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Black, Bernard and De Carvalho, Antonio Gledson and Khanna, Vikramaditya and Kim, Woochan and Yurtoglu, Burcin

Northwestern University, Law School and Kellogg School of Management, Fundacao Getulio Vargas School of Business at Sao Paulo, University of Michigan Law School, Korea University Business School, WHU - Otto Beisheim School of Management

March 2014

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

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

Abstract. We discuss empirical challenges in multicountry studies of the effect 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.

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

* We thank the *Journal of Econometrics* special editor, Alok Bhargava, two anonymous referees, Vladimir Atanasov, Stijn Claessens, Art Durnev, Zev Eigen, Howell Jackson and Louis Kaplow for comments and suggestions, 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) and WHU – Otto Beisheim School of Management for financial support for data collection. We are grateful to 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.

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" (a term we borrow from education and psychology, 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 is scarce. Often, data on particular governance elements is 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 at least random) effects, plus extensive covariates, to limit 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.

As an example of the limitations of a common index, consider an audit committee. These committees are often thought to be valuable. But we cannot measure their value in India or Turkey, where they are required, nor in Russia, where board committees are formally not permitted. We can learn little in Brazil, where many firms employ the substitute Brazilian institution of the "fiscal board." Our approach involves building a Brazil-specific board structure subindex that takes both institutions into account.

Having built country-specific 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. This 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] The RE coefficients are statistically significant in all five countries; the FE coefficients are significant except in Brazil. With FE, one-standard-deviation increase in country *CGI* predicts an economically meaningful, increase in *ln*(Tobin's q), ranging from .045 (Korea) to .089 (Brazil).

We then pool the indices for Brazil, India, Korea, and Turkey (we cannot use Russia when pooling), run multicountry FE and RE regressions, and find strong evidence that the resulting pooled governance index ("Pooled *CGI*") predicts Tobin's *q*. A one standard deviation increase in Pooled *CGI* predicts a .06-.07 increase in *ln*(Tobin's *q*). We also build a "Common Index" from the 15 elements that are available in all four countries and useful in at least two of them (we require elements to be useful in at least two countries because we seek to assess whether a common index can explain the relationship between governance and Tobin's *q across countries*). This index has weak predictive power with RE and none with FE. In regressions which include both the Common Index and a "non-common" index built

from the remaining elements, power to predict Tobin's *q* 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). Coefficients are also generally higher with fewer covariates. This suggests the need for research designs with FE (or at a minimum RE), plus extensive covariates. In multicountry studies that use regressions on pooled data across countries, it is also valuable to interact the covariates with country dummies, thus allowing for country-specific "response surfaces."

In any context in which omitted variable bias is likely to be important, it can be important to assess the sensitivity of estimates to potential omitted variables. We assess sensitivity 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 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 ISS index (e.g., Aggarwal et al., 2009), to the LLSV indices of anti-director rights and creditor rights (La Porta et al., 1997, 1998), and to 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 or many countries, and richer, country-specific measures with uncertain generalizability. There too: (i) country-specific indices, which seek to measure a common underlying concept in ways adapted to each country's circumstances, may outperform a common index; and (ii) a common index is subject to omitted variable bias, because the common index is likely correlated with omitted country-specific aspects of governance.

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. Section 7 concludes. 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). We focus here on results for overall country and pooled indices; we study which subindices predict firm market value in a separate project (Black et al., 2013b).

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 (2006-2011), 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.[4]

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., 2013a).

2.1. Brazil CGI as Illustrative Example

Brazil *CGI* (*BCGI*) is based on a survey distributed in 2004, 2006, and 2009 to all public firms (for details, see Black, de Carvalho and Gorga, 2010). We exclude banks, government-controlled firms, and subsidiaries of foreign firms. We are able to build *BCGI* and measure Tobin's *q* and covariates for 170 firms, but only 72 firms 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). The six subindices, in turn, reflect 41 elements. Most elements are dichotomous ("1" if a firm has the attribute, "0" otherwise); we normalize continuous variables to run from 0~1. Table 1 lists the elements of two key subindices – board structure and disclosure. The expanded working paper covers other subindices and provides details on our choice of elements.

Brazil Board Structure Subindex (7 elements). This subindex focuses on board independence and other aspects of board structure. Board independence is often seen as a core element of corporate governance (e.g., OECD, 2004; Dahya, Dimitrov and McConnell, 2008). An audit committee can help to ensure financial reporting integrity (e.g., Klein, 2002). In Brazil, the fiscal board often substitutes for the audit committee, so our governance index considers this institution as well. Only two of the seven elements are available from public data.

Brazil Disclosure Subindex (11 elements). This subindex focuses on financial disclosure, which is associated with higher Tobin's *q* (e.g., Durnev and Kim, 2005). We identify 11 disclosure elements, including whether the firm: prepares financial statements that meet international accounting standards;

prepares English language financial statements; provides specific financial disclosures, such as a statement of cash flows, that are common in other countries; posts financial statements on a company website; and discloses major shareholders and related party transactions (RPTs).

Computing BCGI and Subindices. Within each subindex, we weight each element equally, then reweight so each subindex runs from 0~100. *BCGI* is 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 rescale *BCGI* as follows: we scale each subindex to mean 0, $\sigma = 1$, sum the scaled subindices, and rescale the sum to mean 0, $\sigma = 1$. Rescaling makes the coefficients on country *CGI* reasonably comparable across countries.

India, Korea, and Turkey. Our approach to building country *CGI* is similar for India, Korea, and Turkey. For each element in these four countries, Table 1 indicates in which countries the element is used, and whether data on that element is 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 omit Russia from Table 1 due to limited overlap between the governance elements available there and those available in the other countries. The Russian indices do not let us build subindices that are comparable to the other four 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 Gompers, Ishii and Metrick (2003) "GIM" index focuses 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 (classified board of directors, dual-class common stock, and take-out rights) with the 24-element GIM index, and only four elements with the 44-element Institutional Shareholder Services index (see Aggarwal et al., 2009).

2.2. Commonalities and Differences across Countries

We seek to maintain common subindices and elements where feasible, but adapt our indices to each country. For example, 18 of the 41 Brazil elements are unique to Brazil. The full version of Table 1, which lists all elements in each country, is highly complex. Further complexity is buried in dozens of decisions on how elements should be defined and coded. In that complexity lies a central message of this article. We sought to build indices that cover similar aspects of governance in each country. At the subindex, we hope that we more-or-less succeeded. Individual elements, however, 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.

Suppose that we were to build a "Public Index", using elements that are publicly available in all five countries. That 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 of these 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.

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 this data to build a "Common Index" consisting of elements which are available in Brazil, India, Korea, and Turkey, and are useful in at least two of these countries This index includes 15 elements: 5 in board structure, 4 in disclosure, 2 each in 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. We show below that 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 across countries. Given the severe constraints on our 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 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 on local rules and institutions. Both the observed and unobserved aspects of governance will differ across countries; thus, the elements and subindices we construct 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* vary greatly across countries, reflecting a mix of local rules and practices. Only elements with meaningful variation,

both across firms and across time within firms, are useful for that purpose. Those elements will also vary substantially across countries.

How will we know whether we have chosen sensible constructs – whether, say, the Brazil *CGI* and Turkey *CGI* constructs measure similar things? A null result could mean either that governance does not affect Tobin's *q* or that we have 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 take logs and then exclude outliers, for which studentized residual from regressing *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. We run RE and FE regressions in each country using an unbalanced panel, with standard errors clustered on firm. These are well-known models, we review here aspects that are relevant for our study. A general firm effects model is:

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

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*.[5] Bhargava and Sargan (1983) suggest that assuming exogeneity is more reasonable if one uses RE or FE to address unobserved time-invariant heterogeneity, has a "short" time dimension, and a time-persistent variable of interest.

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:

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

The FE estimator is unbiased even if the firm effects are correlated with country *CGI*. 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 this below by reporting FE sample size excluding firms that appear only once. FE estimates also rely only on within-firm variation. This reduces power and prevents one from studying 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:

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

Strict exogeneity is unlikely to be satisfied in governance studies. 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. One may hope that the bias of RE estimates, relative to FE, will be limited if λ is close to 1.

We see both RE and FE as useful specifications, with different strengths. 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.[6] 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

FE and RE will be biased if unobserved time-varying covariates $\mathbf{u}_{i,t}$ are correlated with both country *CGI* and Tobin's *q* (e.g., Wintoki, Linck, and Netter, 2012). 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:* *ln*(assets) to control for the effect of firm size on Tobin's *q*; *Firm age*: *ln*(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. 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 0.045 (Korea) to 0.089 (Brazil). Since country *CGI* is scaled to σ=1 and the dependent variable is in logs, these coefficients imply that a one-standard-deviation increase in country *CGI* predicts from 4.6 to 9.3% higher Tobin's *q*.

A Breusch-Pagan test strongly rejects the absence of firm effects, and implies that pooled OLS results will be biased. 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).[7] 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 0.30 in India and 0.33 in Brazil, but is above 0.60 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 0.49 (India) to 2.21 (Russia). FE coefficients tend to be lower (mean = 0.066)

than pooled OLS (mean = 0.083); suggesting that pooled OLS estimates are likely to be upward biased. RE coefficients are usually intermediate between pooled OLS and FE (mean = .077). Intermediate RE coefficients, especially if λ values are not far from 1, suggest that RE is likely to be less biased than pooled OLS.

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"): *ln*(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 Brazil and Turkey. The Brazil coefficient nearly doubles from 0.088 to 0.162 and goes from insignificant (t = 1.15) to strongly significant (t = 3.79). The Turkey coefficient rises from 0.055 (t = 2.06) to 0.077 (t = 2.70). 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, the FE coefficient in India drops from .075 (t = 2.27) to a negligible .003. In Brazil, the coefficient drops from .088 to .052 (insignificant in both cases); in Turkey, the coefficient rises from .055 to .068. 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 (e.g., Petersen, 2009). 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 16 in Russia to 48 in Korea. A rule of thumb is that clustering can become unreliable if the number of clusters drops much below 50. We nonetheless use industry clusters as a robustness check. In Table 3, we report *t*-statistics for country *CGI,* and the number of clusters, in separate rows, just underneath the *t*-statistics with firm clusters. With FE, *t*-statistics barely change in Brazil, Turkey, and Russia, and *rise* in Korea, but India *CGI* becomes only marginally significant. RE standard errors are somewhat more sensitive to clustering level, but the RE coefficients remains significant except in India, where they become marginally significant. Thus, varying the clustering level can be a useful robustness check on standard errors.

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. We are agnostic on the value added by pooling, but note that: (i) pooling can help to make sense of results in a many-country study; and (ii) we 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, and market share; with RE we also lose 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 will be absorbed by the year * country interactions). 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:

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

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 *CGI**country dummy 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 0.015 (versus 0.067 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. = 0.005; $t = 0.32$). 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 at the industry*country level 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 increase moderately in regression (1), but barely change in regression (4). In regression (1), the *t*-statistic for Pooled *CGI* remains strong at 3.17.

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 0.63 to 0.83, 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.

In unreported results, if we further limit the set of covariates, Common Index becomes positive and statistically significant with both RE and FE. For example, if we use FE, a single response surface, and the limited set of DK covariates, Common Index becomes positive and significant (coeff. = 0.023, t = 2.71). Common Index remains marginally significant (coeff. = .016, t = 1.86) if it is included together with Pooled Non-Common *CGI*, although still near zero if included together with Pooled CGI (coeff. = -0.001). 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.[8] 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 Analyses

6.1. 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; Altonji et al., 2011; Oster, 2013; below, ACET-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. These bounds have not been used in prior governance research. We summarize the estimation procedures here; the expanded working paper includes further details.[9]

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*. A standard econometric result for an omitted variable u is:

$$|\beta_{short} - \beta_{long}| = |\rho(q,u)_{\mathbf{x},CGI} * \rho(CGI,u)_{\mathbf{x}}| \qquad (5)$$

Here $\rho(a,u)_{\mathbf{b}}$ is the partial correlation between a and u, conditioned on a vector of covariates **b**,[10] and we take absolute values for convenience, since the signs of the partial correlation coefficients are not known, and the principal concern is upward bias in $\beta_{1,short}$. HHH show that (5) can be rewritten as:

$$|\beta_{short} - \beta_{long}| = |\rho(q,u)_{\mathbf{x},CGI} * [\text{s.e.}(\beta_{short}) * t_u]|. \qquad (6)$$

Here se(x) is the standard error of x. Eqn. (6) can be generalized to allow multiple omitted variables **u.** Let R^2_{short} (R^2_{long}) be from a short (long) regression that omits (includes) **u**, let **u** be of rank k, let df be the short regression degrees of freedom, let $F_{\mathbf{u}}$ be the F-statistic for **u** from the long regression, define $t_{\mathbf{u}}$ as the positive square root of $F_{\mathbf{u}}$ with a degrees of freedom correction $t_{\mathbf{u}} = \{F_{\mathbf{u}} * [(k*df)/(df+1-k)]\}^{1/2}$ and define $\rho^2(a,\mathbf{u})_{\mathbf{b}}$ as the fractional decrease in unexplained variance from adding **u** to the regression:

$$\rho^2(a,\mathbf{u})_{\mathbf{b}} = \frac{(1-R^2_{\text{short}}) - (1-R^2_{\text{long}})}{(1-R^2_{\text{short}})} \qquad (7)$$

Then equation (6) remains valid for vector **u**. They study cross-sectional OLS, but their results carry through to FE.

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 .01-.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 β_{lower} for the coefficient on governance using different assumptions about how the omitted covariates correlate with *CGI* and predict q.[11] Consider first pooled *CGI*. The covariate that most strongly predicts pooled *CGI* is state ownership (F for state ownership * country dummies = 15.46), but (state ownership * country dummies) weakly predicts Tobin's q (ρ =.0025), 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 *country dummies) weakly predicts Pooled *CGI* (F = 0.87); a similar omitted variable would imply $\beta_{lower} = 0.620$, only slightly less than the regression coefficient $\hat{\beta} = 0.0629$ (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 $\beta_{lower} = 0.0579$.

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 $\beta_{lower} = 0.0613$. Finally, in column (7), if omitted variables predict *CGI* and q as strongly as *all* included covariates, this implies $\beta_{lower} = 0.0530$ (t = 3.33). In short, the coefficient on Pooled *CGI* is not highly sensitive to included covariates, and thus is not likely to be sensitive to omitted variables.

The ACET-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 $\hat{\beta}_1 = 0.0629$. 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 $\beta_{lower} = \hat{\beta} - (|\hat{\beta}_{narrow} - \hat{\beta}|$ Table 6, column (8) summarizes the results from this approach.[12] The ACET-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 .070 (for HHH bounds) or 0.075 (for ACET-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 0.050 (t = 1.51), versus a base estimate of 0.075 (t = 2.27). Only the Korea and Russia coefficients remain significant if we assume omitted covariates with the same strength as all included covariates (columns (7)-(8)). And the Russia results are suspect because the available covariates are limited and t-statistics are only moderate (t = 2.34 for HHH bounds in column (7)). At the same time, the lower bounds on country CGI are all positive and economically meaningful (ranging from .035 to .060). Taken as a whole, the bounds exercise supports the power of country-specific indices to predict Tobin's q, but also suggests the likely need to study a number of countries to obtain robust results.

6.2. Assessing Construct Validity

In the expanded working paper, we assess how well our country *CGI* indices appear to capture the unobserved concept of corporate governance, using two approaches. First, for each country *CGI* and subindex, we compute Cronbach α, a measure of correlation between elements of a multipart measure. Cronbach α measures only whether multiple elements measure a similar underlying concept, but not whether the underlying concept is what one has posited it to be. In psychology, if different elements are designed to capture different aspects of an underlying concept, α values above 0.7 are considered strong, and values above 0.6 are respectable (Kline, 2000). For country *CGI*, α values range from 0.64 in India to 0.95 in Turkey. At the subindex level, results are more mixed, ranging from 0.10 for shareholder rights in India to 0.98 for disclosure in Turkey. Low values for particular country subindices suggest that these subindices may be poor constructs. At the same time, 7 of the 20 subindex values are 0.6 or above, and 13 are 0.5 or above.

We also conduct a principal component analysis at both the subindex and element level. At the subindex level, for each country, we (i) include all subindices separately in an OLS regression; (ii) retain factors with eigenvalue > 1.0; and (iii) apply either no rotation or a *varimax* rotation which produces orthogonal factors. The element-level procedure is similar. The loadings suggest that most country-level subindices capture coherent elements of governance.

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 data on governance, especially time-series data; and endogeneity, principally omitted variable bias. We address these challenges by building country-specific indices,

doing so over time, and applying RE and FE methods with extensive covariates. FE with both extensive covariates and country-specific response surfaces is likely to be the best available research design, but remains vulnerable to bias due to 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.

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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**	**2006-11**	
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	11.0	7.9	88.3
RCGI	Russia Corporate Governance Index (normalized)	0.00	1.00	-2.90	3.51
TCGI	Turkey Corporate Governance Index	44.7	13.1	9.3	74.7
Pooled *CGI*	Pooled Corporate Governance Index (normalized)	0.00	1.00	-2.98	5.21
Common Index	Index of 15 elements available in Brazil, India, Korea and Turkey (normalized)	0.00	1.00	-3.59	5.56
Pooled Non-common *CGI*	Pooled *CGI*, excluding elements of Common Index (normalized)	0.00	1.00	-2.23	3.73
Tobin's *q*	(book value of debt + market value of common stock)/ book value of assets.	1.13	1.08	0.24	32.87
ln (assets)	*ln*(book value of assets)	10.53	5.28	3.34	25.34
ln (listed years)	*ln*(years since public listing + 1). India: Use years since incorporation.	3.14	1.79	0.00	7.60
Leverage*	(Total liabilities)/assets. India: Use total debt.	0.49	0.22	0.00	3.33
Net Income/assets**	Ratio of net income over assets	0.03	0.10	-0.71	0.46
EBIT/sales**	Earnings before interest and tax (EBIT)/total sales	0.09	0.53	-0.58	0.72
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 total 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	0.30	0.23	0.00	1.00
Foreign ownership	Fractional ownership by foreigners	0.07	0.13	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 firm is cross-listed in US (any level) in year *t*, 0 otherwise	0.07	0.25	0.00	1.00
industry dummies	defined in each country; mapped to US 2-digit SIC codes	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 effect (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 (2006-2011)		Russia (1999-2005)	
Method	RE	FE	RE	FE	RE	FE	RE	FE	RE	FE
normalized Country *CGI*	**0.114*****	0.089	**0.064****	**0.075****	**0.048*****	**0.045*****	**0.071*****	**0.055****	**0.094*****	**0.067*****
	(3.03)	(1.15)	**(2.57)**	**(2.27)**	**(6.26)**	**(5.33)**	**(2.58)**	**(2.06)**	**(6.22)**	**(2.75)**
(w. industry clusters)	**(2.69)*****	(1.08)	(1.85)*	(1.73)*	**(5.80)*****	**(6.79)*****	**(2.27)****	**(2.01)****	**(4.60)*****	**(2.64)*****
No. of industry clusters	38	26	32	32	48	47	36	36	49	49
Ln (Assets)	-0.039*	**-0.413*****	0.019	**-0.411*****	**-0.047*****	**-0.053*****	**-0.110*****	**-0.258*****	**-0.131*****	**-0.226*****
	(-1.65)	**(-5.23)**	(0.57)	**(-4.14)**	**(-6.46)**	**(-3.57)**	**(-5.48)**	**(-4.26)**	**(-5.75)**	**(-4.79)**
Years Listed	**-0.134*****	-0.331*	-3.688	**31.275*****	**-0.076*****	**-0.142*****	-0.057	**-0.225*****		
	(-3.52)	(-1.98)	(-1.37)	**(3.52)**	**(-8.75)**	**(-4.87)**	(-1.57)	**(-3.95)**		
Leverage	**0.362*****	-0.054	**-0.716*****	0.286	**0.748*****	**0.733*****	**0.665*****	**0.829*****	**0.453*****	**0.375****
	(6.08)	(-0.18)	**(-3.43)**	(0.74)	**(22.68)**	**(17.61)**	(6.76)	(5.54)	**(3.89)**	**(2.30)**
Net income/assets	0.347	-0.725	1.483*	1.131	**0.1410*****	**0.148*****	**0.481*****	**0.394*****	**0.787*****	0.359
	(1.40)	(-1.43)	(1.96)	(1.28)	**(3.73)**	**(3.87)**	**(3.47)**	**(2.66)**	**(2.87)**	(1.30)
EBIT/sales	**0.006*****	0.462	0.000	0.016	-0.007*	**-0.009****	-0.013	-0.03		
	(3.37)	(0.81)	(0.55)	(0.44)	(-1.95)	**(-2.21)**	(1.18)	(-0.36)		
Sales growth	0.033	**0.201****	**0.466*****	0.163	-0.0001	**-0.0002*****	0.14	0.160*	**0.190*****	**0.248*****
	(0.64)	**(2.53)**	**(3.68)**	(0.75)	(-1.06)	**(-2.60)**	(1.55)	(1.73)	**(3.16)**	**(3.76)**
PPE/sales	-0.014	0.052*	**0.001*****	0.000	**-0.010****	**-0.015****	0.01	0.018*		
	(-1.35)	(1.81)	**(5.46)**	(0.13)	**(-2.04)**	**(-2.54)**	(1.40)	(1.67)		
Share turnover	0.031	0.060	**0.536*****	**0.761*****	**0.005*****	**0.005*****	**0.039****	**0.038****	-1.503*	-1.498*
	(0.81)	(1.33)	**(4.28)**	**(3.41)**	**(6.74)**	**(6.66)**	**(2.20)**	**(2.41)**	(-1.95)	(-1.67)
Inside ownership	0.005	0.165	**0.615*****	0.929	**-0.183*****	**-0.175*****	0.097	0.268		
	(0.06)	(0.80)	**(3.07)**	(1.63)	**(-3.84)**	**(-2.66)**	(0.73)	(1.12)		
Foreign ownership			**1.501*****	**2.491*****	**0.469*****	**0.456*****	-0.27	-0.367*		
			(4.64)	**(3.71)**	**(7.69)**	**(6.63)**	(-1.34)	(1.66)		
State ownership	-0.079	**-2.664*****	-0.690	**-37.457*****	0.142	0.209*	**0.370****	**0.645*****		
	(-0.25)	**(-4.69)**	(-0.76)	**(-5.00)**	(1.55)	(1.94)	**(2.08)**	**(6.13)**		
Free Float					**-0.139*****	**-0.175*****	**-0.234****	-0.07		
					(-3.30)	**(-3.32)**	(-2.46)	(-0.63)		

Dependent Variable	ln(Tobin's *q*; outliers excluded)									
Country (years)	Brazil (2004-2009)		India (2006-2012)		Korea (1998-2004)		Turkey (2006-2011)		Russia (1999-2005)	
Method	RE	FE	RE	FE	RE	FE	RE	FE	RE	FE
Capex/PPE			-0.000	-0.000	**0.095*** **	**0.071*** **	**0.008*** **	**0.006** **		
			(-1.13)	(-0.84)	**(4.01)**	**(3.13)**	(4.49)	(2.09)		
R&D/sales			**5.054** **	-3.880	**0.030*** **	**0.024*** **	**-4.006*** **	**-3.350** **		
			(2.29)	(-0.57)	**(5.80)**	**(3.15)**	(2.74)	(2.00)		
Advertising/sales			-0.014	-0.930	**0.994** **	0.986*				
			(-0.45)	(-0.44)	**(2.19)**	(1.70)				
Exports/sales			-0.136	0.053	**-0.046** **	-0.056*	0.032	0.018		
			(-1.25)	(0.17)	**(-2.13)**	(-1.90)	(0.27)	(0.13)		
Market Share					**0.169*** **	**0.173** **	0.071	0.283		
					(2.60)	**(2.37)**	(0.49)	(0.61)		
Business group dummy	**-0.163** **		0.026		**0.043*** **		0.054			
	(-1.97)		(0.385)		**(2.62)**		(0.92)			
Cross-listing dummy	**0.207** **	**0.260** **	-0.094		0.043		0.016	0.001		
	(2.55)	**(2.41)**	(-1.080)		(1.07)		(0.39)	(-0.03)		
MSCI			0.208		**0.0381** **		0.107	-0.046	**0.375*** **	
			(1.456)		**(2.18)**		(1.60)	(-0.89)	**(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	146	636	423	3,285	3,285	969	969	964	964
Number of firms	159	72	399	186	669	0.383	193	193	240	240
Breusch-Pagan (χ^2; p)	27.84 (0.0000)		32.78 (0.0000)		1065.68 (0.0000		328.89 (0.0000)		917.79 (0.0000)	
Hausman test (χ^2; p)	31.63 (0.0045)		n.a.		133.34 (0.0000)		91.44 (0.0000)		n.a.	
CRE (F for all vars., p*)*	27.62 (0.0102)		77.79 (0.0000)		125.62 (0.0000)		74.41 (0.0000)		164.95 (0.0000)	
CRE (t for CGI alone)	0.60		-1.28		1.47		0.74		**2.44** **	
Median RE λ	0.33		0.30		0.63		0.66		0.71	
R^2	0.40	0.50	0.33	0.34	0.53	0.38	0.48	0.52	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	**0.067*** **	**0.015** **	0.002	**0.092*** **	-0.014*	**0.069*** **
				(7.30)	**(2.04)**	(0.22)	**(6.88)**	(-1.78)	**(7.01)**
			(w ind'y*country clusters)	**(5.67)**	(1.70)*	(0.18)	**(7.79)**	(1.74)	**(6.63)**
			Breusch-Pagan (χ^2)	897.1	1068.4	1055.3		1074.2	
			CRE (F for all vars.)	251.6	163.5	141.3		206.6	
			CRE (*t* for *CGI* alone)	0.15	0.40	0.76		0.43	
			Median RE λ	0.715	0.721	0.722		0.723	
			Overall R^2	0.46	0.48	0.48		0.48	
(2)	FE (weighted)	same as (1)	Coefficient	**0.063*** **	0.008	-0.001	**0.081*** **	-0.012	**0.057*** **
				(3.95)	(0.55)	(-0.04)	**(2.84)**	(-0.84)	**(3.38)**
			(w ind'y*country clusters)	**(3.17)**	(0.46)	(-0.06)	**(2.84)**	(0.93)	**(3.34)**
			Within R^2	0.41	0.41	0.42		0.42	
	Results with weaker covariates								
(3)	FE (weighted)	common covariates; year (not interacted w. country dummies	Coefficient	**0.084*** **	0.004	-0.010	**0.120*** **	-0.023	**0.076*** **
				(4.78)	(0.26)	(0.73)	**(3.39)**	(1.62)	**(3.91)**
			Within R^2	0.32	0.30	0.32		0.33	

Notes. Indices are defined in text. Coefficients on covariates are suppressed. FE regressions use country weights = (1/no. of firms). All Breusch-Pagan and 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.
Hosman, Hansen and Holland (2010) (HHH) and Altonji, Conley, Elder, Taber–Oster (ACET-O) lower bounds on FE estimates.

Rows	Governance Index	Covariates	Narrow	Base	HHH Bounds Omitted variable based on					ACET – 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)
			β_{narrow}	$\hat{\beta}$	β_{lower}					$\beta_{lower} - \lvert\beta_{narrow} - \hat{\beta}\rvert$
(1)	Pooled *CGI*	common* country	**0.0707*** **	**0.0629*** **	**0.0624*** **	**0.0620*** **	**0.0579*** **	**0.0613*** **	**0.0530*** **	**0.0552*** **
			(4.28)	**(3.95)**	**(3.92)**	**(3.89)**	**(3.64)**	**(3.85)**	**(3.33)**	**(3.46)**
(2)	Pooled *CGI*	common	**0.0906*** **	**0.0826*** **	**0.0825*** **	**0.0813*** **	**0.0811*** **	**0.0820*** **	**0.0703*** **	**0.0746*** **
			(5.26)	**(4.84)**	**(4.84)**	**(4.77)**	**(4.75)**	**(4.81)**	**(4.12)**	**(4.37)**
(3)	Brazil *CGI*	country	**0.1361** **	0.0887	0.0870	0.0794	0.0612	0.0778	0.0595	0.0419
			(2.14)	(1.15)	(1.12)	(1.02)	(0.79)	(1.00)	(0.77)	(0.54)
(4)	India *CGI*	country	**0.0893*** **	**0.0750** **	**0.0743*** **	**0.0743*** **	**0.0743*** **	**0.0743*** **	0.0501	0.0607*
			(2.89)	**(2.27)**	**(2.25)**	**(2.25)**	**(2.25)**	**(2.25)**	(1.51)	(1.84)
(5)	Korea *CGI*	country	**0.0449*** **	**0.0448*** **	**0.0439*** **	**0.0423*** **	**0.0369*** **	**0.0447*** **	**0.0372*** **	**0.0399*** **
			(4.93)	**(5.33)**	**(5.19)**	**(5.00)**	**(4.37)**	**(5.30)**	**(4.40)**	**(4.73)**
(6)	Turkey *CGI*	country	**0.0841*** **	**0.0550** **	**0.0536** **	**0.0536** **	**0.0536** **	**0.0533** **	0.0347	0.0259
			(2.67)	**(2.06)**	**(2.01)**	**(2.01)**	**(2.01)**	**(1.99)**	(1.30)	(0.97)
(7)	Russia *CGI*	country	**0.0645** **	**0.0670*** **	**0.0669*** **	**0.0658*** **	**0.0595*** **	**0.0645*** **	**0.0570*** **	**0.0645** **
			(2.48)	**(2.75)**	**(2.74)**	**(2.70)**	**(2.44)**	**(2.64)**	**(2.34)**	**(2.65)**

Notes. Column (1) shows coefficients for pooled *CGI* and country *CGI*s from "narrow" FE regressions, for which the only covariates are year dummies. Column (2) adds covariates. Columns (3)-(7) show HHH lower bounds on coefficient estimate under different assumptions about omitted covariates. Column (8) shows ACET-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).

[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 the effects of country-level governance – the "LLSV and all that" line of research on 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] Our Korea, Russia, and Turkey datasets and replication statistical code will be posted on the Social Science Research Network www.ssrn.com, and linked to the expanded working paper version of this article. The Brazil, India, and pooled datasets are subject to confidentiality restrictions, and are available from the authors for projects that do not overlap with our own work in progress, who agree to maintain the needed confidentiality.

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

[6] 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).

[7] 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).

[8] 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.

[9] Stata code is available from the authors on request.

[10] More formally: Regress a on c and constant term, determine the residual $\ddot{a}$, and similarly for b, then compute $Corr(\ddot{a}, \ddot{b})$. See, e.g., Angrist and Pischke (2009), § 3.2.2.

[11] 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.

[12] ACET-O assume that covariates will reduce β_1, and thus use $\beta_1 - \beta_{narrow}$ instead of $|\widehat{\beta}_1 - \beta_{narrow}|$.