011).

[2] BRIKT is a play on the World Bank's use of BRIC (Brazil, Russia, India, China) as key emerging markets. See http://en.wikipedia.org/wiki/BRIC. Some would add Turkey. We study Korea instead of China because the dominance of state-controlled firms in China means that generalizability is suspect. We also put aside studies of firm-level governance in developed markets, which raise different governance concerns (Bebchuk and Hamdani, 2009), and have less severe data constraints. We also do not address here how *country level* governance affects capital markets and economic performance. See, e.g., La Porta et al. (1997, 1998).

[3] This research complements our studies of individual countries. See, e.g., Black, de Carvalho and Gorga (2012); de Carvalho and Pennacchi (2012) (Brazil); Balasubramanian, Black and Khanna (2010); Black and Khanna (2007); (India); Black, Jang and Kim (2006a); Black and Kim (2012); (Korea); Black, Love and Rachinsky (2006) (Russia); Ararat, Black and Yurtoglu (2013) (Turkey)**.**

[4] See Black, Jang and Kim (2006b, Korea), Balasubramian, Black and Khanna (2010, India); Ararat, Black, and Yurtoglu (2014, Turkey)).

[5] We benefit from a shock to board structure in Korea during our sample period (see Black and Kim, 2012), but have no comparable shocks in other countries. Some studies address endogeneity by instrumenting for governance, Tobin's *q*, or both. We find the instruments unconvincing, and do not pursue this approach here (see Larcker and Rusticus, 2010; Roberts and Whited, 2012).

[6] The CRE model adds time-demeaned variables $\bar{\mathbf{x}}$ and $\overline{CGI}$ to the random effects model in eqn. (3). The coefficient and standard error on $\overline{CGI}$ provides a test of whether RE and FE coefficients on *CGI* are different; an F-test for all coefficients measures whether RE and FE as a whole produce different results. The advantages over the Hausman test are: (i) one can use clustered standard errors; (ii) one can test for different FE and RE coefficients both for CGI alone and for all coefficients together; (iii) in practice, the Hausman test often fails to run (for us, it fails in India and Russia).

[7] Our goal is to assess the robustness of results, not to criticize these articles. Klapper and Love (2004) and Durnev and Kim (2005) are also concerned as much with what predicts governance as with whether governance predicts firm market value.

[8] We use winsorized covariates. If we do not winsorize, then some covariates correlate strongly with pooled CGI. Winsorizing covariates has little effect on the coefficients on our country or Pooled *CGI* indices.

[9] ACT-O bounds assume that covariates will reduce β_1, and thus use $\hat{\beta}_1 - \hat{\beta}_{narrow}$ instead of $|\hat{\beta}_1 - \hat{\beta}_{narrow}|$.