

The Dynamics of Corporate Governance: Evidence from Brazil

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Abstract

We study the evolution of corporate governance (CG) practices in Brazil over 2010-2019, using a country-specific Brazil Corporate Governance Index (BCGI) validated in prior work. We study separately firms in high-governance and low-governance legal regimes, in a single country. CG improved considerably in Brazil over 2010-2015, with much smaller changes over 2015-2019. Positive CG changes are much more common than negative changes. Some firms made only minimal changes, despite low initial CG levels. We also study which firm financial factors predict both CG levels and changes in levels. None of the firm financial variables we study consistently predicts CG levels. However, for CG changes, a measure of equity financing need predicts CG improvements in the first half of the sample period, but only for firms in the lower governance regime, not for firms in the higher regime. This is the first article to find evidence for firm financial characteristics predicting CG changes, consistent with theoretical predictions, including stronger effects for firms in the lower governance regime.

Keywords: Brazil, corporate governance, boards of directors, minority shareholders, disclosure

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

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1 – Introduction

After 25 years since the seminal paper of La Porta et al (1998), very little is known about what factors influence firms' choices about firm level corporate governance (FLCG or CG), above the minimums set by each country's rules. Durnev and Kim (DK, 2005) provide a basic theoretical model linking firm characteristics to FLCG. The model has three main predictions: Prediction 1: firms with better investment opportunities, more concentrated ownership, and greater need for external financing will have better FLCG; Prediction 2: firms that have better FLCG are valued higher; and Prediction 3 these relations are stronger in weak legal regimes. Prediction 2 has been extensively examined in the literature. Here we address Predictions 1 and 3.

Several studies using cross-sectional, cross-country data report evidence supporting Prediction 1, e.g., Klapper and Love (2004), DK, and Francis, Khurana and Pereira (2005). However, Doidge, Karolyi and Stulz (DKS, 2007) challenge Propositions 1 and 3 by showing that country characteristics, rather than firms' characteristics, explain most of the variance in FLCG; and that firm characteristics explain very little of the variation in FLCG in less-developed countries (where weak legal regimes prevail). Country case studies confirm the negative result of DKS for Proposition 1, e.g., Black, Jang and Kim (2006, Korea); Balasubramanian, Black and Khanna (2010, India); Ararat, Black and Yurtoglu (2017, Turkey); and De Carvalho and Sampaio (2020, Brazil).

We claim that there may be a design problem on these and other within-country tests for Proposition 1. Any given country will have a set of CG rules that, in most cases, apply to all firms. Given this, the effect of those rules drops out of an assessment of variation across firms, and proposition 1 can be expressed as

$$FLCG_{i,t} = f(FC_{i,t}), \quad (1)$$

where $FC_{i,t}$ is a vector of characteristics of firm i in period t , and the feasible values of FLCG are constrained by country-specific rules.

Empirical studies of the determinants of FLCG often test Model 1, using a linear econometric model of the type:

$$FLCG_{i,t} = \beta_0 + \vec{\beta} * FC_{i,t} + \varepsilon_{i,t} \quad (2)$$

Many studies, especially earlier ones, rely only on cross-sectional data, but a stronger empirical specification would use panel data on the same firms over time, and include both firm fixed and year fixed effects (f_i and g_t respectively):

$$FLCG_{i,t} = \beta_0 + \vec{\beta} * FC_{i,t} + f_i + g_t + \varepsilon_{i,t} . \quad (3)$$

We refer to this specification as two-way fixed effects (TWFE).

Firm FE control for unobserved, time-invariant firm characteristics that would otherwise cause bias, if they correlate with both governance and the FC predictors. A cost of controlling for firm FE is that it is not feasible to study the effect of time invariant (or nearly time invariant) characteristics, such as ownership structure (predicted to matter in DK).

There are several additional concerns with whether Model 3 is adequate to study FLCG. First, FLCG involves firm rules and practices. Changing FLCG is costly and may require time. For instance, one would not expect that firms to adjust CG immediately every time the need for external finance changes. Furthermore, improving FLCG is easier than worsening it, because investors may interpret worsening CG as a signal that firm is more likely to expropriate investors. Thus, one should expect that the left-hand side of the regression model will move less frequently than the predictors on the right-hand side, and will move up more often than down.

Another important issue is that some investors may have a CG threshold that they require to buy a firm's shares. Thus, firms either reach the threshold level and can raise capital from investors, or keep their CG at a low level. This is so because the controllers will derive little value from partially adjusting CG. Doing so may reduce their freedom to extract private benefits from the firm, yet not pay off in greater access to equity capital. The threshold can change over time, as CG norms and minimum CG rules evolve. Changes in the threshold level that investors demand will lead firms that met the previous threshold to adjust their governance, even with no change in financial characteristics. Thus, a CG threshold for raising equity capital provides another reason for some firms to adjust their CG while others do not, and instead accept more limited access to equity capital.

Considering likely delays in changing CG, a possible approach would be to predict changes in FLCG over time, rather than FLCG levels. The model would have the form:

$$\Delta FLCG_{i,t} = g(FC_{i,t}). \quad (4)$$

Model 4 allows for several specifications for g , depending on how FLCG moves over time. If there were no asymmetry between FLCG increases and decreases, a possible implementation of Model 4 could be the linear model, with two-way (firm and year) fixed effects:

$$\Delta FLCG_{i,t} = \beta_0 + \vec{\beta} * FC_{i,t} + f_i + g_t + \varepsilon_{i,t}. \quad (5)$$

However, if it is costly to adjust CG, especially costly (rare) to worsen it, and investors have a CG threshold, one would observe that over time some firms adjust their CG to attract capital as legal rules and the CG threshold change, but other firms do not adjust their CG. Taking into account these dynamic aspects of FLCG, Model 5 may also not capture the dynamics of FLCG. Alternatively, a probabilistic model, such as Model 6 below, may be appropriate:

$$Prob(\Delta FLCG_{i,t} + \varepsilon_{i,t} > 0 | FC_{i,t}) = h(FC_{i,t} + f_i + g_t). \quad (6)$$

For example, a probit model implements Model 6 by assuming that the probability of a CG increase is normally distributed.

Brazil constitutes a unique ground to test DK Propositions 1 and 3. First, one can objectively track FLCG over time. A major concern in studying the dynamics of FLCG is how to measure FLCG over time. Commercial corporate governance ratings are available for a number of countries. However, Black et al. (2023) show that these ratings provide poor measurement of FLCG. One can potentially build country-specific measures, but these depend on good data on governance practices. For Brazil, the Brazilian Securities and Exchange Commission (Comissão de Valores Imobiliários, CVM) created a mandatory CG reporting system for publicly traded firms, beginning in 2010. These reports allow one to use the reported elements to build a country-specific Brazil Corporate Governance Index (BCGI), and track changes in firms' score on the index over time. BCGI was developed in prior work and has been validated as predicting Tobin's q in a panel-data framework with TWFE (De Carvalho, Dal'Bó, and Sampaio, 2021).

Second, a challenge in testing Proposition 3 is how to meaningfully classify countries into high and low-quality legal regimes. Legal regime is a country characteristic, that usually changes slowly over time, and will be related to many other country characteristics. Studying Brazil provides an opportunity to circumvent this problem. In Brazil, strong and weak legal regimes for

CG coexist, against the background of other legal rules and cultural influences that apply to both CG regimes. In 2000, the São Paulo Stock Exchange (by then, Bovespa, succeeded by B3) created three listing levels with increased CG requirements relative to the regular listing level (for which minimum governance rules are set by law): Novo Mercado (NM, highest FLCG), Level II (L2), and Level I (L1). NM and L2 are identical, except that NM forbids while L2 allows use of non-voting shares. L1 is similar to the regular listing, but somewhat stricter, mostly reflecting improved disclosure rules (De Carvalho, 2000, and De Carvalho and Pennacchi, 2012 describe the creation of these markets). NM and L2 require strong FLCG and foresee resolution of conflicts by arbitration which, according to the Brazilian law, has to provide a resolution within 180 days. Thus, the two types of listings, NM and L2 (which we abbreviate as NML2), versus L1 and regular listing (which we abbreviate as L1R) can be seen as providing two distinct CG and dispute resolution regimes for listed firms. The requirements for each listing level have not meaningfully changed since 2000.¹ As Figure 1 shows, in 2010, L1R had almost twice as many firms as NML2 (232 vs. 134). However, over time the number of firms in L1R has been decreasing while the number of firms in NML2 have been increasing (most initial public offerings since 2000 have been listed on NML2). By 2019, both types of listing had similar numbers of firms (164 vs. 163).

We report several interesting descriptive aspects of the evolution of FLCG, that prior research has not highlighted. First, the improvement of FLCG is uneven over time. In the 2010-2015 period, there was progressive, substantial improvement. In contrast, over 2015-2019, FLCG was mostly stable. Similar patterns, where governance changes rapidly in one time period, but more slowly in another period, have been reported in other countries and other periods: Black et al. (2012, Brazil), Ararat, et al. (2017 Turkey). Black and Kim (2012, Korea). Second, some firms do not adjust their FLCG (or do so minimally). During 2010-2015, there was strong improvement in FLCG for firms in the both high (NML2) and low (L1R) CG regimes, but also significant variation within each group. CG improvement was stronger in NML2 firms, from a higher starting

¹ There were modest changes in the NM requirements in 2018 that do not affect which BCGI elements are required. See https://www.b3.com.br/pt_br/produtos-e-servicos/solucoes-para-emissores/segmentos-de-listagem/sobre-segmentos-de-listagem/ [in Portuguese]. For instance, the new rules require a separate CEO and board chairman for large firms, above a size threshold determined by CVM.

level, than in L1R firms. Some firms, mostly in L1R, did not adjust FLCG at all, or did so only minimally, even when their initial levels were low. Third, positive changes in FLCG are much more common than negative changes. Moreover, most negative changes are small; large negative changes are very rare. Fourth, for the upper, NML2 listing level, we find compression over time in BCGI values; at some point, there is little further improvement left for firms to do.

Consistent with prior work, we find limited evidence that firm financial characteristics predict BCGI levels. However, when we shift from predicting *levels* to predicting governance *changes*, we find evidence that a multi-year measure of equity financing need (EFN) predicts CG improvements for L1R firms (as in DK Proposition 1). This is consistent with these firms improving governance to enhance access to equity capital. In contrast, neither EFN nor the other firm-level variables we study predicts CG changes for NML2 firms. This asymmetry between NML2 (high CG regime) and L1R (low CG regime) is consistent with DK Proposition 3, and with investors requiring a CG minimum threshold to buy shares, which firms in the high CG regime already satisfy.

A measure of asset tangibility predicts fewer CG improvements for L1R firms. This is also consistent with theory. Investors may find it easier to understand and value firms with more tangible assets, so governance may be less critical for firms with more tangible assets.

We find predictive power only during the first half of the sample period, when governance is changing rapidly, and not the second half, when changes are much more limited. A methodological implication of our results: to study FLCG with two-way fixed effects, one needs a panel data covering a period of substantial change. If one has panel data for a long period; one may need to study separately the period in which governance is changing more rapidly.

This article is structured as follows. Section 2 presents a historic overview of CG in Brazil. Section 3 describes our sample, CG index, and empirical methodology. Section 4 presents stylized facts on the evolution of corporate governance in Brazil over 2010-2019. Section 5 analyzes the firm characteristics that predict BCGI levels and changes. Section 6 provides discussion, and Section 7 concludes.

2 – History of corporate governance in Brazil

For most of the 20th century, Brazilian financial markets were heavily regulated. Brazil

adopted its first law regulating public corporations in 1940. The government ran the stock exchanges. Brokers were civil servants, who had the exclusive right to trade shares on the exchanges, and could pass this right on to their children. Government rules specified brokerage fees and the number of brokers in each stock exchange.

The first modernization wave began in the 1960s. In 1965, the government approved the first law to regulate capital markets and securities offerings (Law 4728/65). CVM was created in 1976 (Law 6385/76). A new corporate law, also enacted in 1976, established separate rules for closely held and public corporations (Law 6404/76). These reforms eliminated the civil-servant brokers and permitted private stock exchanges and broker-dealers to emerge.

During the 1970s and 1980s, the government took several steps to encourage stock market development. It granted tax incentives to firms that went public and to investors who purchased shares in public companies. Pension funds and insurance companies were required to invest a minimum percentage of their assets in the shares of public companies. To let firms issue shares while maintaining family control of firms, the corporate law was amended (6404/1976) to allow non-voting shares (typically, preferred shares with no voting rights, but economic rights equivalent to common shares) to form up to two-thirds of issued shares. Thus, a family could maintain control of a firm with only 17% of the equity (50% of the voting shares). By the end of the 1980s, there were almost 600 public companies, but a significant number had gone public only to capture the tax incentives, and had no interest in having public shareholders or active trading of their shares.

In the late 1980s, the financial incentives for going public were eliminated. Since then, many of the firms that went public during the tax-incentive period have returned to private ownership. Meanwhile, in the 1980s, the Rio de Janeiro Stock Exchange collapsed, leaving the Sao Paulo Stock Exchange, Bovespa, as the principal share-trading market. The remaining exchanges merged into Bovespa in 2000.

The 1990s was a period of intense changes: stabilization of inflation at acceptable levels; international trade liberalization; permission for international investors to buy shares in Brazilian firms; and large-scale privatization of state-owned firms. By the end of the 1990s, a large fraction of share trading involved privatized companies. To maximize the proceeds from selling control, the government amended the corporate law (Law 9457/1997) to remove tag-along rights in the change of control (granted in Law 6385/1976). Privatization and globalization brought not only

increased market capitalization and trading, but also sophisticated international investors who demanded good CG and criticized firms who did not respect minority investor rights. The groups that acquired controlling stakes in privatized companies were usually syndicates of international and local institutional investors. As consequence, local institutional investors became major shareholders, and also demanded CG improvements.

Meanwhile, in the 1990s, many large Brazilian firms cross-listed on the New York Stock Exchange (NYSE), and a significant portion of trading moved to the NYSE. Cross-listed firms had to meet NYSE governance standards. However, privatizations aside, there were almost no IPOs, and the number of public firms shrank.

There were a number of initiatives directed at improving Brazilian CG standards during this period. The Brazilian Institute for Corporate Governance (Instituto Brasileiro de Governança Corporativa, IBGC) was created in 1995, and released its first voluntary code on best practices in 1999. In 2000, Bovespa created the higher listing levels (NM, L2, and L1), in response to concern about weak protection for minority shareholders (including extensive use of non-voting shares, few outside directors, and low levels of disclosure). This contributed to a surge in initial public offerings, which had been nearly nonexistent until 2004 (De Carvalho and Pennacchi, 2012).

In 2001, there was a limited reform of corporate law (Law 10.303/2001). Tag-along rights, removed in 1997, were partially restored. CVM issued its own CG recommendations in 2002. However, these were pure recommendations (not a *comply-or-explain* regime). In 2009, CVM enacted mandatory reporting on CG practices starting in 2010; public firms were also required to comply with international financial reporting standards (IFRS) beginning in 2010 (under Law 11.638/2007).

CVM required firms to allow shareholder voting by mail starting in 2016 (ICVM 561/2015). CVM adopted a comply-or-explain governance code in 2017 (ICVM 586/2017); limited, however, to the firms whose shares are included in one of the two main stock indices. For example, in 2012 there were 89 firms in IBOVESPA and 12 firms that were in IBrX 100 but not in IBOVESPA. Thus, this rule affected only 101 large firms.

3 – Sample, governance indices, and empirical methodology

3.1 – Sample

The sample is all 413 public companies, listed at any time over 2010-2019. This number excludes eight foreign companies traded using Brazilian Depository Receipts, six companies in Bovespa Mais (special exchange listing for small firms, with limited public float) and 31 companies traded in the over-the-counter market, rather than the main Bovespa exchange.

As shown in Figure 1, over our sample period, the number of firms decreased somewhat from 366 in 2010 to 327 in 2019. However, this decrease was not uniform across listing segments. the number of NML2 firms rose from 134 to 163. The jump in 2018 reflects a strong initial-public-offering market. In contrast, the number of L1R firms fell almost monotonically over this period from 232 to 164.

3.2 – Brazil Corporate Governance Index (BCGI)

To compute overall BCGI and its subindices (CGIs), we follow Black et al. (2010, 2012, 2014). We build four subindices covering Board Structure, Board Procedures, Minority Shareholder Rights, and Disclosure. BCGI is computed as the average of the four subindices. Each subindex is calculated as the average of binary CG elements (coded as "1" if a firm has the attribute and "0" otherwise). A specific CG element is used only if (i) it is objectively measurable and included in the CG reports required by CVM; (ii) it is often believed to correspond to good CG, sometimes with empirical support, but often not; (iii) we considered it to be relevant to CG in light of Brazilian rules, institutions and practices; (iv) there is reasonable variation across firms in our sample; and (v) the element is not too similar to another element. There is necessarily judgment involved in defining CG elements and deciding which to include in the subindices.

BCGI for this study is similar but not identical to the BCGI used in these prior studies. The prior studies used surveys to collect information. Here we rely on public firm CG reports, available beginning in 2010. This provides a larger sample (all public firms, without selection bias) but limits our analysis of CG to elements included in the CG reports. The main differences between the current and prior indices are as follows. First, for financial disclosure, elements involving whether a firm follows Generally Accepted Accounting Principles and provides consolidated financial statements lost meaning with the adoption of IFRS in Brazil in 2010. Second, we omit the former subindex for control of related-party transactions (RPTs). This subindex consisted mostly of the procedures that firms use to approve RPTs and RPT disclosure. Firm procedures for

approving RPTs are not included in the CG reports, but RPT disclosure is mandatory. Third, we do not include an Ownership Structure subindex, which has little time variation.

BCGI is comprised of 25 firm attributes (elements) covering four principal aspects of governance (indices). Table 1 lists all CG elements and the evolution of their average values for both high and low CG regimes (Panels A and B).

Board Structure (7 elements). The role of the board of directors, in terms of CG, is to reduce agency problems inherent in organization and to improve decision-making (Hermalin and Weisbach, 2003; and Dahya et al., 2008). Board Structure comprises two dimensions: board independence and board committees. The Board Independence subindex comprises four elements, focusing on director independence and separation of the posts of CEO and board chairperson. Audit committees, in turn, predict the integrity and quality of financial reporting available to the market (Klein, 2002). However, in Brazil, fiscal boards frequently replace audit committees (Black et al., 2010). The Board Committees subindex comprises three elements, focusing on the existence of an audit committee or fiscal board, and whether these organs include a minority shareholder representative.

Board Procedures (4 elements). Board procedures are a common component of CGIs (Bhagat et al., 2008). This dimension tracks whether the board regularly evaluates the CEO and other executives, the existence of a code of ethics, and whether the firm has a bylaw governing the board.²

Minority Shareholder Rights (6 elements): tag-along or takeout rights (Nenova, 2003, shows that in Brazil tag-along is an important instrument for the protection of minority shareholders); minimum free float of 25% of outstanding shares (shares not held by the controlling group); shareholders' rights for the election of directors; preemptive rights; freezeout rights; and use of arbitration to solve disputes with minority shareholders.³

Disclosure (8 elements). Prior studies find that disclosure is directly related to market value (e.g., Klapper and Love, 2004; Durnev and Kim, 2005; Black et al., 2020). This dimension

² Compared to Black et. al (2010), the Board Procedures subindex lost two elements that are not available from the FRs: *the company had more than four face-to-face meetings during the year*, and *the board receives data and information before the meetings*.

³ Compared to Black et. al (2010), Minority Shareholder Rights lost one element: *minority shareholders elect a director*.

includes, among other elements, whether the firm prepares financial statements in English, provides structured management reports, and posts financial statements on the company's website. It also tracks whether the auditor provides other services besides auditing and is a Big-Four auditing firm.⁴

Within each subindex, elements are equally weighted. Thus, to compute the Board Structure subindex, we sum all seven elements, divide by seven, and multiply by 100. If a firm has a value missing for a particular element, we use the average score for the non-missing values. To calculate BCGI, we average the index scores. Thus, BCGI and its subindices range from 0 to 100.

3.3 – Econometric specification

To study the level of CG (BCGI), we use panel data analysis with firm and year fixed effects. We specified such model in the Introduction as Model (3) restated below:

$$BCGI_{i,t} = \beta_0 + \vec{\beta} * FC_{i,t} + f_i + g_t + \varepsilon_{i,t} \quad (3)$$

Where:

$BCGI_{i,t}$ is the corporate governance index, and

$FC_{i,t}$ is a vector of covariates that includes *Tobin's q*: measured as market capitalization plus book value of debt divided by book value of assets; *External Financing Need (EFN)*: following Durnev and Kim (2005), is the 2-year geometric average growth rate in total assets minus the maximum growth rate achievable without raising capital, measured as $ROE/(1 - ROE)$ (measured for one-year if two-year data is not available); *Ownership*: percentage of common shares held by the largest shareholder; *Tangibility*: fixed assets divided by total assets; *Size*: natural logarithm of total assets; and *Leverage*: total debt divided by total assets.⁵

f_i and g_t are firm and year fixed effects.

⁴ Compared to Black et. al (2010), Disclosure lost five elements that became mandatory: related party transactions disclosed to shareholders; firm discloses direct and indirect 5% holders; financial statements in IAS or US GAAP; financial statements are consolidated; and financial statements include statement of cash flows. However, an element for whether the firm uses a Big-Four auditor was added.

⁵ We do not separately control for profitability or sales growth because they are components of ENF.

To study the dynamics of CG, we use the first difference of BCGI ($\Delta BCGI_{i,t} = BCGI_{i,t} - BCGI_{i,t-1}$). We analyze $\Delta BCGI_{i,t}$ using two models specified in the introduction and restated below for convenience. First, the linear model with two-way fixed effects specified as

$$\Delta BCGI_{i,t} = \beta_0 + \vec{\beta} * FC_{i,t} + f_i + g_t + \varepsilon_{i,t}, \quad (5)$$

where, $FC_{i,t}$, f_i , and g_t are as specified above.

Second, we implement the probabilistic Model (6) as a probit model:

$$Prob(\Delta FLCG_{i,t} + \varepsilon_{i,t} > 0 | FC_{i,t}) = \Phi(FC_{i,t} + f_i + g_t). \quad (6)$$

where $FC_{i,t}$, f_i , and g_t are as specified above, and Φ is the cumulative standard normal distribution function.

All regression use standard errors clustered on firm. Table 2, Panel A describes the covariates. All covariates are winsorized at the 5% and 95% levels. Table 2, Panel B reports basic statistics for the winsorized covariates. Table 3 reports the Pearson correlations between the covariates. Most correlations are small (usually below 0.2), with the exception of the correlation of 0.33 between size and leverage.

4 – Stylized facts on the evolution of FLCG

In this section we discuss the evolution of FGCG over 2010-2019. We describe some stylized facts, some of which has been reported before but have not been recognized as a pattern.

4.1 – Improvement in aggregate FLCG comes in waves

We begin by describing the evolution of the aggregate FLCG over 2010–2019. Figure 2 reports the average BCGI for a balanced panel of firms which were publicly traded throughout our sample period (results for an unbalanced panel are similar, see Black, de Carvalho and Gallucci Netto, 2023). The mean BCGI for all listed firms in 2010 was 49 points. This mean level steadily increased to 61 in 2015, and 65 in 2019. Thus the improvement was 12 points in the first period versus 4 points in the second.

The pattern of uneven improvement in FLCG was observed in both CG regimes. Firms in NML2 began at a higher average level than L1R firms (68 versus 38 points). The NML2 mean level increased steadily to 81 in 2015 but then leveled off; the 2019 means was 82. For L1R firms

there was improvement over 2010-2015, from 38 to 45 points, although less than for NML2, and then slower but continued improvement after that to a mean of 48 in 2018 and 2019. However, the gap between the two groups remained large, and indeed increased somewhat from a 30-point difference in 2010 to a 34-point difference in 2019.

The overall improvement in BCGI for the whole sample has two components. The first is improvement in BCGI scores for each group. The second is the increasing share of NML2 firms as a fraction of all public firms (Figure 1).

Uneven improvement in FLCG over time has been reported in other studies, although it has been recognized as a pattern which may exist in many countries. For instance, Black et al. (2012), study Brazil using survey data for 2004, 2006 and 2009. They report that their overall BCGI index (similar to the current measure, but not identical) improved sharply between 2004 and 2006, from 52 to 62 points, but increased by only one point between 2006 and 2009. Ararat, et al. (2017) study Turkey. They report that from 2006 to 2011, a Turkey governance index increased by only 5 points (from 42 to 47), while from 2011 to 2012 it increased by 16 points (from 47 to 63). Black and Kim (2012) study Korea, their Korean governance index increased by 17 points between 1998 and 2002 (from 24 to 41, driven partly by changes in legal rules), but then increased by only 3 points from 2002 to 2004. Thus, the evidence in this article along with those mentioned suggests a tendency for CG changes to come in waves.

An implication of this pattern both for research on whether FLCG predicts firm value, and for research on the factors that predict FLCG: One not only needs panel data on firms over time, to allow use of firm FE, but the sample period must include a period when governance is changing enough so that a firm FE specification has reasonable power.

4.2 – Compression in the high CG regime (NML2) and Dispersion in the low CG (L1R) regime

The nature of FLCG changes also differed between the NML2 and L1R regimes. Figure 3 illustrate these differences, as do the element by element results in Table 1. It shows FLCG histograms for both regimes at the beginning of our sample period (2010), in the middle (2015) and at the end of the period (2019). The histogram for NML2 shows 1) substantial adjustment

over 2010-2015; 2) little further change over 2015-2019; and 3) compression in CG scores, with many firms having scores of 80 or above, leaving little room for further improvement. In contrast, the histograms for L1R shows both slower adjustment and much more dispersion of CG values across firms.

An analysis by quartiles of FLCG helps to understand the two movements (compression and dispersion). Table 4 divides firms by quartiles based on FLCG in 2010, and reports the average improvement for each group of firms. There are substantial increases in within-quartile means, for both NML2 and L1R. For NML2, there was some compression in scores with a mean increase of 16 points for firms that were in the bottom quartile, versus an 11-point increase for those in the top-quartile. Compression at the top reflects, in part, that a number of BCGI elements are required for NML2 firms (marked by ** in Table 1, Panel B). Moreover, even among the non-mandatory elements, there were an increasing number of elements which all or almost all NML2 firms met, leaving less room for further improvement. Compression was observed most strongly for the elements of the Disclosure Index and also for the Shareholder Rights Index, for which four of the six elements are mandatory for NML2. See Table 1.

In contrast to the convergence and compression for NML2 firms, there was divergence in L1R scores, with the mean increasing by only 8 points for the firms that were in the bottom-quartile, versus 12 points for those in the top quartile.

4.3 – FLCG increases are much more common than decreases

Firms which change CG are much more likely to increase rather than decrease their BCGI scores. The yearly variations in BCGI have many zeros, most of the non-zero variations are positive, and the negative changes are small. This is illustrated in the histograms in Figure 4. For the whole market, 57.2% of annual changes are zero, and only 9.5% are negative; with similar percentages for NML2 (56.5% zero, 9.0% negative) and L1R (58.5% zeros, 10% negative). Moreover, the negative changes are almost always small. In contrast, at least some positive changes are large.

4.4 – Some firms do not view governance as a priority

Table 5 provides another view of the differing patterns of governance evolution for the high-CG and low-CG regimes. It focuses on the change in BCGI from 2010 to 2019 for firms which were in the bottom quartile of BCGI scores in 2010 within each group, and remained publicly traded in 2019. In both the NML2 and L1R regimes, some firms made few changes, despite low initial scores. Others, in both groups, made more substantial changes. However, only a handful of NML2 firms with low initial scores made few changes; in contrast, a much larger number of L1R firms made limited changes despite low initial scores.

We cannot study the full set of reasons for the differences in firm choice of governance quality, but there are a number of possible reasons. Firms with low governance scores may not feel that they need to raise equity capital. Many are family controlled and governance (much of which affects only minority shareholders) may not seem important to them; moreover, some controllers may want to be able to engage in some level of related party transactions with limited disclosure of these transactions; some may face limited product market competition.

5 – Regression analysis

5.1 – The level of corporate governance

We study first the factors which predict the *level* of corporate governance. In Table 6, Regressions 1-3, we study the firm-level factors that predict BCGI for, respectively, all firms, NML2 firms, and L1R firms, over the full sample period. Regression 1 includes all firms; Regression 2 studies NML2 firms, and Regression 3 studies L1R firms. In Regressions 4-6, we study the first half of the sample period (2010-2014); Regressions 7-9 cover the second half of the sample period (2015-2019). In Regression 1, consistent with De Carvalho, Dal’Bó and Sampaio (2021), none of the financial variables we consider are consistent predictors of BCGI for the full sample and the full sample period.

Next, we divide the sample into NML2 and L1R. In Regression 2, asset tangibility and firm size predict higher CG scores for NML2 firms, but Tobin’s q predicts lower CG scores. However, in Regression 3, none of the financial variables predict governance for L1R firms. In the remaining regressions, we see that the full-period results for NML2 firms come from the first

half of the sample period, when governance for NML2 firms was changing rapidly (compare Regressions 2, 5, and 8). These results drive similar results for the full sample (Regression 4). For L1R firms, in contrast, none of the financial variables are significant predictors in either subperiod.

These results do not match theoretical predictions, such as those from Durnev and Kim (2005) that firm growth, need for equity finance, and inside ownership should be reflected in better CG. None of Tobin's q (which proxies for growth opportunities), equity financing need, or inside ownership, predicts higher BCGI. Conversely, it is not apparent why asset tangibility should predict higher BCGI, even if only for NML2 firms. If anything, firms with more intangible assets, which are harder for investors to value, might be expected to have stronger need for governance. The negative coefficient on $\ln(\text{Tobin's } q)$ for NML2 firms in the 2010-2014 period is also contrary to theoretical predictions. At the same time, our largely null results are consistent with Black et al. (2006; Korea), Balasubramanian et al. (2010; India), Ararat et al. (2017; Turkey), and De Carvalho Dal'Bó and Sampaio (2021; Brazil).

5.2 – The dynamics of governance

We now examine which firm financial characteristics predict changes in FLCG. Given the stickiness of FLCG, with many firms making few or no changes, studying changes may provide additional information that is not apparent when studying FLCG levels. We begin our analysis in Table 7 with a linear model with firm and year FE. The format of Table 7 is otherwise similar to Table 6. Regressions 1-3 report results for the full sample period for the whole market, NML2, and L1R, respectively. Regressions 4-6 report results for 2010-2014, and Regressions 7-9 report results for 2015-2019.

For NML2, none of the predictors is significant, either for the full sample period (Regression 2) or in either subperiod (Regressions 5 and 8). This is consistent with financial variables being less important predictors of governance for firms in stronger legal regimes.

For L1R firms, we observe a different pattern for the full sample period in Regression 3. Equity financing need positively predicts change in FLCG, consistent with theory. Asset tangibility predicts lesser change. It is plausible that investors can more easily understand and value firms that rely more heavily on tangible assets, so these firms have less need to show strong

governance to obtain equity financing. EFN and tangibility are also significant for the pooled sample of all firms. The EFN result for all firms is driven by L1R firms; the tangibility result comes from both groups of firms. Both results are driven by the first half of the sample period, in which there was more rapid change in governance. In the second half of the sample period, there are no significant predictors for either group, although $\ln(\text{Tobin's } q)$ takes a positive and significant coefficient for the full sample.

The predictive power of EFN for L1R firms, but not for NML2 firms, is consistent with DK Prediction 3 (firm financial characteristics will be stronger predictors of FLCG in weaker legal regimes). It is also consistent with a threshold effect, in which NML2 firms do not need to improve FLCG in order to raise equity capital, because they are already above the threshold for doing so.

After controlling for EFN (which is based on a combination of growth and profitability) we do not find support for another DK prediction, that firms with stronger growth opportunities (proxied by Tobin's q) tend to have stronger governance. In the Appendix, as a robustness check, we use past sales growth instead of Tobin's q as a proxy for growth opportunities. Sales growth does not predict FLCG either. We also do not find predictive power for ownership, but this could reflect low statistical power, because ownership is very stable over time, within firm.

In Table 8, we turn to Probit regressions, for which the outcome is 1 for firms where FLCG increases, and 0 otherwise. The format of Table 8 is otherwise similar to Tables 6 and 7. The Probit results for the full sample period and the second half of the period are consistent with Table 7. For NML2 firms, none of the predictors is significant for the full sample period. For L1R firms for the full sample period, EFN predicts a higher likelihood of a positive change in FLCG; while tangibility predicts a lower likelihood of a positive change. Once again, the pooled results across all firms are driven by the results for L1R firms. In the Appendix, controlling for future delisting or excluding state-owned enterprises has little effect on the coefficients on EFN and tangibility. Thus, we obtain consistent results with both the linear and probit models.

For the first half of the sample period, the results for EFN, seen for L1R in Table 7, lose significance. However, consistent with DK, an increase in ownership predicts lower likelihood for a firm to take action to improving CG. However, given the null results in Table 7, with opposite

sign for NML2 firms, we are reluctant to put much weight on a coefficient that is significant but not strongly so.

5.3 - Robustness Checks

In the Appendix, we obtain similar results to those reported above in robustness checks in which we (i) drop firms that delist in either the same year or the next year; (ii) include these firms, but add controls for delisting in the same year or the next year; (iii) exclude state-owned enterprises; and (iv) replace Tobin's q with sales growth as a predictor variable.

6 – Discussion

After more than two decades of research on the factors that predict FLCG, very little is known about which predictive factors are important. The Brazilian system of disclosure on CG practices allows tracking of CG over time, and further allows us to study both a high-governance legal regime (NML2) and a low-governance legal regime (L1R), in a single country where other background factors are similar for both regimes. We find large differences between the two regimes, both in the evolution of FLCG over time and the association of firm characteristics with governance changes. These differences cannot be observed in countries where all firms are subject to a similar governance regime, and may help to explain null results in other studies of the association between firm characteristics and firm-level governance choices.

Using this rich data, we first provide a detailed description of how CG practices in Brazil evolved over time. First, we find that there can be periods of rapid change in FLCG but also periods of slow change. Second, some firms choose to adjust governance over time, while others do not, even if their initial governance levels are low. Third, changes that improve governance are much more common than changes that worsen governance.

These characteristics of the dynamics of CG might explain the mostly negative results found in prior studies, in which firm-level factors are not strong predictors of FLCG. They suggest a change in focus, from assessing what firm factors predict governance levels to what factors predict governance changes.

Our results on the factors that predict FLCG have implications for studies that study the association between FLCG and firm outcomes such as Tobin's q or profitability. A broad concern for these studies is the risk of endogeneity, in which an observed correlation between FLCG and an outcome reflects omitted variable bias or reverse causation, rather than a causal effect of FLCG on the outcome. One particular concern that a positive correlation between CG and Tobin's q , which is interpreted as providing evidence that governance can increase firm value, may instead reflect reverse causation, with firms with higher Tobin's q improving their governance. The near-zero coefficient on Tobin's q for all firms in Table 6, reflecting a negative coefficient for NML2 firms and an insignificant positive coefficient for L1R, suggests that reverse causation, with higher Tobin's q predicting higher governance scores, is not a strong concern. Moreover, the weak ability of observed covariates to predict FLCG in Table 6 makes it more likely that unobserved covariates may also only weakly predict FLCG. If so, then omitted variable bias when using FLCG to predict outcomes may be small, at least in studies which include firm and time FE and control for a broad set array of observed variables. This makes it more likely that an observed association between FLCG and an outcome is causal, despite these studies lacking a true causal design.

7. Conclusion

Consistent with the prior literature, we find little power of firm financial characteristics to predict governance levels. However, when we study governance changes, we find support for two theoretical predictions: Equity financing need predicts positive changes in FLCG, while greater asset tangibility predicts fewer changes. Both predictions are supported only for the lower governance regime (L1R). In contrast, for firms in the higher governance regime (NML2), firm factors do not predict governance changes. This asymmetry is also predicted by theory. Another possible explanation for the differences between L1R and NML2 firms is a threshold effect, in which equity investors insist on a minimum CG level, where NML2 firms are already above the threshold, and thus can raise equity capital without improving their governance.

7 – References

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Table 1. Description of elements and evolution of mean scores

Description of indices and their elements, and average for each element. Each component takes value 100 if criterion is satisfied or zero, otherwise. Each index and subindex equals average value for its elements. BCGI equals average of the 4 indices (Board Structure, Board Procedure, Minority Shareholder Rights, and Disclosure). Board Structure Index is comprised of subindices for Board Independence and Audit Committee and Fiscal Board. * indicates element required for Level 1 (also required for Level 2 and Novo Mercado, ** indicates element required for Level 2 and Novo Mercado).

Panel A: Novo Mercado and Level 2 listings

		Mean									
Independence Subindex		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Board Structure Index: Board Independence Subindex											
**BdIn.1	Board includes one or more independent directors	100	100	100	100	100	100	100	100	100	100
BdIn.2	Board has at least 30% independent directors	55	55	57	59	64	69	70	71	69	71
BdIn.3	Board has at least 50% independent directors	29	30	30	32	35	38	39	41	43	46
*BdIn.4	CEO is NOT chairman of the board	76	82	85	95	100	100	100	100	100	100
Board Structure Index: Audit Committee and Fiscal Board Subindex											
BdCm.1	Audit committee exists	38	38	42	46	48	50	52	53	57	58
BdCm.2	Permanent or near-permanent fiscal board exists	57	64	66	69	72	74	73	81	83	84
BdCm.3	Company has either permanent fiscal board or audit committee which includes minority shareholder representative	40	49	54	56	56	59	58	57	55	57
Board Procedure Index											
Pr.1	Firm has system to evaluate CEO performance	57	62	68	71	74	74	73	73	73	73
Pr.2	Firm has system to evaluate other executives	30	33	36	39	40	40	40	42	44	44
Pr.3	Firm has code of ethics	45	57	75	82	85	87	89	89	88	88
Pr.4	Specific bylaw to govern board	62	72	75	80	81	82	81	82	83	84
Minority Shareholder Rights Index											
Sh.1	Annual election of all directors	24	22	24	24	26	28	28	28	28	27
**Sh.3	Freezeout offer to minority shareholders based on shares' economic value	100	100	100	100	100	100	100	100	100	100
**Sh.4	Takeout rights on sale of control exceed legal minimum	100	100	100	100	100	100	100	100	100	100
**Sh.5	Arbitration of disputes with shareholders	100	100	100	100	100	100	100	100	100	100
Sh.6	Firm has no authorized capital or provides preemptive rights	68	72	72	73	79	84	85	85	85	85
*Sh.7	Free float \geq 25 % of total shares	100	100	100	100	100	100	100	100	100	100
Disclosure Index											
*Di.1	Management has regular meetings with analysts	100	100	100	100	100	100	100	100	100	100
*Di.2	Firm discloses annual agenda of corporate events	100	100	100	100	100	100	100	100	100	100
**Di.3	English language financial statements	100	100	100	100	100	100	100	100	100	100
**Di.4	MD&A discussion in financial statements	100	100	100	100	100	100	100	100	100	100
Di.5	Annual financial statements on firm website	89	93	93	96	96	98	98	98	98	98
Di.6	Quarterly financial statements on firm website	90	94	96	99	99	100	100	100	100	100
Di.7	Auditor does not provide non-audit services	77	77	81	80	81	84	83	83	85	85
Di.8	Big four auditor	87	94	93	94	93	94	94	93	94	94
Di.9	Disclosure of executive compensation	29	38	38	37	68	96	96	96	97	97

Table 1. Description of elements and evolution of mean scores
Panel B: Level 1 and Regular listings

		Mean									
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Board Structure Index: Board Independence Subindex											
BdIn.1	Board includes one or more independent directors	19	19	19	20	24	25	26	26	27	28
BdIn.2	Board has at least 30% independent directors	9	8	8	8	11	14	15	18	18	19
BdIn.3	Board has at least 50% independent directors	4	3	2	4	5	7	6	8	11	11
*BdIn.4	CEO is NOT chairman of the board	65	71	71	70	69	70	67	69	68	68
Board Structure Index: Audit Committee and Fiscal Board Subindex											
BdCm.1	Audit committee exists	17	16	17	18	20	22	23	26	24	28
BdCm.2	Permanent or near-permanent fiscal board exists	61	62	62	61	62	61	60	64	67	67
BdCm.3	Company has either permanent fiscal board or audit committee which includes minority shareholder representative	38	38	39	43	45	43	46	47	40	41
Board Procedure Index											
Pr.1	Firm has system to evaluate CEO performance	34	37	39	39	40	42	42	43	43	42
Pr.2	Firm has system to evaluate other executives	17	19	21	23	24	28	29	30	30	30
Pr.3	Firm has code of ethics	30	31	36	38	43	40	41	41	41	42
Pr.4	Specific bylaw to govern board	44	52	54	57	60	60	63	67	68	68
Minority Shareholder Rights Index											
Sh.1	Annual election of all directors	28	26	25	26	29	28	28	29	29	28
Sh.3	Freezeout offer to minority shareholders based on shares' economic value	31	32	33	33	34	33	32	32	31	32
Sh.4	Takeout rights on sale of control exceed legal minimum	15	17	18	19	19	19	19	21	22	22
Sh.5	Arbitration of disputes with shareholders	14	15	15	16	15	14	14	15	16	17
Sh.6	Firm has no authorized capital or provides preemptive rights	71	73	71	73	76	78	79	78	79	79
*Sh.7	Free float \geq 25 % of total shares	52	48	51	55	56	54	51	54	54	54
Disclosure Index											
*Di.1	Management has regular meetings with analysts	25	27	26	26	27	27	26	27	27	28
*Di.2	Firm discloses annual agenda of corporate events	44	46	47	45	43	43	43	43	48	49
Di.3	English language financial statements	32	31	32	34	35	34	34	36	38	38
Di.4	MD&A discussion in financial statements	46	51	56	72	77	75	77	79	80	79
Di.5	Annual financial statements on firm website	74	78	84	89	91	92	93	95	95	95
Di.6	Quarterly financial statements on firm website	71	79	82	89	91	91	93	95	93	95
Di.7	Auditor does not provide non-audit services	84	87	87	88	89	91	92	93	93	94
Di.8	Big four auditor	62	66	64	63	63	61	62	62	63	62
Di.9	Disclosure of executive compensation	45	52	50	49	67	81	84	85	86	86

Table 1: Governance and non-governance variables

Note that in regressions, non-governance variables are defined as 3-year average (or shorter period if available)

Panel A: non-governance variable definitions	
ln(Tobin's q)	Ln(Market value of equity + book value of total liabilities)/(book value of total assets).
External Financing Need (EFN)	Difference between the 2-year geometric average growth rate in total assets minus the 2-year geometric average maximum sustainable growth rate, measured as $ROE/(1 - ROE)$ (or one-year if two-year data is not available).
Ownership	Percentage of common shares held by the largest shareholder.
Tangibility	Fixed assets divided by total assets.
Size	Ln(total assets)
Leverage	Total debt divided by total assets.

Panel B: descriptive statistics

Table shows summary statistics for indicated variables over 2010-2019. Non-governance variables are winsorized at the 5% and 95% levels.

Variable	Mean	Median	S.D.	Min	Max
Governance variables					
BCGI	66	71	20	14	100
Board Structure subindex	56	58	25	0	100
Board independence subindex	56	50	32	0	100
Audit committee and fiscal board subindex	55	67	32	0	100
Board Procedures	60	75	30	0	100
Investor Rights	65	83	27	0	100
Disclosure	83	89	20	11	100
Non-governance variables					
ln(Tobin's q)	-0.12	-0.16	0.57	-1.37	1.28
EFN	-0.02	-0.01	0.19	-0.66	0.70
Ownership	0.41	0.36	0.22	0.12	1.00
Tangibility	0.22	0.19	0.20	0.00	0.70
Size ($\ln(\text{assets})$)	14.89	14.99	1.64	9.92	17.59
Leverage (debt/assets)	0.27	0.28	0.17	0.00	0.69

Table 2: Correlation matrix for non-governance variables

Pearson correlation coefficients for covariates used in regression models. Variables are defined in Table 1. Significant coefficients at the 5% level or better are in **boldface**.

	Tobins' q	EFN	Ownership	Tangibility	Size
EFN	-0.19				
Ownership	-0.01	-0.02			
Tangibility	-0.02	0.11	-0.01		
Size	0.03	0.01	-0.07	0.01	
Leverage	0.09	0.08	-0.01	0.16	0.33

Table 3: Evolution of corporate governance by firm quartile

Annual means of Brazil Corporate Governance Index (BCGI) scores by firm quartile, over 2010 to 2019. Sample includes all firms traded in each year (unbalanced sample). For firms that move from Regular or Level 1 listing to Level 2 or Novo Mercado listing, or vice versa, the firm is placed in the Panel that is appropriate for each year. Quartile groups are computed separately in each year

Quartile	BCGI Score					
	NM & L2		Change from 2010 to 2019	L1 & Regular		Change from 2010 to 2019
	2010	2019		2010	2019	
Worst (1 st quartile)	54	70	16	19	27	8
2 nd quartile	65	80	15	31	41	10
3 rd quartile	72	85	13	41	54	13
Best (4 th quartile)	81	92	11	61	73	12
Best minus worst quartile	27	22		42	46	
Observations	134	163		232	164	

Table 5: Governance change within lowest corporate governance quartile in 2010

Change from 2010 to 2019 in annual BCGI scores for firms within lowest quartile of BCGI scores in 2010, separately for NML2 and L1R firms. Governance level is measured in 2010. Sample is firms in lowest quartile in 2010 traded in both 2010 and 2019 (balanced sample). Average change in BCGI is measured for all firms in the indicated listing levels (NML2 or L1R).

	# of firms	BCGI score		Change from 2010 to 2019
		2010	2019	
Novo Mercado & Level 2 (NML2)				
Firms with below average CG change	5	54	62	7
Firms with above average CG change	29	52	79	28
Level 1 & Regular (L1R)				
Firms with below average CG change	22	20	25	5
Firms with above average CG change	19	16	35	19

Table 6: Predicting the level of corporate governance (BCGI) - Linear model

Coefficients from regressions with firm and year fixed effects. Independent variables are calculated as the three-year average (or available period if shorter) and defined in Table 1. Standard errors are clustered on firm. For firms that move from Regular or Level 1 listing to Level 2 or Novo Mercado listing, or vice versa, the firm is included in the regression columns that are appropriate for each year. *, ** and *** indicate significance at the 10%, 5% and 1% levels. Coefficients statistically significant at the 5% level or better are in **boldface**.

Sample period	2010-2019			2010-2014			2015-2019		
Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Listing	All firms	NML2	L1R	All firms	NML2	L1R	All firms	NML2	L1R
Ln(Tobin'q)	-0.146 (0.897)	-2.410*** (0.907)	1.174 (1.206)	-2.417* (1.438)	-4.515*** (1.549)	-1.662 (2.038)	1.467 (0.978)	-0.079 (1.008)	1.110 (1.419)
EFN	0.168 (1.208)	-1.216 (1.382)	2.370 (2.067)	-2.140 (1.732)	-1.400 (2.357)	-2.741 (1.894)	0.912 (1.491)	1.105 (1.702)	0.145 (2.543)
Ownership (%)	-6.460* (3.760)	-2.671 (4.129)	-2.104 (7.087)	-5.498 (4.406)	-3.143 (5.083)	-5.422 (7.139)	-5.674 (5.837)	0.235 (6.898)	-5.692 (6.542)
Tangibility	0.991 (5.429)	9.119** (3.514)	0.829 (4.985)	7.013** (2.732)	8.648** (3.856)	2.652 (3.820)	-7.295 (7.942)	3.565 (4.859)	8.614 (9.676)
Size	0.333 (0.671)	1.603** (0.743)	-2.144 (1.459)	2.329** (1.130)	3.287*** (1.139)	-0.553 (2.115)	0.716 (0.928)	0.935 (1.007)	-1.026 (1.598)
Leverage	-1.724 (3.535)	-3.265 (3.610)	0.162 (4.706)	-4.951 (5.134)	-5.118 (5.052)	-13.743 (8.968)	-5.341 (5.919)	-2.791 (3.674)	6.980 (5.563)
Constant	yes	yes	yes	yes	yes	yes	yes	yes	yes
year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
Firm fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
R ²	0.52	0.59	0.47	0.48	0.56	0.42	0.17	0.15	0.19
Firm-year obs.	2,265	1,252	1,013	1,078	598	480	1,169	719	450
# of firms	307	169	155	248	135	122	244	152	98

Table 7: Predicting changes in corporate governance (Δ BCGI)- Linear model

Coefficients from regressions with year and firm fixed effects. BCGI runs from 0-100. $StdBCGI_{t-1}$ is normalized BCGI in year $t-1$. Normalization is across all firms. Other independent variables are calculated as the three-year average (or available period if shorter) and defined in Table 1. Standard errors are clustered on firm. *, ** and *** indicate significance at the 10%, 5% and 1% levels. Coefficients statistically significant at the 5% level or better are in **boldface**.

Sample period	2010-2019			2010-2014			2015-2019		
Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Listing	All firms	NML2	L1R	All firms	NML2	L1R	All firms	NML2	L1R
Ln(Tobin'q)	0.233 (0.483)	-0.409 (0.670)	0.635 (0.686)	-1.721 (1.300)	-2.724 (1.758)	0.025 (2.083)	1.204** (0.488)	0.452 (0.631)	1.352 (0.893)
EFN	1.631** (0.753)	0.501 (1.061)	2.678** (1.099)	2.672 (1.713)	-0.518 (2.077)	6.376** (3.035)	1.087 (0.992)	0.645 (1.652)	2.202 (1.334)
Ownership (%)	0.296 (1.607)	2.033 (2.042)	-0.241 (3.104)	0.663 (3.924)	4.408 (5.010)	-4.372 (6.322)	2.500 (2.763)	1.993 (3.527)	3.786 (3.548)
Tangibility	-6.524*** (1.539)	-5.644* (2.875)	-8.223** (3.165)	-10.185*** (3.764)	-7.166 (5.191)	-16.196** (6.918)	-2.276 (2.998)	1.222 (4.788)	-9.186* (4.833)
Size	0.409 (0.392)	0.954* (0.535)	0.070 (0.648)	1.482 (1.223)	3.690** (1.624)	-1.382 (1.597)	0.241 (0.871)	0.864 (1.016)	-0.983 (1.308)
Leverage	-1.385 (1.712)	0.071 (2.501)	-1.701 (2.827)	-1.834 (5.345)	-2.989 (6.647)	1.488 (7.633)	-0.485 (2.490)	4.874 (5.481)	-3.698 (4.634)
Constant	yes	yes	yes	yes	yes	yes	yes	yes	Yes
year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
Firm fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
R ²	0.10	0.12	0.11	0.05	0.07	0.08	0.05	0.08	0.06
Firm-year obs.	1,971	1,109	862	876	492	384	943	576	367
# of firms	296	166	141	245	134	115	227	143	89

Table 8: Predicting changes in corporate governance (Δ BCGI) – Probit fixed effects model

Outcome is dummy variable, defined separately for each year for improvement in BCGI_t relative to prior year. Coefficients from regressions with year and firm fixed effects. Other independent variables are calculated as the three-year average (or available period, if shorter) and defined in Table 1. Standard errors are clustered on firm. *, ** and *** indicate significance at the 10%, 5% and 1% levels. Coefficients statistically significant at the 5% level or better are in **boldface**.

Sample period	2010-2019			2010-2014			2015-2019		
Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Listing	All firms	NML2	L1R	All firms	NML2	L1R	All firms	NML2	L1R
Ln(Tobin'q)	0.103 (0.198)	-0.200 (0.285)	0.447 (0.307)	-0.531 (0.431)	-1.092** (0.524)	0.578 (0.848)	1.256*** (0.388)	0.849 (0.542)	1.282* (0.753)
EFN	0.581** (0.295)	0.144 (0.435)	1.320*** (0.457)	0.494 (0.654)	0.372 (0.877)	1.180 (1.090)	0.846 (0.710)	0.281 (1.199)	1.543 (1.052)
Ownership (%)	-0.533 (0.688)	-0.201 (0.997)	-1.328 (1.134)	-3.508** (1.685)	-2.403 (2.162)	-5.014* (2.757)	2.009 (1.693)	2.152 (2.294)	1.934 (2.775)
Tangibility	-2.227*** (0.645)	-0.941 (1.290)	-3.844*** (1.153)	-3.825** (1.627)	-2.210 (2.275)	-7.321*** (2.715)	-1.349 (2.418)	-0.521 (3.481)	-0.293 (4.526)
Size	0.056 (0.137)	0.240 (0.167)	0.156 (0.289)	0.343 (0.404)	0.982** (0.458)	-0.325 (0.861)	0.153 (0.515)	0.830 (0.713)	-1.941 (1.296)
Leverage	0.755 (0.654)	0.039 (0.804)	1.914* (1.132)	0.667 (1.554)	0.885 (1.827)	1.678 (3.037)	0.082 (1.595)	-0.038 (2.154)	1.691 (3.500)
Constant	yes	yes	yes	yes	yes	yes	yes	yes	Yes
year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	Yes
Firm fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
Firm-year obs.	1,830	1,058	762	736	434	296	598	380	213
# of firms	235	138	104	190	113	77	126	81	46

Figure 1: Number of firms between 2010-2019

Number of firms listed in Novo Mercado and Level 2, and Level 1 and Regular. Firms that move from Regular or Level 1 listing to Level 2 or Novo Mercado listing, or vice versa, are included in the group appropriate for each year. See Appendix for more information on sample information.

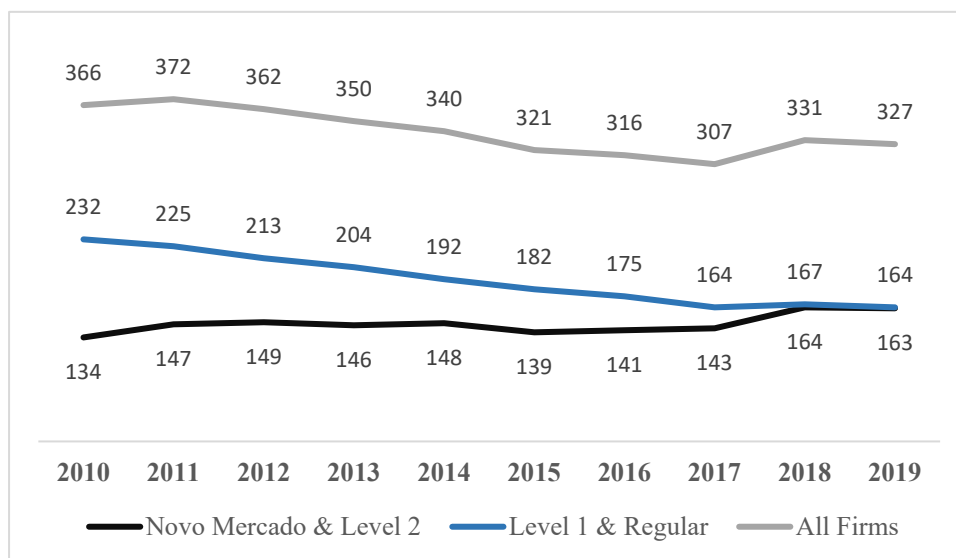


Figure 2: Evolution of BCGI Levels Over 2010-2019

Annual means of corporate governance scores for Brazil Corporate Governance Index (BCGI), separately for Novo Mercado and Level 2 firms, and for Level 1 and Regular firms. BCGI is scaled to run from [0,100], where zero (100) represents bad (good) corporate governance. Sample includes all firms traded in each year on the indicated levels (unbalanced sample). Firms that move from Regular or Level 1 listing to Level 2 or Novo Mercado listing, or vice versa, are included in the group appropriate for each year. See Appendix for more information on BCGI composition and sample information.

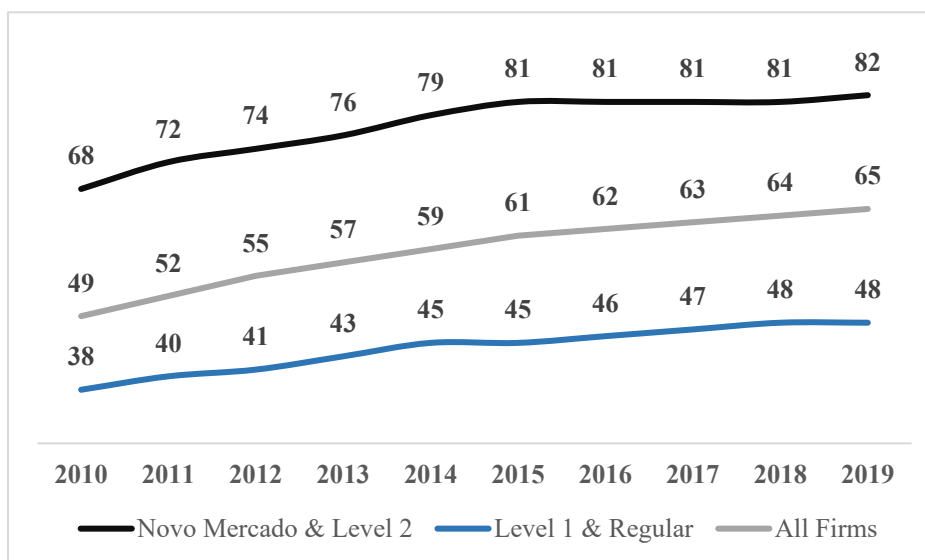


Figure 3. Histograms of BCGI for NML2 and L1R in 2010, 2015 and 2019.

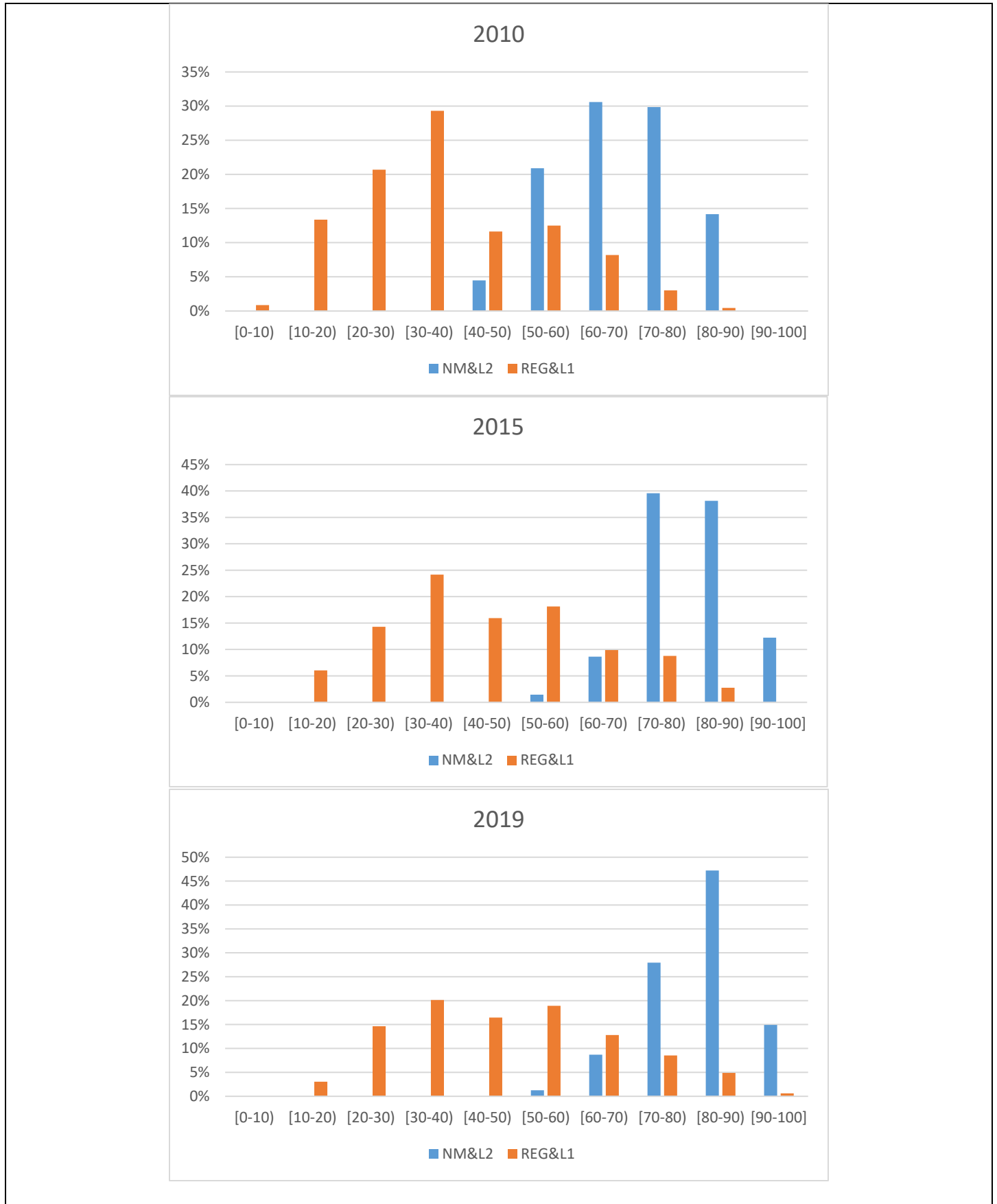


Figure 4. Annual Changes in BCGI Levels

Histograms of annual changes in BCGI for all firms, NML2 firms, and L1R firms. Sample includes firms which delisted in later years.

