Minority Shareholder Empowerment and Board Gender Diversity[1]

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Abstract

I study whether minority shareholder empowerment, enabled by the remote voting adoption, impacts board gender diversity through greater foreign shareholder participation and influence. I constructed a unique governance and activism dataset, including administrative and hand-collected data. In a natural experiment setting, the Difference in Differences approach estimates that the mechanism increased the voting turnout in 8 p.p. in the first year of adoption. The reform also allowed the creation of more monitoring committees. 98% of the users are international investors. Analyzing the investing patterns of four of the biggest funds and corporate diversity pushers world-wide, I find that they enhanced considerably the number of invested companies, starting during the remote voting adoption. There was also an increase in the presence and voting participation of pension funds and sustainability-driven investors at general meetings. Mainly, I document an increase of approximately 3 p.p. in the percentage of women on boards, representing nearly 50% of the pre-adoption ratio of female directors. Foreign investors support for female directors during board elections increased six times, migrated from male directors. The results have several policy implications related to minority shareholder engagement and corporate governance structures. In particular, they provide evidence on the potential of the participation of international investors with universal ownership as a mechanism to reduce the gap in the quality of governance practices between developed and emerging economies and address strategies to enhance corporate board gender diversity other than quota-related regulations.

Keywords: corporate governance; shareholder activism; minority institutional investors; remote voting; board gender diversity.

JEL Classification: G23, G30, G34, G38, M14.

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1. Introduction

The empowerment of minority investors is a relevant, under-studied corporate governance mechanism. The engagement of institutional shareholders, especially international investors from environments with stronger shareholder rights such as the U.S. and Europe, allows the implementation of better governance practices as it challenges the management decision-making *status quo*. Thus, policy makers in countries with weaker governance and high ownership concentration should provide channels to enhance minority participation and voting. Nevertheless, it is unclear how foreign investors reshape the governance structure in their invested companies, specifically, the boardroom.

An essential component of corporate governance is shareholder representation in the board of directors. If the influence of investors on directors' elections is weak, so will be the link between owners and managers (Cai, Garner, & Walkling, 2009). Fos, Li and Tsoutsoura (2018) find that shareholders pay attention to directors' elections, and such scrutiny have relevant implications for corporate governance. Shareholders, thereby, use voting as a channel of communication with the boards of directors (Yermack, 2010). The analysis of how boards affect corporate polices might be particularly relevant in emerging markets because boards of directors may be more easily captured by management and controlling shareholders in such environments (Giannetti et al., 2015).

The duty of the board of directors, especially monitoring, may depend largely on the characteristics of the directors (Adams, Hermalin, & Weisbach, 2010). Arguably, the demographic aspect of the board that has been receiving significant research attention is gender. Although there's mixed evidence in the literature on the impact of board gender diversity on firm value, the prevailing perspective holds that women directors can

diversify the set of boards' expertise more than do their male counterparts, bring unique skills to corporate boards and enhance boards' advisory effectiveness by contributing diverse skills (Kim & Starks, 2016). Moreover, the presence of female directors is evidenced to increase both social and environmental performances (Ginglinger & Gentet-Raskopf, 2021; Hsu, Li, & Pan, 2022). Importantly, Marquardt and Wiedman (2016) find that companies with low board gender diversity attract activists. Regarding the profile of investors, they evidence that both financially and socially driven activists are successful in enhancing gender diversity in target firms and without the need of a formal shareholder proposal.

I use the implementation of the remote voting in the Brazilian stock market, as a mechanism for enhancement of minority shareholder empowerment, to observe how they reshape the boardroom. Specifically, I study the role of foreign investors as the sub-group of minority shareholders that is most likely to lead engagements in the wake of the introduction of the remote voting mechanism. This is reinforced by the historically passive behavior of Brazilian institutional investors. In addition, the incentive to participate provided by the remote voting rule should be stronger for international investors, since domestic shareholder face lower costs to attend general meetings in person.

In this context, foreign shareholders might be able to bring better governance practices to the Brazilian corporate governance environment and influence Brazilian minority investors towards a more active behavior. There's evidence that institutional investors promote good corporate governance practices around the world. Moreover, institutional investors affect not only which corporate governance mechanisms are in place, but also their outcomes (Bena et al., 2017; Aggarwal et al., 2011). Accordingly, Maranho, Bortolon and Leal (2020) describe that minority investors should not construe

domestic institutional investors as evidence of strong external monitoring in Brazil. On the other hand, foreign institutional investors seem to have a positive impact on the governance practices of companies.

There were in recent years a series of coordinated statements among key shareholders to signal consistently the movement towards sustainable and responsible investing, such as: (i) nearly 2,000 CEOs have pledged to advance diversity, equity and inclusion (DEI) actions within their firms (PwC, 2021); (ii) more than 3,000 investors in 2020 signed the United Nations' Principles for Responsible Investment (UNPRI)[3] network, committing to incorporate ESG issues into investment analysis, decision-making processes, and ownership policies; and (iii) in 2019, nearly 200 CEOs that compose the Business Roundtable issued a statement[4] as to redefine the purpose of American corporations in order to serve all of the society, embracing a commitment to all stakeholders, presented as customers, employees, suppliers, communities and, then, shareholders.

One of the main examples of the influence of foreign shareholders in their invested companies' governance structure is the enforcement of greater board diversity. Major investors have targeted specifically such issue. Since 2017, BlackRock, Vanguard and State Street, the 3 biggest institutional investors world-wide ("The Big Three") launched campaigns encouraging companies to increase board gender diversity. Gormley et al. (2022) studied such setting and estimate that their voice led firms to add at least 2.5 times as many female directors in 2019 as they had in 2016. Another major investor, Norges Bank Investment Management (NBIM), the world's largest sovereign wealth fund, required that their invested companies to have at least 30% of female board members.

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[3] https://www.unpri.org/pri
[4] See: https://opportunity.businessroundtable.org/wp-content/uploads/2020/06/BRT-Statement-on-the-Purpose-of-a-Corporation-with-Signatures.pdf

Using this setting, Liang and Vansteenkiste (2022) find positive returns for firms with a female director shortage, especially in firms with low institutional ownership. Such effort to enhance board gender diversity might influence other shareholders as well as other environments. Therefore, I analyze whether those waves of investor engagement towards better governance practices can lead to a more gender diverse boardroom in Brazil.

Given the scope of my research, I delineate three research hypotheses. First, the expectation is that the remote voting implementation leads to greater minority shareholder participation. In a context with high ownership concentration, an easier way to engage may positively affect minority engagement:

H1: Remote voting increases minority shareholder participation.

Additionally, due to the historically low level of activism from Brazilian minority shareholders, and mainly, the significant reduction of voting costs of international investors provided by the remote voting reform, it is expected that international investors lead the remote voting usage:

H2: Remote voting increases foreign shareholder participation more than domestic shareholder participation.

Finally, with the possibility of foreign shareholders bringing corporate governance expertise and better practices, it is expected that they target the issues that are the most dissonant from an international high-level standard of corporate actions. Given the enforcement through world-wide campaigns by lead investors and the low levels of board gender diversity, it is expected that the minority shareholder empowerment provides more opportunities for female directors in Brazilian companies:

H3: Remote voting increases board gender diversity.

I find that the remote voting increased the voting turnout by approximately 8 p.p. in the first year of adoption, which exceeds a 10% increase compared to the average pre-adoption quorum. Regarding the profile of remote voting users, 98% are foreign investors. There has been a 1 p.p. increase in the ownership holding of major foreign institutional investors during the remote voting adoption. I also analyze the investing pattern of four of the biggest funds in the world, and arguably the main pushers for corporate diversity among investors internationally. From 2017 on, the Big Four enhanced considerably both the number of invested companies and the number of shareholder-company observations, as they have an overlap of around 45% of invested companies. Voting reports and minutes reinforce the presence and considerable participation increase of foreign investors, pension funds and sustainability-driven shareholders at general meetings.

Mainly, the remote voting implementation increased the percentage of women on board by approximately 3 p.p., representing nearly 50% of the pre-adoption ratio of female directors. Furthermore, I find that the remote voting adoption increased in around 10 foreign fund votes in support of female directors, where the pre-adoption average for the treated companies was 1.75 foreign votes, representing a 6-time increase. There was also a shift of preference of foreign investors from male directors to female directors. This research has several policy and regulatory implications. First, minority shareholder empowerment strategies, such as remote voting, can lead to significant improvements in corporate governance practices. Second, fostering the participation of international investors, especially the ones with universal ownership, can influence positively the invested market as they reduce the gap of the quality of governance practices between developed and emerging economies. Third, government-mandated female quota in boardrooms can be associated with a deterioration in firm value due to short-term

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undersupply of qualified women candidates (Hwang et al., 2021). The remote voting might be a better option because it allows for the organic adjustment of the market for female directors, thus potentially avoiding other quota-related side effects, such as overboarded female directors.

Finally, to the best of my knowledge, this study is the first aiming to provide a causal link between minority shareholder empowerment and board gender diversity. Furthermore, the hypothesized mechanism enabling this connection, namely, the threat of engagement by foreign shareholders taking advantage of a remote voting procedure, has not been investigated yet. Regarding the research data, I built a unique and rich dataset, including administrative and hand-collected data, information from domestic and international platforms, and data with a high level of detail, in firm-, director- and shareholder-level. Furthermore, this research addresses the ongoing debate on the challenges regarding the connection of international investors and the casting of their votes once regulators around the world must improve the ability of shareholders to vote and that global investors should be able to cast their votes efficiently (Iliev et al., 2015).

2.   Related Literature and Remote Voting Adoption

Historically, the behavior of minority shareholders has been passive in most countries, including Brazil, possibly due to characteristics of their ownership structure, such as the prevalence of defined control and high ownership concentration (Sternberg, Leal, & Bortolon, 2011; Claessens & Yurtoglu, 2013; Judge, Gaur, & Muller-Kahle, 2010; Punsuvo, Kayo & Barros, 2007). Besides, research on shareholder activism in emerging markets is rare or absent (e.g., Chung & Talaulicar, 2010; Claessens & Yurtoglu, 2013).

Nevertheless, such structural barriers to activism might be retreating. As described by Guimaraes et al. (2019), ownership concentration has decreased in the Brazilian

market due to the emergence of hybrid ownership structures and the requirements to list only voting stock (related to the highest stock exchange listing segment). These changes lead to a greater possibility to identify and investigate the shareholder activism in the Brazilian context. Furthermore, as argued by Chung and Talaulicar (2010), the phenomenon of globalization, especially in financial markets, was able to make shareholder activism, generally an Anglo-Saxon matter (Poulsen, Strand, & Thomsen, 2010), occur in other markets as well.

Recent research on shareholder activism and its impact in Brazil confirm this changing behavior. Leal, Carvalhal and Iervolino (2015) report improvements in the governance of Brazilian companies in general during the period from 2004 to 2013. In line with this fact, Vargas et al. (2018), Collares (2020) and Maranho, Bortolon and Leal (2020) find evidence consistent with the growth of activism in Brazil.

Pereira (2021) conducted extensive interviews with major Brazilian institutional investors to understand whether and how they engage and how it affects the Brazilian corporate governance. Pereira (2021) finds that (i) investors do not want to be seen as activists and prefer to call themselves "collaborative activists". Activism has a negative connotation since it is associated with confrontation, only large public pension funds use the term to describe their actions. (ii) Confrontation is avoided through prior scrutiny of companies' governance and activism is a reactive defense mechanism because investors do not believe it is effective when companies have clearly defined controlling shareholders. (iii) Brazilian independent asset managers do not believe activism is effective because of the large presence of defined controlling shareholders with over half of the voting capital. They do not see it as their roles to take action to induce performance or governance improvement other than what might be achieved by convincing management in the ordinary course of business in private meetings. (iv) Consciousness

of voting as a fiduciary duty is increasing among stewardship signatories but accountability is incipient. Collaboration on votes is becoming more common but it is neither frequent, regular nor with the same parties. Independent asset managers have voting policies in place and some enact such policies based on beliefs, habit or for relationship reasons. (v) Pro-active activism is limited to and primarily associated with public pension funds proposing candidates to board seats, requesting separate elections for minority or preferred shareholders, and requesting the creation of a supervisory council.

The Brazilian financial system has undergone significant reform in recent years. One example is the requirement of greater disclosure since 2010, increasing both the quantity and the quality of mandatory information disclosed by companies. There was also new regulation regarding proxy requests and voting. Another relevant change was the adoption of remote voting (Guimaraes et al., 2019).

In convergence with a scenario of over a decade of new regulation aiming to improve the Brazilian corporate governance landscape, the Brazilian Securities Commission (CVM) regulated and implemented, through Instruction 561 of 2015, a procedure for remote voting. As a channel with greater accessibility and lower cost, this mechanism allows shareholders to have a greater participation in the decisions placed at the general meetings by voting, submitting proposals or asserting presence, thus contributing to the improvement of governance mechanisms in the Brazilian market (CVM, 2014).

The regulation introduces the remote voting ballot form (form containing the matters to be voted), the possibility of inclusion of candidates and minority shareholder proposals, deadlines, and ways of sending the form, among other aspects. The adoption

of remote voting was optional in 2016 (only six companies adopted voluntarily), mandatory for companies included in the IBRX-100 and/or Ibovespa indices in 2017, and from 2018 onwards, mandatory for other publicly traded companies registered in category A (companies authorized to trade any public securities) and that have publicly traded stocks. The remote voting is not an electronic or online voting. Investors must fill the ballot form out and then return it to the company.

Over time, some countries allowed shareholders to vote electronically or by mail, such as France, Germany, Italy, the Netherlands and Spain (Network Briefing, 2017), as well as the United States (SEC, 2012) and China (Gao et al., 2019). However, in these countries, companies are not obliged to use such mechanism and corporate laws might hinder the use of online voting (Gao et al., 2019). With the exception of China (Gao et al., 2019), I have not found, in the literature of the countries mentioned above and others, studies that attempt to specifically investigate electronic or mail voting as a mechanism of investor activism and governance improvement. Gao et al. (2019) provide supportive evidence regarding this literature gap.

The remote voting mechanism enables greater participation while it might reduce the costs of the activist strategies (Guimaraes et al., 2019). The possibility of voting at a lower cost may foster the engagement of larger investors, as well as provide incentives to participate to smaller shareholders by decreasing the free-rider problem. More specifically, this research investigates the potential for minority shareholder empowerment caused by such reform. That is, minority shareholder activism enabled and empowered by the implementation of remote voting. Relatedly, it is relevant to observe whether it is possible to mitigate both agency problems: (i) minority shareholders and management and (ii) minority shareholders and controlling shareholders. In contexts with concentrated ownership and relatively weak governance, controlling shareholders may

have strong incentives and opportunities to divert corporate resources to their private interests (Jiang, Lee & Yue, 2010).

3. Identification strategy and methodology

3.1. Difference in Differences (DiD)

I outline a natural experiment exploiting the exogenous variation provided by the CVM requirements. The period before the mandatory remote vote will comprise a 6-year period (2011 to 2016) or a 3-year period (2014 to 2016) – this strategy was chosen due to the fact that most public corporate governance information about the Brazilian capital market started in 2010, and therefore, the first years of corporate governance disclosure might have flaws and certainly have missing values - and the post-treatment period is the year of 2017. The treatment group is composed by the companies that mandatorily adopted the remote voting in 2017. The companies that had to adopt mandatorily in 2017 are the firms included in the Ibovespa and/or IBRX-100 indices in the year when the regulation was published. The remaining companies comprise the control group.

The DiD model is shown below:

$$y_{i,t} = \beta_0 + \beta_1 Time_t + \beta_2 Indices_i + \beta_3 RemoteVote_{i,t} + \gamma^k X_{i,t}^k + DY + DF + \varepsilon_{i,t} \ (1)$$

where:

- y is the dependent variable, being in this analysis: voting turnout at AGMs, the percentage of women on board and the number of foreign votes supporting directors given their gender;

- $Time$ is a dummy variable equal to 1 in the year 2017 and 0 during the 3-year or 6-year period;

- *Indices* is a dummy variable equal to 1 for companies included in the Ibovespa and/or IBRX-100 indices and 0 otherwise;

- *RemoteVote* is a dummy variable resulting from the interaction of *Time* and *Indexes*. β_3 represents the effect of remote voting on each dependent variable y, for each company i and year t;

- X^k represents the vector of k possible control variables, for each company i and year t.

- DY is the year fixed effects, DF is the firm fixed effects and $\varepsilon_{i,t}$ is the error term.

The parallel trends assumption is the main identifying assumption of the Difference in Differences strategy. If the parallel trends assumption does not hold in the baseline model (i.e., the regression including only *Time*, *Indices*, and *RemoteVote*), it is relevant to control for the variables that may lead to the differential trending of the treatment and control groups. According to Goranova et al. (2016), the literature points to potentially useful control variables in activism studies, namely: profitability, industry, liquidity, and leverage.

In addition, in a setting with multiple pre-treatment periods, it might be helpful to use a linear control to capture the unparallel evolution regarding both groups. Technically, this approach allows the possibility of heterogeneous trends. Therefore, in a setting with firm and year fixed effects, there could be added in equation (1) the following control variables: $LinearControl_t$, where year 1 = 1, year 2 = 2, …, year N = N, and the interaction between $LinearControl_t$ and $Indices_i$, leading to the main control variable $HeterogeneousTrends_{i,t}$ (Wooldridge, 2021).

3.2.   Regression Discontinuity Design (RDD)

To identify the causal effect of the remote voting implementation, I will also apply a Regression Discontinuity Design. In this research, the discontinuity relates to the inclusion or not of companies in the IBRX-100 Index in 2017, since being part of the IBRX-100 and/or the Ibovespa Index were the criteria determined by CVM for the mandatory adoption of the remote voting mechanism in the first year (2017). IBRX-100 is composed by the 100 stocks (tickers) with the highest Trading Index (a continuous Index computed by the São Paulo Stock Exchange (B3), that takes into account the number of trades and the volume of trading). Thus, the Trading Index is the running variable in my approach. It is worth noting that 94 companies were forced to adopt (instead of 100) because some companies had two tickers in this index. In addition, all companies included in the Ibovespa index were also included in the IBRX-100 index.

The critical identifying assumption is that the companies whose Trading Index are immediately below the threshold for the inclusion in the IBRX-100 index are comparable to the those whose Trading Index are immediately above the same threshold. That is, companies cannot precisely manipulate their assignment in the IBRX-100 index in order, for example, to bypass the CVM regulation. I could then compare treated (i.e., mandatorily adopting remote voting) and untreated companies with similar Trading Index. Therefore, the reduced-form RDD model can be stated as follows:

$$Y_i = \tau(T_i \geq c) + \rho(T_i) + \varepsilon_i, \tag{2}$$

where Y_i is the dependent variable; T_i is the company i's Trading Index; c is the threshold (i.e., the minimum Trading Index for inclusion in the IBRX-100 index), that is, $(T_i \geq c)$ is a dummy variable equal to 1 for companies that have a Trading Index equal to or greater than the threshold, and are therefore included in the IBRX-100 Index (composing the

treatment group) and 0 otherwise; ρ is a nonparametric function and ε_i is a random term. ρ captures the systematic relationship between the Trading Index and the outcome of interest and the coefficient τ represents the discontinuity in this relationship around the 94th company's Trading Index. That is, τ is the effect of being included in the IBRX-100 and therefore of being obliged to adopt the remote voting.

4.   Data, Sample and Setting

By 2019, 334 companies had adopted the remote voting mechanism. All 2017 adopters complied correctly. 27 companies were excluded by voluntary adoption, interrupted use and/or late adoption, as reported in Table 1. After that, I ranked all companies by the Trading Index (TI) to observe whether there would be an overlap between treatment and control groups, and only 1 company from the treatment group had a TI score that did not match their group by being after the 88th company with the control companies, and, thus, was excluded.

One important concern from this type of research design is that treatment and control groups might significantly differ in ways that hinder the identification of the causal parameters of interest. I intend to show that, in terms of corporate governance structure, both groups can be made comparable. Using the properties and characteristics of the data and companies of the sample, I propose to use suitable sub-samples as control groups in order to mitigate the heterogeneity between treatment and control groups. Although the implementation through index companies has a size and liquidity bias, I argue that the following 88 companies can be used as a comparable control group.

There are 6 levels of corporate governance listing segments in the Brazilian market, from the basic level, where what is required is essentially the Brazilian corporate law, to the highest level called Novo Mercado. Intermediate levels (i.e., Bovespa Mais,

Bovespa Mais Nível 2, Nível 2 and Nível 1) intend to accommodate the different characteristics and profiles of the listed companies. The mandatory rules of the Novo Mercado include ownership structure with only voting shares, 100% Tag Along, at least 2 or 20% of independent directors, at least 25% free float or 15% average daily trading volume and simultaneous disclosure in English and Portuguese of relevant information.

Ranking only by the Trading Index, as a liquidity measure, I show in Table 3 that the first 88 companies from the control group have a similar structure in terms of governance listing segments compared to the mandatory treatment group (e.g., 60% of each group are Novo Mercado companies). As importantly, it is worth noting how different governance-wise is the remaining set of non-treatment companies, with more than 90% of them applying only to the corporate law. Including these companies in the control group could therefore hinder the identification of the effect of the remote voting.

5.   Empirical analysis

5.1.   Shareholder participation and remote voting

The cornerstone analysis of the remote voting implementation regards whether and how the mechanism increased the voting turnout. If there's no change in the voting turnout, one could assume that there has been no interest from shareholders to engage even with a costless channel to vote. Therefore, the variation in voting turnout represents the first indicator of the remote voting effectiveness.

I have empirically analyzed the minority shareholder participation, that is, voting turnout (quorum) at the mandatory general meeting, where the most important matters are usually discussed, including distribution of profits, compensation package and board elections. In a context with high ownership concentration, it is possible to assume that any relevant variation in the AGMs quorum represents the voting turnout of minority

investors. Therefore, the first-year effect is a possibility to observe whether the remote voting was used to empower minority investor.

I find consistent evidence that the remote voting implementation increased shareholder participation, thus becoming a potential mechanism for minority shareholder empowerment. Using a variety of settings, samples, control groups, pre-treatment periods, and control variables, I estimate that the mechanism is able to enhance the overall participation in general meetings by about 8 p.p. considering the companies that adopted the remote voting in the first year of implementation (2017), as shown in Table 4.

From the 88 companies of the treatment group, 16 companies did not receive any remote voting ballot form from their investors. If the remote voting has a real effect on the outcome, it is reasonable to expect that, when analyzing the 72 companies that have the most engaged investors (RV users), there will be stronger results compared to the ones with the full treatment group. Interestingly, with companies that have remote voting users, the effect has a greater coefficient (8.2 p.p. versus 7.47 p.p.) as well as with greater statistical significance.

It is also worth noticing that the high level of ownership concentration preconized by the literature and anecdotal evidence are confirmed in my estimates. The average quorum pre-adoption is around 68% for the treatment group, thus, the remote voting effect increased more than 10% on average, with the possibility to reach 15% of participation enhancement. These results are even more meaningful when observing that this increase is due to minority shareholder participation (given that the controlling shareholders vote every year). The quorum pre-adoption for the control group is considerably higher, as one would expect, averaging 78%, ranging from 75% with Novo Mercado companies to 83%

with the full sample, another compelling evidence of the ownership concentration in the Brazilian market.

Related to the voting rates in the AGMs' matters, although most treated companies in the first year of adoption did not have such items approved by unanimity, presenting some level of dissident voting, approval percentages remain high. For instance, considering one of the most controversial matters, the management compensation package, it had around 94% of approval on average. This reinforces the argument that minority investors use their voting right, fostered by the remote mechanism, primarily as a threat of engagement instead of a publicly confrontational instrument. The main reason is that creating a public fight with a steady controlling shareholder and management, despite working with them, may have a negative cost-benefit balance.

One of the possibilities brought by the remote voting ballot form is the installation of the supervisory council[5]. It is a body enabled by the Brazilian corporate law which has extensive powers to investigate the company's financial reporting and can state their opinion at AGMs. The supervisory council can be a permanent or temporary body. It is permanent when such provision is included in the firm's bylaws. Otherwise, it is temporary when created on demand by minority shareholders representing 10% of the common (voting) shares or 5% of the preferred (non-voting) shares. It expires at the next AGM, but the shareholder demand for the supervisory council can be renewed at that meeting.

Specifically, the Brazilian corporate law concedes the following rights regarding the supervisory council: (i) minority shareholders holding at least 10% of the voting shares have the right to elect one member; (ii) holders of preferred shares have the right

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[5] Supervisory council can be seen in the literature as fiscal board or a combination of those words: supervisory board or fiscal council.

to elect one member; (iii) the controlling group can elect the remaining members, in a number equal to those elected by minority shareholders plus one, and thus can control the supervisory council, if it chooses to; (iv) even if they are outvoted, minority shareholder representatives can demand to inspect the company's books, resulting in a possibility to harm the public image of the company's executives and controllers.

In Figure 1, I compare two monitoring bodies that differ in two core aspects: installation and subordination. The supervisory council is a body requested by minority shareholders and unsubordinated, whereas the audit committee is not requested by shareholders, being installed by and subordinated to the board. Using the evolution of the audit committee installation as a baseline, it is possible to observe that the number of supervisory councils created seems to have been directly impacted by the remote voting implementation, changing its historical level of around 150 companies to around 190 companies, which remained relatively constant from 2018 on. The number of audit committees has a linear growth but no spike in its evolution, as expected, since its creation should be unrelated to shareholder actions and the remote voting influence. As this analysis comprises the full sample, it is expected that most installations occur from 2018 on, the first year of adoption of more than 70% of the companies.

This is supporting evidence for the use of remote voting as well as of the argument of a non-publicly confrontational strategy of engagement. With a much less costly option to request the installation of a monitoring body, minority investors exerted their right swiftly. I argue that more than the effectiveness of the monitoring role of the supervisory council itself, the continuous request of installations symbolizes the vigilant presence and awareness of minority investors towards more accountable and less expropriating management and controlling shareholders.

5.2.   Foreign Investor Engagement

Regarding the number of voting ballots returned by investors, there was a steady increase overtime. Few ballots were returned in 2016 (optional adoption year). I show in Table 5 that there was an increase in 2017, as companies included in two stock exchange indices had to adopt the remote voting, and from 2018 there was a significant increase as all listed companies should be able to provide such voting channel to their investors. The trend from 2020 on was likely impacted by the Covid-19 pandemic, as it fostered remote participation.

Relatedly, the evolution of the number of shareholders that used the mechanism increased in a much lower rate. The core group of investors remain the same through the years. For example, comparing 2017 and 2018 as the first years of adoption, while there was an addition of more than 40,000 RV ballots returned, the increase in the number of investors participating was less than 500, resulting in a spike of used RV ballots per shareholder. That is, the same investors that could vote at a lower cost in 94 companies, later could vote in all their invested companies in Brazil.

Observing their voting behavior, foreign RV users utilize it approximately 20 times a year. It is important to mention that this average ratio cannot be directly related to the number of companies because Brazilian companies can hold more than one general meeting a year – the mandatory one by April, and others for discretionary matters. When isolating only the mandatory AGMs, nearly 4,000 ballot forms were used in 2017, and around 30,000 from 2018 onwards. Thus, the avid foreign remote voting user would vote for around 10 companies on average every year. There's a stable prevalence of foreign investors as the very main users of the remote voting mechanism, in accordance with our research hypothesis. Looking at which countries compose such percentages, US investors

are, with significant distance, the main users, followed by European minority shareholders.

Table 6 reports that investors from 29 different countries used the remote voting in 2017, 39 in 2018 and 2019, and 45 in 2020. In the period from 2017 through 2020, investors from 54 countries used this mechanism. Regionally, North America leads with 63.9% of the returned remote voting cards, with a relevant difference from Europe, with 23.2%. Asia and Oceania combined account for 9,1% of the remote voting usage. South America-based investors returned only 1.7% of the voting ballots during this 4-year period.

Analyzing the profile of investors that are using the remote voting as a mechanism of participation, Anglo-Saxon cultures prevail, where shareholder engagement is typically more frequent. Almost all the users of the remote voting are institutional investors. As hypothesized, due to the remote voting design and the reduction of participation cost for international shareholders, they are the key users of the mechanism. Brazilian minority investors, on the other hand, when they intend to participate, as the engagement culture in Brazil is underdeveloped, they rather attend AGMs in person.

When analyzing international shareholders who regularly cast their votes, the remote voting implementation increased in over 1 p.p. the combined voting ownership of foreign minority investors in Brazilian companies during the first year of adoption. Such finding is meaningful once major global institutional investors decide to increase their portfolio of voting shares, rather than preferred share or no increase at all, in a highly concentrated market. It is an indicative that they aim to have their voices heard and make changes in governance through voting, and the remote voting was the channel they instrumentalized to engage.

It is possible to reinforce anecdotally this key evidence by looking at the most publicly engaged universal ownership investors at the global stage: BlackRock, Vanguard and State Street in the United States and Norges Bank Investment Management, the world's largest sovereign wealth fund, in Europe. Henceforth called Big Four, reference to the well-known Big Three, in addition to Norges.

Those funds are well-established in publicly addressing the need to provide better corporate governance practices as well as enforce their campaigns upon their portfolio companies. The remote voting, consequently, is a strong possibility to foster such engagement pattern. Regarding their investment strategy in Brazil, it is noticeable that both treatment and control groups evolve very similarly, the spike in both curves happens in the first year of adoption of the mechanism for each group and, after the implementation, there's a significant increase in the amount of invested companies by those four major shareholders, reaching the peak of 100 companies in 2020, as shown in Figure 2.

Furthermore, it is worth mentioning that the percentage of voting shares held by the Big Four enhanced through time, fluctuating between 2% (before the adoption) and 3% (after) of the voting ownership structure on average at a fund level (not their combined ownership at a firm level). In this context, it is possible to argue that the efficacy of minority shareholder engagement is not necessarily related to the size of the position, especially in Brazil with high levels of controlling ownership, where having a bigger position might not symbolize greater power as they would remain being outvoted. Instead, in an environment like the Brazilian, it might be a better strategy to hold a significant position and engage parsimoniously with management while maintaining the threat of dissident voting and negative public campaign, in this case, fostered by the remote voting mechanism.

Lastly, there is a relevant level of overlap regarding the target companies of the four funds, as reported in Figure 3. On average, more than 45% of the target companies have more than one out of the four universal shareholders. Therefore, their joint ownership and effort to enforce policies with similar goals, being coordinated or not, can also catalyze the outcomes towards better corporate governance practices.

5.3.   Board Gender Diversity

In addition to the attention that more gender-diverse boardrooms have been receiving both by investors and CEOs aiming to signal socially-engaged actions world-wide and in Brazil, Brazilian society and media[6] have been increasingly focusing on the debate regarding the lack of women on leadership and decision-making positions as well as the recent enhancement in such low numbers. Another example of this attention refers to government actions. Legislative drafts involving gender quotas were presented to the Brazilian congress, but they are still under review by the lower chamber's committees. The most advanced gender quota-related draft is a senate law project presented in 2010[7], mandating a gradual three-step adoption for state-owned public companies, which must have at least 30% of female directors by the end of the third year. This law draft (PL 7179/2017) has been approved in the higher chamber in 2017, and it is under scrutiny in the lower chamber – its current status[8] is awaiting the designation of a congressperson sponsor in the lower chamber labor committee.

Since the beginning of the decade of 2010, there has been several corporate governance improvements in the Brazilian capital market and the discussion of a more

[6]https://valor.globo.com/carreira/noticia/2023/03/16/mulheres-ocupam-152-dos-cargos-em-conselhos-e-diretorias.ghtml
[7]https://www.camara.leg.br/noticias/520758-projeto-fixa-cota-de-30-de-mulheres-em-conselhos-de-administracao-de-empresas-publicas
[8] https://www.camara.leg.br/proposicoesWeb/fichadetramitacao?idProposicao=2126313

diverse board and management fits in this context. The Brazilian regulator (CVM) and the Brazilian Stock Exchange (B3)[9] are open to public hearing in order to draft an instruction for companies to increase "diversity in leadership". The initial proposal states that companies must have at least one woman and one minority group (black, disabled or LGBTQIA+) as a board member or a member of the management team.

I argue that policies aimed at structurally enhancing the corporate governance environment might be more impactful to address specific contingent topics such as board gender diversity compared with specific straightforward regulation such as gender-related quotas. First, because shareholders have a distaste of government interventions, as described by von Meyerinck et al. (2021), who find large negative announcement returns to the quota adoption for California firms. Ahern and Dittmar (2012)[10] document a decline in Tobin's Q, less experienced boards, increases in leverage, and reduction in operating performance. Second, there might not be a sufficient supply of qualified female directors to fulfill the abrupt demand increase caused by quota regulation (Ahern & Dittmar, 2012; Greene, Intintoli & Kahle, 2019; Hwang, Shivdasani, & Simintzi, 2021). Third, quota policy implementation can have other unintended consequences on the female directors themselves. Tonetto (2022) finds an increase in companies with overboarded female directors, after the California Senate Bill adoption. Importantly, she documents that overboarded female directors are associated to lower environmental and social scores. Fourth, when targeting structural corporate governance issues, there might be several ramifications as positive consequences.

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[9] https://www.b3.com.br/pt_br/noticias/audiencia-publica-asg.htm
[10] It is worth mentioning that the perspective of Ahern and Dittmar (2012) has been challenged by, for instance, Eckbo, Nygaard, and Thorburn (2021), who disagree with the empirical analysis, while finding insignificant announcement effects, and that the pool of women director candidates was large enough to match the demand.

The remote voting implementation is an example of a wider governance policy that can lead to different outcomes, including, for instance, greater monitoring, board independence, minority shareholder engagement, foreign participation, adoption of better and updated governance practices, as well as lower agency problems. Those potential outcomes, if sustained and nurtured, could lead naturally to positive ramifications such as board gender diversity, while the market adapts itself to new demands in its own pace.

Using the 88/88 approach to delimitate similar treatment and control groups in terms of governance structure, in Figure 4, I provide the evolution of the presence of female directors in Brazil. Generally, both groups evolve in a similar manner. The trend for the treatment group companies slopes significantly in their first year of adoption (2017), while the control group companies experience a sharp upward slope also in their first year of adoption (2018).

I hypothesize that the main drive, and thus the lead cause of variation, for this relevant change of curves' behavior is the minority shareholder empowerment enabled by the remote voting mechanism.

Using a Difference in Differences approach, stressed in several scenarios, I estimate that the remote voting implementation has an impact of around 3 p.p. on the percentage of women on board on average for one year of adoption, as described in Table 7. Given that the average pre-adoption ratio of female directors is approximately 7%, such increase represents nearly 50% of improvement. These results suggest that allowing greater minority shareholder engagement, mainly by international investors, can have a positive influence on corporate governance practices, such as significantly increasing the participation of females in directorships.

I also provide supporting evidence for the main findings when analyzing (i) only remote voting users as treatment group, (ii) using Latin American companies as control group and (iii) utilizing a 5-year post-treatment period. First, using as treatment group only companies that had engaged investors that voted with the remote voting mechanism, the results not only hold, but also are stronger (72 remote voting company users with 3,4% versus all 88 treated companies with 2,9%) and more statistically significant. Such findings reinforce the claim that the remote voting causally influences the increase in board gender diversity. Second, I attempt to mitigate concerns over the suitability of the control group by using Latin American (excluding Brazil) companies as counterfactuals. The DiD estimates remain very similar, corroborating the previous results. Third, the use of Latin American companies in the control group allows to explore a longer post-treatment period (which is not possible using only Brazilian companies due to the 2-step implementation of the mandatory remote voting scheme). I also use a 5-year post treatment period and the outcomes remain around 3 p.p., in line with all regressions and variations.

Compared to developed countries, the average of women on board in Brazil are still relatively low. For instance, countries[11] like Australia, Canada, Germany, Netherlands, Switzerland, United Kingdom, and United States had approximately 30% of the board members represented by women in 2019 and 2020. France and Sweden reach around 40%. On the other hand, Japan and India have a ratio of around 10% and 15%, respectively. Importantly, the average percentage of women on board for the sample of Latin American companies (Argentina, Chile, Colombia, Peru, and Mexico) in the 6-year pre-treatment period (2011-2016) is 6%, similar to Brazil. Therefore, another major role

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[11] Women on Corporate Boards (QuickTake) - https://www.catalyst.org/research

for the remote voting mechanism impact is to reduce the gap between Brazil and other nations where board gender diversity has been better addressed.

Lastly, women are particularly likely to join monitoring committees and exert such roles effectively (Adams & Ferreira, 2009; Schwartz-Ziv, 2017; Kim & Starks, 2016). Accordingly, I find a remote voting effect around 4% to 7% increase on the percentage of women as members of the supervisory council. Apparently, there has been a supervisory council reshape due to the reform. More supervisory councils were installed and maintained, including an increasing number of women among their members.

5.4. Foreign investors support for female directors

Investors can approve, reject or abstain when casting their vote for a director on board elections. I analyze the number of approval votes that female directors received by foreign investors on board elections at AGMs, as a measure of support to elect a female board member. I find that the remote voting adoption increased in around 10 foreign fund votes for female directors, where the pre-adoption average for the treated companies was 1.75 foreign votes, representing a 6-time increase. This result is strong direct evidence of the argument that the main driven of the increase in the proportion of women on board is the foreign investor engagement through the remote voting usage.

This evidence also represents a shift of preference of foreign investors from male directors to female directors. I show in Table 8 that the pre-adoption average for treated companies regarding foreign supporting votes for male directors was over 31 votes (around 18 times the pre-adoption average for female directors). There has been a decrease in the support of foreign investors for male directors. This is another compelling evidence of the direct effort of foreign shareholder to increase the female participation on Brazilian boardrooms.

A possible backdoor channel that could explain the increase in supporting votes is the increase of the voting flow itself, another outcome of the remote voting adoption. When controlling for the total votes received by the Brazilian companies, the findings remain statistically and economically significant. Therefore, international shareholders used the remote voting device to considerably enhance their support for placing a greater number of women directors and reshaping Brazilian boardrooms towards better governance practices and structures.

5.5. Voting Informativeness

One of the main governance shocks brough by the remote voting regulation was the increase in the both the number of voting reports required and the information content of them. Prior the regulation, specifically until 2015, the only publicly disclosed voting or any related report that companies provided was a overly summarized AGM minute, where it was described the law procedures, asserting that the minimum quorum was present to start the meeting, most of them stated the quorum (turnout) itself and, usually describing the outcome from four matters: (1) approval of financial statements, (2) distribution of profits and dividends, (3) management and board compensation and (4) board election. Most companies only described that if a given matter was approved by unanimity or by majority.

After the regulation, companies had to disclose: (1) extended detailed AGM minute, (2) remote voting ballot form that is sent to investors 30 days before the meeting and is expected to be received until 7 days before the meeting, (3) consolidated remote voting map, showing the results specifically from the remote voting users, (4) detailed final voting map, where companies describe how each shareholder voted, identified with the first five number of their identifier number and (5) synthetic final map, presenting

how each matter was voted, the number of shares that voted for, against or abstained. It is worth noting that companies usually have other meetings throughout the year, where they vote matters that are out of the usual scope of the AGM. The AGM in Brazil is called ordinary general assembly, happening until April and the second type of meeting is usually called extraordinary general assembly. For the extraordinary AGM, companies have to disclose precisely the same new required voting reports.

This is the second major informational governance shock in the Brazilian market. The first one happened in 2010, where companies had to disclosed most of their governance data and structure in a standardized format. The number of new requirements was the main reason that the Brazilian regulator changed the law 7 months after its publication postponing in one year the adoption for each group. The first-year adopters, changed from 2016 to 2017. And the second-year adopters, changed from 2017 to 2018. The law update turned out to be particularly useful once all first-year adopters complied correctly and on time.

Once the AGM minute was the item disclosed before the adoption, such report becomes a good measure of the quantity and the quality of the changes in voting informativeness. Regarding the full sample, from 2010 to 2022, there has been around 87 thousand words and its variations, adding up to 14.5 million words in total. I use the number of characters as a measure of the size of the voting report, that is, the amount of letters, numbers, and others, except spaces of the document. For the treatment group, comparing before and after adoption, the amount of information increased in more than four times. For the control group, it almost doubled. Therefore, the remote voting implementation directly impacted the size of the information content of the main voting report of the Brazilian market, as shown in Figure 5.

The remote voting also impacted the mentions of relevant topics such as foreign investors (Figure 6), pension funds (Figure 7) and responsibility (Figure 8). I call mentions the average number of words in the AGMs minute per firm-year. The mentions of foreign investors more than doubled, here considering BlackRock, Vanguard, State Street, Norges, Fidelity, Voya, Lazard, Rowe and Wisdomtree. Mentions of pension funds tripled after the remote voting adoption. This is particularly relevant because pension funds historically are the only source of activism in Brazil. Lastly, comparing before and after the remote voting, mentions related to responsibility increased in more than four times, in this case, including words such as ESG, green, responsibility and sustainable. Thus, the content, mainly due the presence of new investors, has been reshaped. It is important to point out, nevertheless, that those figures do not represent necessarily the presentation and inclusion of new minority proposals but that the investors that participated in a given meeting have those keywords as investment strategy and/or fund profile. Finally, the influence of the United States and its investors is also noted, having several states and cities being namely mentioned such as Arizona, California, Connecticut, Delaware, Idaho, Illinois, Minnesota, Ohio, Philadelphia, Texas, Wisconsin, Wyoming and New York. The interest of American shareholders in investing in Brazil is geographically widespread in the United States.

5.6.   Robustness

I use a Regression Discontinuity Design[12] model to provide another causal approach for estimating the effect of the remote voting implementation on the percentage of women on boards. I find statistically significant results that corroborate the Difference in Differences estimates. As a parameter of comparison, a RDD linear estimation would

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[12] See Appendix A for the Regression Discontinuity Design analysis.

provide an effect of around 4 p.p, within the range of the DiD findings. Although the results slightly differ in terms of magnitude, they confirm the previous outcomes in terms of direction and statistical significance.

6.   Concluding Remarks

I designed a natural experiment using the remote voting implementation in Brazil to study whether minority shareholder empowerment impacts board gender diversity. I hypothesized that greater foreign shareholder participation influences Brazilian companies towards better corporate governance practices and structures such as gender-diverse boardrooms. I find that the remote voting increased the voting turnout by approximately 8 p.p. in the first year of adoption, which exceeds a 10% increase compared to the average pre-adoption quorum. Moreover, the reform may have caused the creation of more monitoring committees. Regarding the profile of remote voting users, 98% are foreign investors. I also analyze the investing pattern of four of the biggest funds in the world, and arguably the main pushers for corporate diversity among investors internationally. From 2017 on, the Big Four enhanced considerably both the number of invested companies and the number of shareholder-company observations, as they have an overlap of around 45% of invested companies. Voting reports and minutes reinforce the presence and considerable participation increase of foreign investors, pension funds and sustainability-driven shareholders at general meetings. Mainly, the remote voting implementation increased the percentage of women on board by approximately 3 p.p., representing nearly 50% of the pre-adoption ratio of female directors. Estimates from a Regression Descontinuity Design corroborate those findings. Moreover, I find that the remote voting adoption increased in around 10 foreign fund votes in support of female directors, where the pre-adoption average for the treated companies was 1.75 foreign

votes, representing a 6-time increase. There was also a shift of preference of foreign investors from male directors to female directors.

This research has several policy and regulatory implications. First, minority shareholder empowerment strategies, such as remote voting, can lead to significant improvements in corporate governance practices. Second, fostering the participation of international investors, especially the ones with universal ownership, can influence positively the invested market as they reduce the gap of the quality of governance practices between developed and emerging economies. Third, government-mandated female quota in boardrooms can be associated with a deterioration in firm value due to short-term undersupply of qualified women candidates (Hwang et al., 2021). I suggest that using wider governance policies, targeting structural problems, although possibly slower, might be a better option because it allows for the organic adjustment of the market for female directors, thus potentially avoiding other quota-related side effects, such as overboarded female directors.

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Figure 1 – Evolution of monitoring bodies

This figure reports the time evolution of the number of companies that installed the supervisory council and audit committee in the Brazilian market. The black vertical line is a reference for before and after all companies had adopted the remote voting mechanism, that is, from 2018 on.
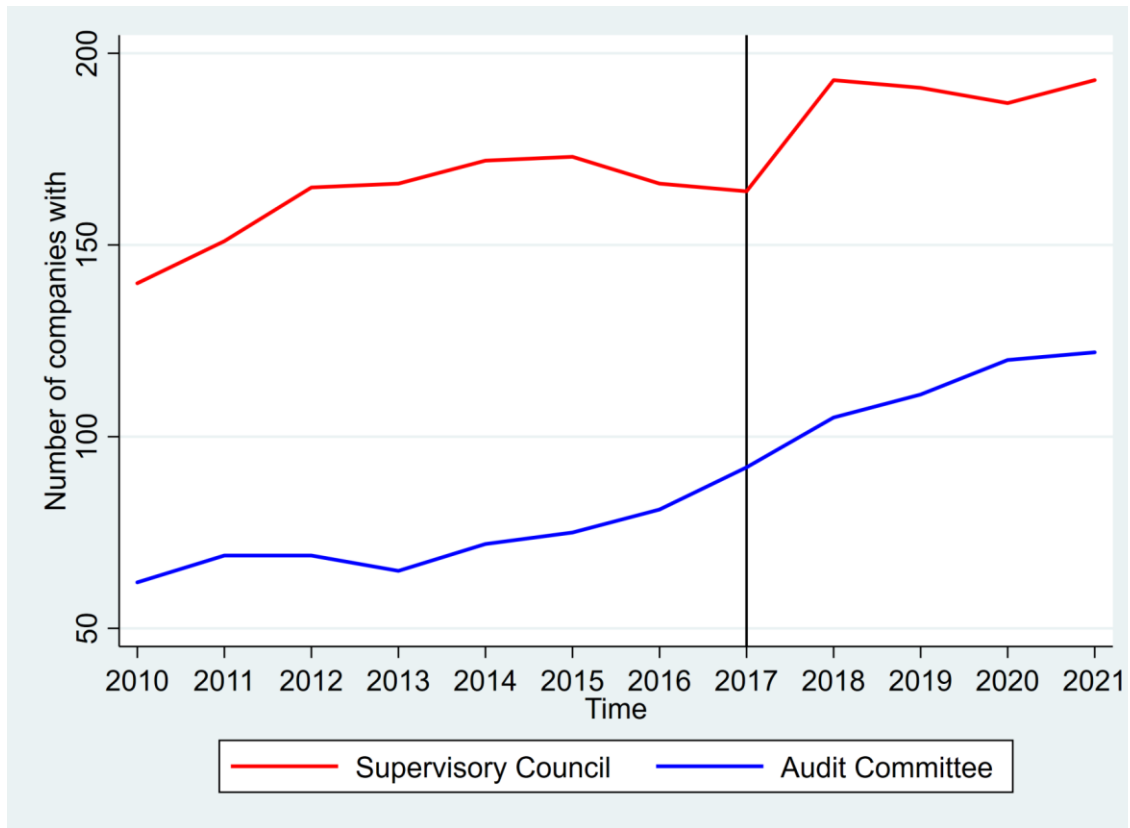
Figure 2 – Number of invested companies by the Big Four

This figure reports the number of Brazilian companies that the Big Four shareholders (BlackRock, Vanguard, State Street and Norges) invested throughout the years for treatment and control groups. It is worth noting that if a company is invested by more than one of these 4 investors in a given year, it counts only as 1 in this graphic. The black vertical lines are a reference for the before and after the 2-step adoption, that is, from 2017 on for the treatment group and from 2018 on for the control group.
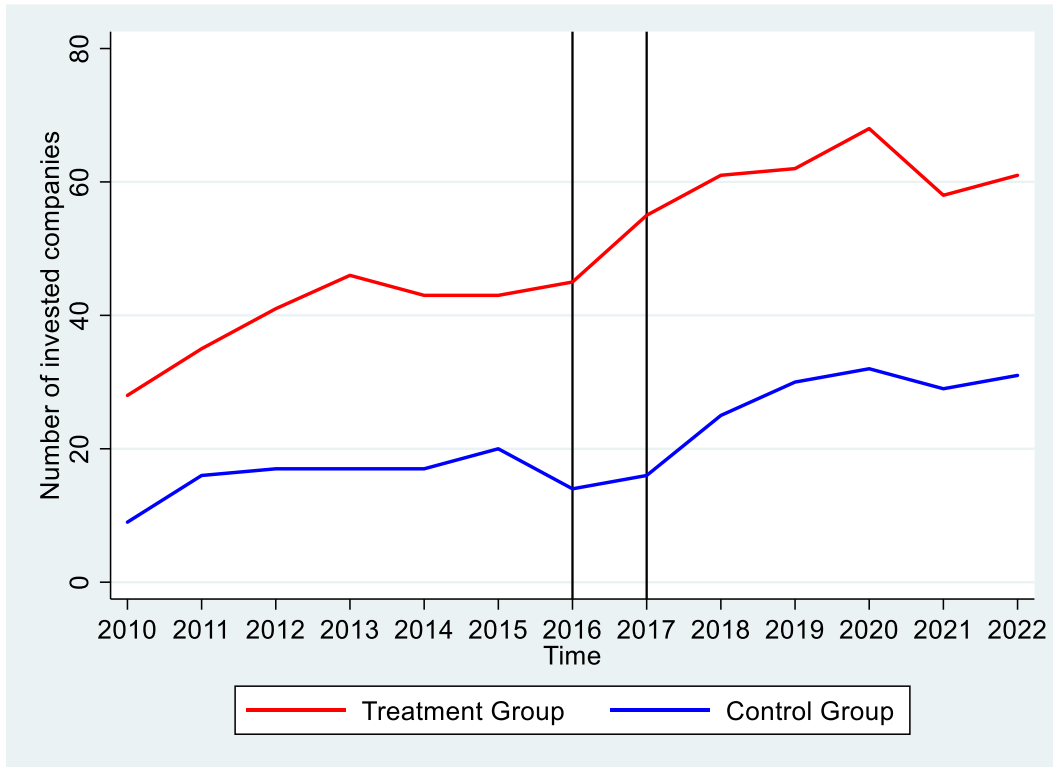
Figure 3 – Number of investor-company interactions

This figure reports the number of investments in Brazilian companies that the Big Four shareholders (BlackRock, Vanguard, State Street and Norges) realized throughout the years for the whole sample. It is worth noting that, differently from the prior figure, if a company is invested by more than one of these 4 investors in a given year, it counts all investments in the same company in this graphic. The black vertical line is a reference for before and after the beginning of the remote voting adoption.
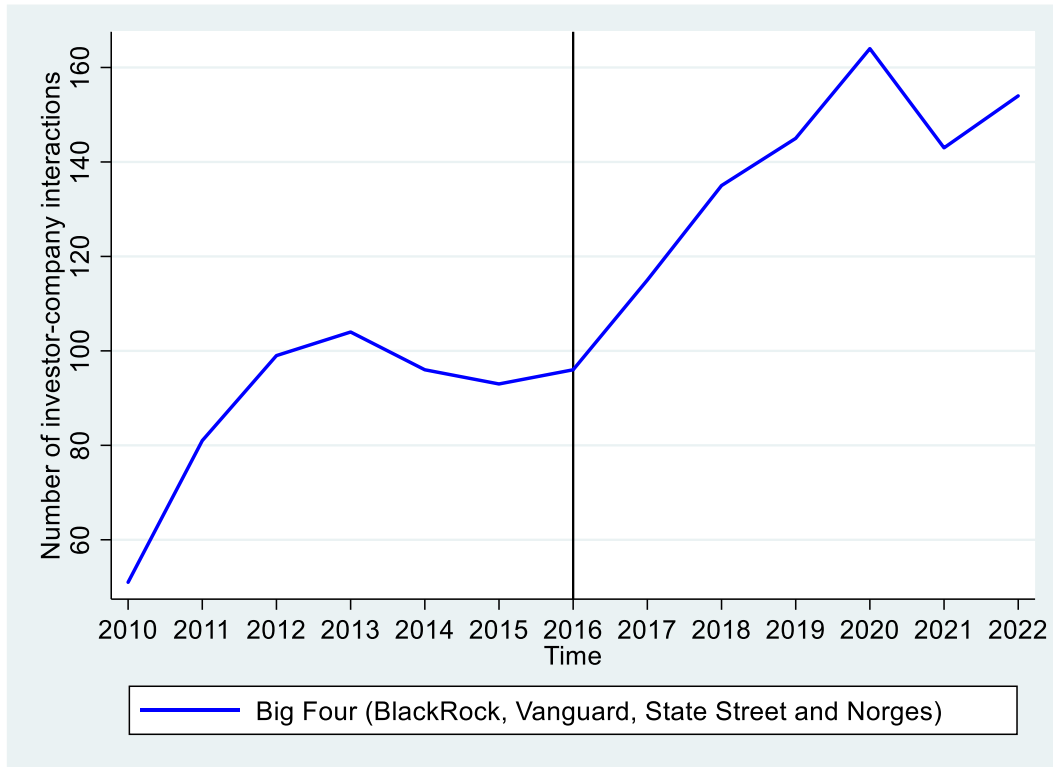
Figure 4 – Evolution of women on board

This figure reports the time evolution of the percentage of women on board, calculated by the number of female board members divided by the total number of board members, for control and treatment groups. The black vertical lines are a reference for the before and after the 2-step adoption, that is, from 2017 on for the treatment group and from 2018 on for the control group.
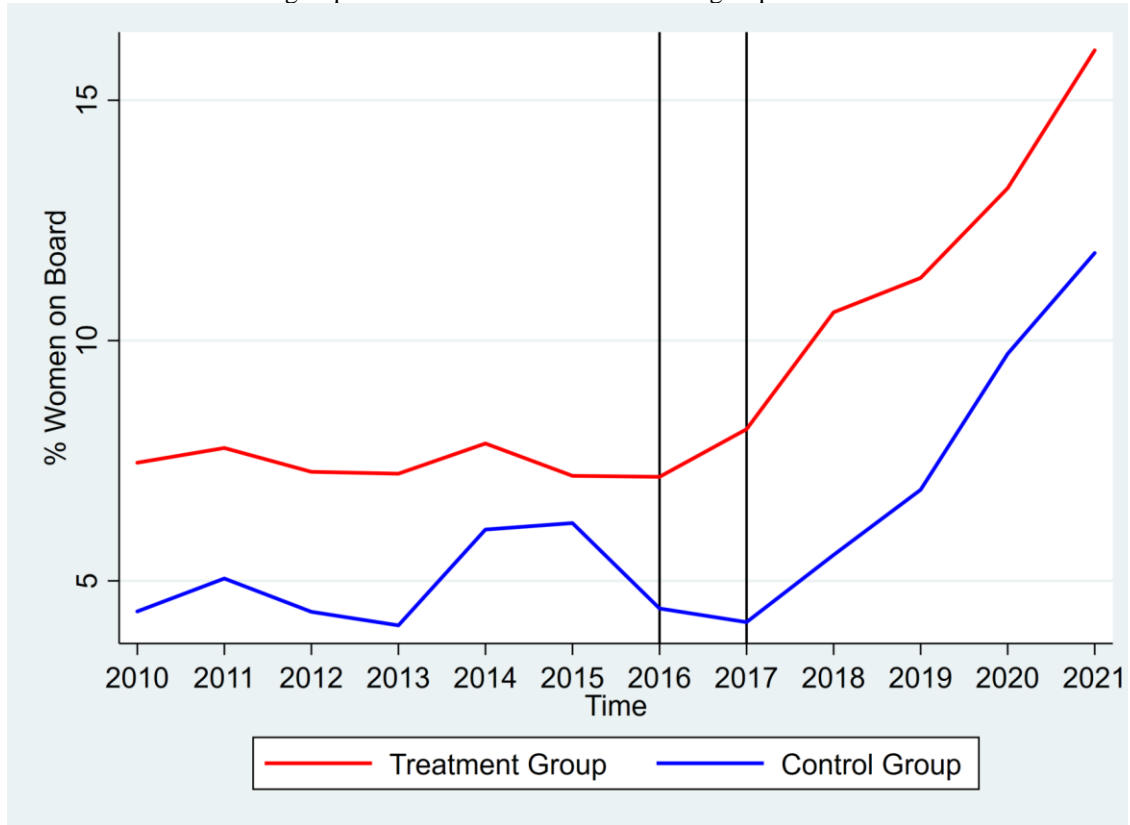
Figure 5 – Number of Characters in AGM minutes

This figure reports the time evolution of the average number of characters contained in AGM minutes for the treatment and control groups. The number of characters are measured as the amount of letters, numbers and other items, except spaces of the document.
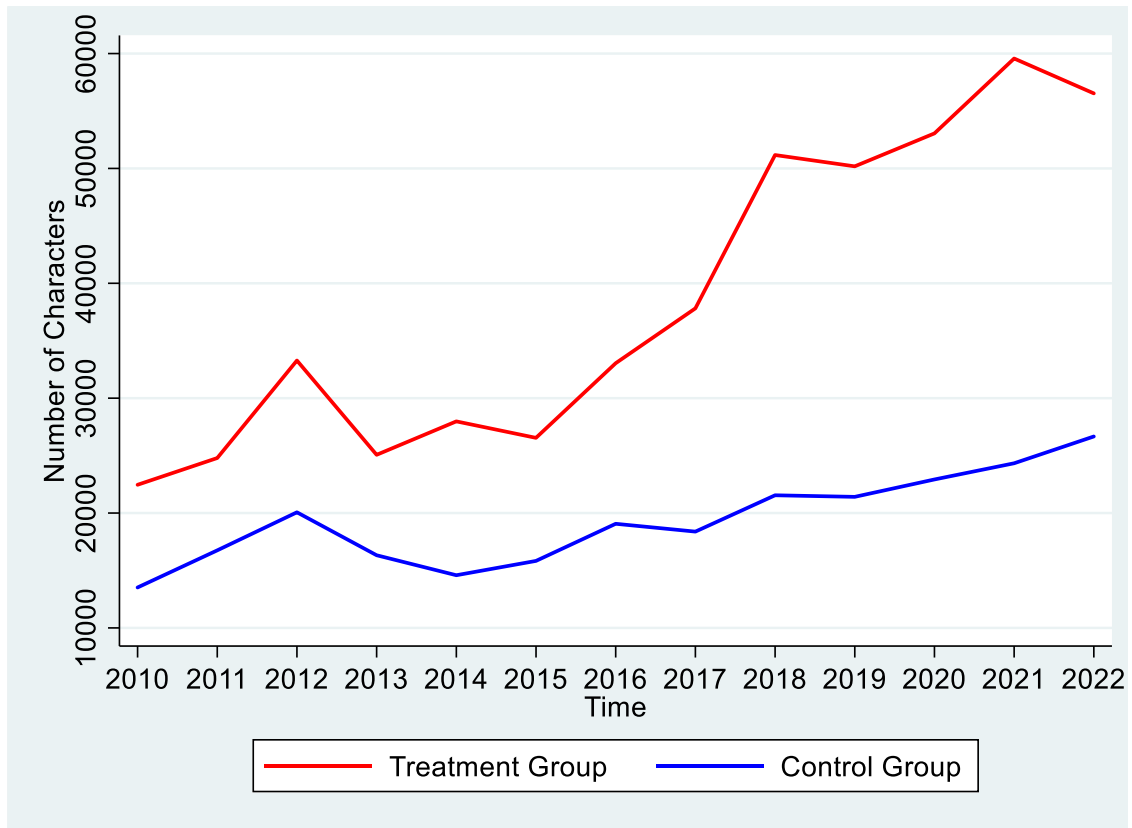
Figure 6 – Number of mentions of Foreign Investors

This figure reports the average number of mentions of foreign investors presented in companies AGM minutes. Here, the number of mentions regards the average number of words in the AGMs minute per firm-year. The words used for foreign investors are BlackRock, Vanguard, State Street, Norges, Fidelity, Voya, Lazard, Rowe and Wisdomtree. There are other investors cited in the minutes, but they are numerically residual. The data in this graph comprises the full sample.
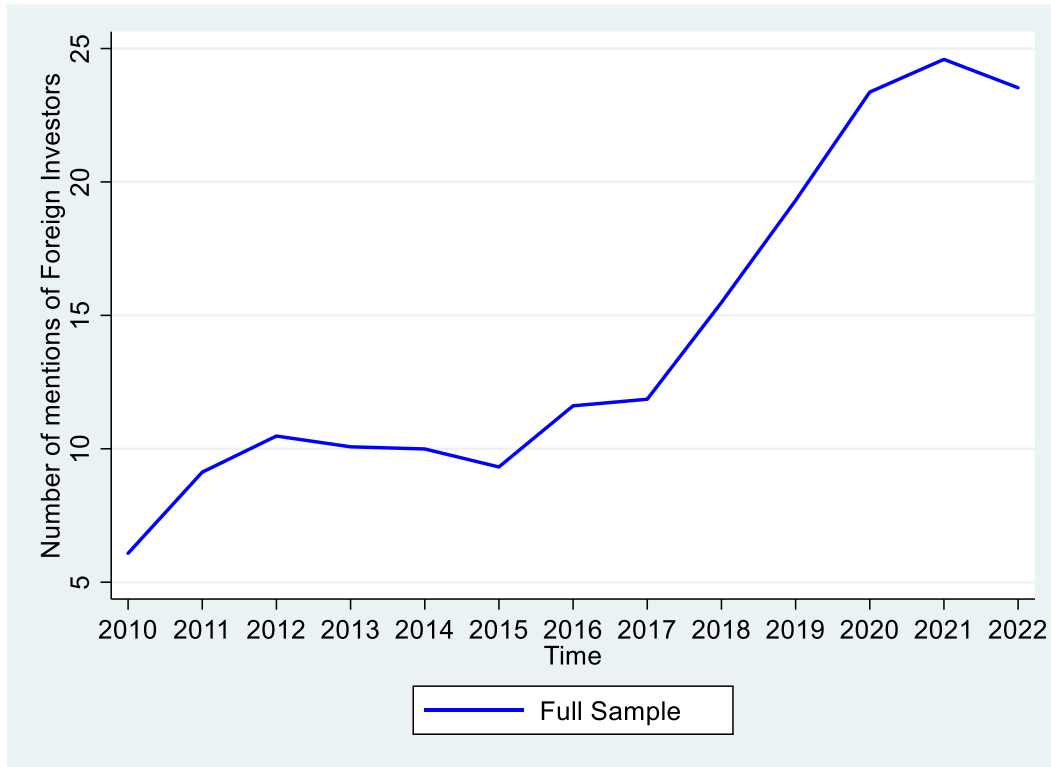
Figure 7 – Number of mentions of Pension Funds

This figure reports the average number of mentions of pension funds presented in companies AGM minutes. Here, the number of mentions regards the average number of words in the AGMs minute per firm-year. The words used for pension funds are the variations of the expression 'pension funds' in English or Portuguese. The data in this graph comprises the full sample.
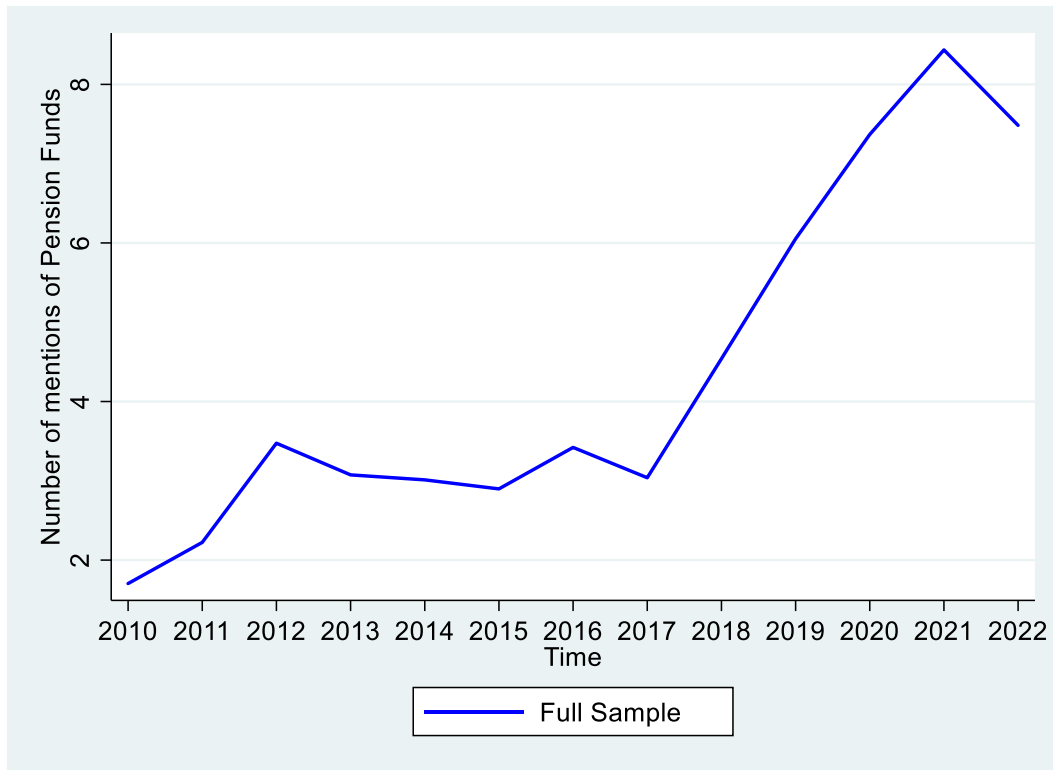
Figure 8 – Number of mentions of Responsibility

This figure reports the average number of mentions of responsibility-related words presented in companies AGM minutes. Here, the number of mentions regards the average number of words in the AGMs minute per firm-year. The words used for responsibility are ESG, green, responsibility and sustainable. The data in this graph comprises the full sample.
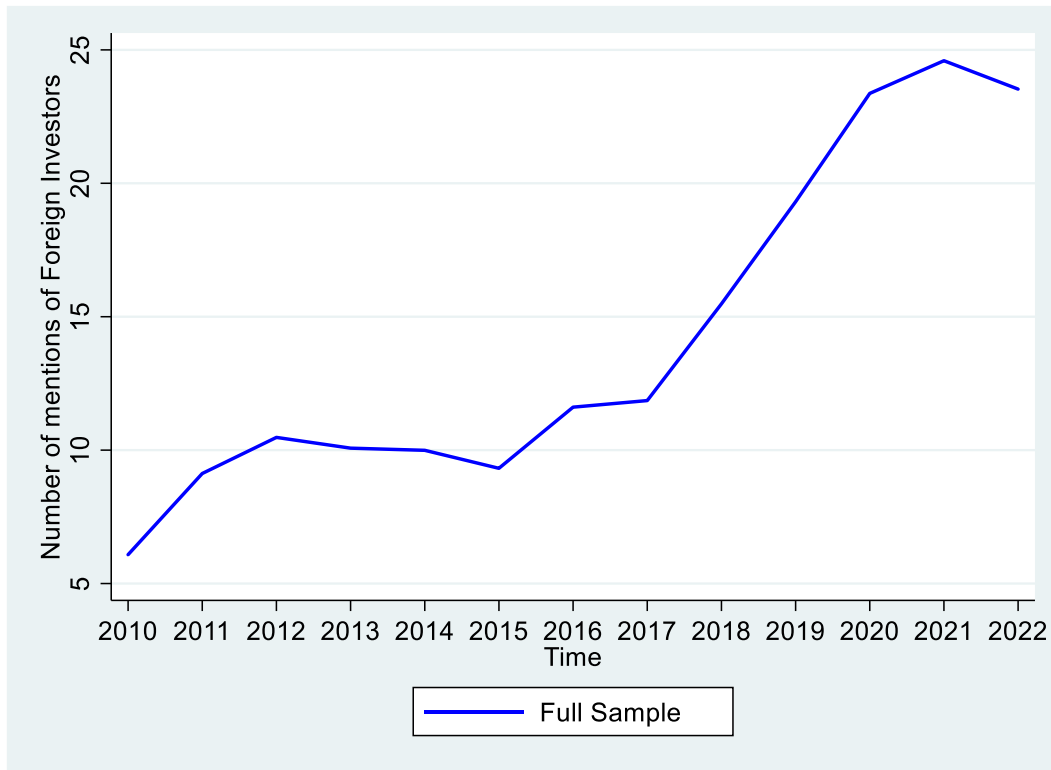
Table 1 - Sample

This table reports the description of the composition regarding the final sample used in this research. Companies (27) with voluntary adoption, late adoption and interrupted use were excluded. Finally, ranking all companies by liquidity (Trading Index), all treatment companies rank first, except for 1 company that was excluded.

Exclusions	2017 adopters	2018 adopters	Total
Full sample	94	240	**334**
Voluntary adoption	3	7	**10**
Interrupted use	2	6	**8**
Late adoption	0	9	**9**
Unmatching TI score	1	0	**1**
Remaining sample	88	218	**306**

Table 2 - Data Source (summarized)

This table reports the source of each relevant variable used in this work as well as the method it was collected.

Variables	Source
Remote voting usage	B3 administrative database
Voting turnout	Hand-collected (AGMs minutes)
Women on board (company level)	Comdinheiro
Women on board (director level)	Comdinheiro, hand-collected (CVM ref. form)
Women on board (Argentina, Chile, Colombia, Peru and Mexico)	BOARDEX
Shareholder voting	ISS
Governance Segments, Supervisory Council and Audit Committee	Comdinheiro
Shareholder ownership (>5%)	Comdinheiro, hand-collected (CVM ref. form)
Shareholder ownership (all)	Thomson Reuters-Refinitiv, hand-collected
Control Variables, Trading Index	Comdinheiro

Table 3 – 88/88 Approach

This table reports the division of the sample in three groups as they are ranked by liquidity (Trading Index). The treatment group regards the first 88 companies with the highest TI. The control group is divided in two groups, the first includes the 89th until 176th company with the highest TI, and the second includes the remaining control companies. The rationale is that both treatment and the first control sub-group have a similar distribution regarding governance structure, having for instance a comparable proportion of companies listed in the highest listing segment, the most demanding in terms of corporate governance rules.

Governance Listing Segment	Treatment Group (1st 88)	Control Group (2nd 88)	Others (130)
Lowest level (Corporate Law)	6,80%	25,00%	93,00%
Mid-levels	31,80%	10,20%	7,00%
Highest level (Novo Mercado)	61,40%	64,80%	0,00%
Total	100,00%	100,00%	100,00%

Table 4 – DiD estimates for voting turnout

The table reports OLS regression estimates of the AGMs' turnout (%) (number of voting shares that voted/total of voting shares) using a DiD identification strategy. $RemoteVote_{i,t}$ is the variable that represents the effect of remote voting on the AGM quorum (voting turnout), obtained as the interaction of $Time_t$ (post-adoption dummy variable) and $Indices_i$ (dummy indicating participation in a stock exchange index whose components mandatorily adopted the remote voting mechanism). In a Firm and Year Fixed Effects setting, the last two dummies are dropped. Full sample comprises 306 companies. 88/88 Approach regards the use of a sub-control group of 88 companies that both treatment and control groups share similar corporate governance structures. NM companies as sample refers to only using firms listed in the highest corporate governance segment in the Brazilian market, Novo Mercado, summing up to 111 companies, being 54 from the treatment group. Using RV users as treatment group, the 16 companies that had no investors using the remote voting mechanism are excluded, therefore, the treatment group totalizes 72 companies. Firm and Year Fixed Effects are used in all equations. Control variables account for firm size, liquidity, profitability, and leverage. To argue the allowance of heterogeneous trends, it was added the following control variables: $LinearControl_t$, where year 1 = 1, year 2 = 2, …, year N = N, and the interaction between $LinearControl_t$ and $Indices_i$, leading to the main control variable $HeterogeneousTrends_{i,t}$. 3-year pre-treatment period refers to 2014 to 2016 and 6-year pre-treatment period refers to 2011 to 2016. This strategy was implemented due to the possibility of low-quality data during the first years as well as missing values given that most corporate governance data in Brazil started to be disclosed in 2010, therefore, there could be a learning curve by the companies. As a matter of fact, for the variable quorum, the period 2011 to 2013 had missing values in approximately 45% of the observations, while the period 2014-2016 had 27%. For example, some companies, specially before 2016, disclosed that: "shareholder representing more than 2/3 of the voting capital", "more than 50%", "the legal minimum quorum", etc. Therefore, I could not assume what quorum it would be. In one type of writing, I could collect: "shareholder representing 100% of the voting capital", "unanimity", "totality of voting capital". In all equations it is used a 1-year pos-treatment period (2017). Average voting turnout pre-adoption regards the average quorum of the referred pre-treatment period for the treatment group. Standard errors (in parentheses) are clustered at the firm level; p-values are described as: *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

	(1)	(2)	(3)	(4)	(5)
RemoteVote	7.33***	5.76**	8.60***	6.89**	6.31**
(Robust standard error)	(2.29)	(2.57)	(2.39)	(2.66)	(3.01)
Full Sample	Yes	Yes	Yes	Yes	No
88/88 Approach	No	No	No	No	Yes
NM companies as sample	No	No	No	No	No
RV users as treatment group	No	No	Yes	Yes	No
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes
Allowing Heterogeneous Trends	No	Yes	No	Yes	No
3-year pre-treatment period	No	No	No	No	No
6-year pre-treatment period	Yes	Yes	Yes	Yes	Yes
Number of Observations	957	957	911	911	615
Average voting turnout pre-adoption	70.69	70.69	69.43	69.43	68.10

Table 4 – DiD estimates for voting turnout (continued)

The table reports OLS regression estimates of the AGMs' turnout (%) (number of voting shares that voted/total of voting shares) using a DiD identification strategy. $RemoteVote_{i,t}$ is the variable that represents the effect of remote voting on the AGM quorum (voting turnout), obtained as the interaction of $Time_t$ (post-adoption dummy variable) and $Indices_i$ (dummy indicating participation in a stock exchange index whose components mandatorily adopted the remote voting mechanism). In a Firm and Year Fixed Effects setting, the last two dummies are dropped. Full sample comprises 306 companies. 88/88 Approach regards the use of a sub-control group of 88 companies that both treatment and control groups share similar corporate governance structures. NM companies as sample refers to only using firms listed in the highest corporate governance segment in the Brazilian market, Novo Mercado, summing up to 111 companies, being 54 from the treatment group. Using RV users as treatment group, the 16 companies that had no investors using the remote voting mechanism are excluded, therefore, the treatment group totalizes 72 companies. Firm and Year Fixed Effects are used in all equations. Control variables account for firm size, liquidity, profitability, and leverage. To argue the allowance of heterogeneous trends, it was added the following control variables: $LinearControl_t$, where year 1 = 1, year 2 = 2, …, year N = N, and the interaction between $LinearControl_t$ and $Indices_i$, leading to the main control variable $HeterogeneousTrends_{i,t}$. 3-year pre-treatment period refers to 2014 to 2016 and 6-year pre-treatment period refers to 2011 to 2016. This strategy was implemented due to the possibility of low-quality data during the first years as well as missing values given that most corporate governance data in Brazil started to be disclosed in 2010, therefore, there could be a learning curve by the companies. As a matter of fact, for the variable quorum, the period 2011 to 2013 had missing values in approximately 45% of the observations, while the period 2014-2016 had 27%. For example, some companies, specially before 2016, disclosed that: "shareholder representing more than 2/3 of the voting capital", "more than 50%", "the legal minimum quorum", etc. Therefore, I could not assume what quorum it would be. In one type of writing, I could collect: "shareholder representing 100% of the voting capital", "unanimity", "totality of voting capital". In all equations it is used a 1-year pos-treatment period (2017). Average voting turnout pre-adoption regards the average quorum of the referred pre-treatment period for the treatment group. Standard errors (in parentheses) are clustered at the firm level; p-values are described as: *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

	(6)	(7)	(8)	(9)	(10)
RemoteVote	7.96**	6.13**	8.13**	9.61***	6.66*
(Robust standard error)	(3.29)	(3.08)	(3.16)	(3.18)	(3.53)
Full Sample	No	No	No	No	No
88/88 Approach	Yes	Yes	No	No	No
NM companies as sample	No	No	Yes	Yes	Yes
RV users as treatment group	Yes	Yes	No	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes
Allowing Heterogeneous Trends	No	Yes	No	No	Yes
3-year pre-treatment period	No	No	No	No	No
6-year pre-treatment period	Yes	Yes	Yes	Yes	Yes
Number of Observations	584	584	439	413	413
Average voting turnout pre-adoption	67.61	67.61	66.39	66.24	66.24

Table 4 – DiD estimates for voting turnout (continued)

The table reports OLS regression estimates of the AGMs' turnout (%) (number of voting shares that voted/total of voting shares) using a DiD identification strategy. RemoteVote$_{i,t}$ is the variable that represents the effect of remote voting on the AGM quorum (voting turnout), obtained as the interaction of Time$_t$ (post-adoption dummy variable) and Indices$_i$ (dummy indicating participation in a stock exchange index whose components mandatorily adopted the remote voting mechanism). In a Firm and Year Fixed Effects setting, the last two dummies are dropped. Full sample comprises 306 companies. 88/88 Approach regards the use of a sub-control group of 88 companies that both treatment and control groups share similar corporate governance structures. NM companies as sample refers to only using firms listed in the highest corporate governance segment in the Brazilian market, Novo Mercado, summing up to 111 companies, being 54 from the treatment group. Using RV users as treatment group, the 16 companies that had no investors using the remote voting mechanism are excluded, therefore, the treatment group totalizes 72 companies. Firm and Year Fixed Effects are used in all equations. Control variables account for firm size, liquidity, profitability, and leverage. To argue the allowance of heterogeneous trends, it was added the following control variables: LinearControl$_t$, where year $1 = 1$, year $2 = 2$, …, year $N = N$, and the interaction between LinearControl$_t$ and Indices$_i$, leading to the main control variable HeterogeneousTrends$_{i,t}$. 3-year pre-treatment period refers to 2014 to 2016 and 6-year pre-treatment period refers to 2011 to 2016. This strategy was implemented due to the possibility of low-quality data during the first years as well as missing values given that most corporate governance data in Brazil started to be disclosed in 2010, therefore, there could be a learning curve by the companies. As a matter of fact, for the variable quorum, the period 2011 to 2013 had missing values in approximately 45% of the observations, while the period 2014-2016 had 27%. For example, some companies, specially before 2016, disclosed that: "shareholder representing more than 2/3 of the voting capital", "more than 50%", "the legal minimum quorum", etc. Therefore, I could not assume what quorum it would be. In one type of writing, I could collect: "shareholder representing 100% of the voting capital", "unanimity", "totality of voting capital". In all equations it is used a 1-year pos-treatment period (2017). Average voting turnout pre-adoption regards the average quorum of the referred pre-treatment period for the treatment group. Standard errors (in parentheses) are clustered at the firm level; p-values are described as: *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

	(11)	(12)	(13)	(14)
RemoteVote	8.08***	9.19***	9.20***	10.55***
(Robust standard error)	(1.94)	(2.01)	(2.75)	(2.84)
Full Sample	No	No	No	No
88/88 Approach	Yes	Yes	No	No
NM companies as sample	No	No	Yes	Yes
RV users as treatment group	No	Yes	No	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes
Allowing Heterogeneous Trends	No	No	No	No
3-year pre-treatment period	Yes	Yes	Yes	Yes
6-year pre-treatment period	No	No	No	No
Number of Observations	513	473	328	299
Average voting turnout pre-adoption	70.98	69.43	69.05	66.92

Table 5 - RV investor usage

This table reports the remote voting usage numbers, including the number of remote voting ballots received each year and the number of investors that sent the voting form. RV ballots per Investor accounts for the number of RV ballots divided by the number of investors.

Year	Number of RV ballots	Number of Investors	RV ballots per Investor
2016	528	419	1.3
2017	11,694	2,481	4.7
2018	53,414	2,928	18.2
2019	60,554	3,336	18.2
2020	76,750	3,732	20.6

Table 6 - RV investor usage by country

This table reports the remote voting investor usage by country, describing the total percentage of foreign shareholders that used the mechanism and the top-10 remote voting country users, accounting for around 95% of the total usage every year.

Country	2017	2018	2019	2020
All foreigners	**98.7%**	**98.9%**	**98.6%**	**98.2%**
United States	63%	60%	59%	56%
Ireland	8%	7%	7%	7%
Great Britain	6%	7%	7%	7%
Canada	6%	7%	7%	6%
Luxembourg	4%	4%	4%	5%
Australia	3%	4%	4%	4%
Japan	3%	2%	2%	3%
Cayman Islands	1%	1%	2%	2%
Brazil	1%	1%	1%	2%
Netherlands	1%	1%	1%	2%

Table 7 – DiD estimates for women on board

The table reports OLS regression estimates of the percentage of women on board (number of female directors/board size) using a DiD identification strategy. $RemoteVote_{i,t}$ is the variable that represents the effect of remote voting on the percentage of women on board, obtained as the interaction of $Time_t$ (post-adoption dummy variable) and $Indices_i$ (dummy indicating participation in a stock exchange index whose components mandatorily adopted the remote voting mechanism). In a Firm and Year Fixed Effects setting, the last two dummies are dropped. Full sample comprises 306 companies. 88/88 Approach regards the use of a sub-control group of 88 companies that both treatment and control groups share similar corporate governance structure. The control group composed by 130 Latin American companies includes firms from Argentina, Colombia, Chile, Peru and Mexico. Using RV users as treatment group, the 16 companies that had no investors using the remote voting mechanism are excluded, therefore, the treatment group totalizes 72 companies. Firm and Year Fixed Effects are used in all equations. Control variables account for firm size, liquidity, profitability, and leverage. To argue the allowance of heterogeneous trends, it was added the following control variables: $LinearControl_t$, where year 1 = 1, year 2 = 2, …, year N = N, and the interaction between $LinearControl_t$ and $Indices_i$, leading to the main control variable $HeterogeneousTrends_{i,t}$. 3-year pre-treatment period refers to 2014 to 2016 and 6-year pre-treatment period refers to 2011 to 2016. This strategy was implemented due to the possibility of low-quality data during the first years as well as missing values given that most corporate governance data in Brazil started to be disclosed in 2010, therefore, there could be a learning curve by the companies. 5-year post-treatment period refers to the possibility of using a bigger pos-treatment window when suing Latin American companies as control, what could not happen with the Brazilian companies once the control group adopts the same mechanism the next year (2018). In all equations using only Brazilian companies, it is used a 1-year pos-treatment period (2017). Standard errors (in parentheses) are clustered at the firm level; p-values are described as: *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

	(1)	(2)	(3)	(4)	(5)
RemoteVote	2.53**	3.12**	3.16**	3.66***	2.89**
(Robust standard error)	(1.20)	(1.29)	(1.22)	(1.33)	(1.18)
Full Sample	Yes	Yes	Yes	Yes	No
88/88 Approach	No	No	No	No	Yes
Latin American as control group	No	No	No	No	No
RV users as treatment group	No	Yes	No	Yes	No
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes
Allowing Heterogeneous Trends	Yes	Yes	Yes	Yes	No
3-year pre-treatment period	No	No	Yes	Yes	Yes
6-year pre-treatment period	Yes	Yes	No	No	No
5-year post-treatment period	No	No	No	No	No
Number of Observations	1,939	1,829	1,127	1,065	668

Table 7 – DiD estimates for women on board (continued)

The table reports OLS regression estimates of the percentage of women on board (number of female directors/board size) using a DiD identification strategy. $RemoteVote_{i,t}$ is the variable that represents the effect of remote voting on the percentage of women on board, obtained as the interaction of $Time_t$ (post-adoption dummy variable) and $Indices_i$ (dummy indicating participation in a stock exchange index whose components mandatorily adopted the remote voting mechanism). In a Firm and Year Fixed Effects setting, the last two dummies are dropped. Full sample comprises 306 companies. 88/88 Approach regards the use of a sub-control group of 88 companies that both treatment and control groups share similar corporate governance structure. The control group composed by 130 Latin American companies includes firms from Argentina, Colombia, Chile, Peru and Mexico. Using RV users as treatment group, the 16 companies that had no investors using the remote voting mechanism are excluded, therefore, the treatment group totalizes 72 companies. Firm and Year Fixed Effects are used in all equations. Control variables account for firm size, liquidity, profitability, and leverage. To argue the allowance of heterogeneous trends, it was added the following control variables: $LinearControl_t$, where year 1 = 1, year 2 = 2, …, year N = N, and the interaction between $LinearControl_t$ and $Indices_i$, leading to the main control variable $HeterogeneousTrends_{i,t}$. 3-year pre-treatment period refers to 2014 to 2016 and 6-year pre-treatment period refers to 2011 to 2016. This strategy was implemented due to the possibility of low-quality data during the first years as well as missing values given that most corporate governance data in Brazil started to be disclosed in 2010, therefore, there could be a learning curve by the companies. 5-year post-treatment period refers to the possibility of using a bigger pos-treatment window when suing Latin American companies as control, what could not happen with the Brazilian companies once the control group adopts the same mechanism the next year (2018). In all equations using only Brazilian companies, it is used a 1-year pos-treatment period (2017). Standard errors (in parentheses) are clustered at the firm level; p-values are described as: *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

	(6)	(7)	(8)	(9)	(10)
RemoteVote	3.06**	2.73**	3.25**	3.46**	4.06***
(Robust standard error)	(1.27)	(1.29)	(1.40)	(1.34)	(1.42)
Full Sample	No	No	No	No	No
88/88 Approach	Yes	Yes	Yes	Yes	Yes
Latin American as control group	No	No	No	No	No
RV users as treatment group	Yes	No	Yes	No	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes
Allowing Heterogeneous Trends	No	Yes	Yes	Yes	Yes
3-year pre-treatment period	Yes	Yes	Yes	No	No
6-year pre-treatment period	No	No	No	Yes	Yes
5-year post-treatment period	No	No	No	No	No
Number of Observations	606	668	606	1,158	1,048

Table 7 – DiD estimates for women on board (continued)

The table reports OLS regression estimates of the percentage of women on board (number of female directors/board size) using a DiD identification strategy. $RemoteVote_{i,t}$ is the variable that represents the effect of remote voting on the percentage of women on board, obtained as the interaction of $Time_t$ (post-adoption dummy variable) and $Indices_i$ (dummy indicating participation in a stock exchange index whose components mandatorily adopted the remote voting mechanism). In a Firm and Year Fixed Effects setting, the last two dummies are dropped. Full sample comprises 306 companies. 88/88 Approach regards the use of a sub-control group of 88 companies that both treatment and control groups share similar corporate governance structure. The control group composed by 130 Latin American companies includes firms from Argentina, Colombia, Chile, Peru and Mexico. Using RV users as treatment group, the 16 companies that had no investors using the remote voting mechanism are excluded, therefore, the treatment group totalizes 72 companies. Firm and Year Fixed Effects are used in all equations. Control variables account for firm size, liquidity, profitability, and leverage. To argue the allowance of heterogeneous trends, it was added the following control variables: $LinearControl_t$, where year 1 = 1, year 2 = 2, ..., year N = N, and the interaction between $LinearControl_t$ and $Indices_i$, leading to the main control variable $HeterogeneousTrends_{i,t}$. 3-year pre-treatment period refers to 2014 to 2016 and 6-year pre-treatment period refers to 2011 to 2016. This strategy was implemented due to the possibility of low-quality data during the first years as well as missing values given that most corporate governance data in Brazil started to be disclosed in 2010, therefore, there could be a learning curve by the companies. 5-year post-treatment period refers to the possibility of using a bigger pos-treatment window when suing Latin American companies as control, what could not happen with the Brazilian companies once the control group adopts the same mechanism the next year (2018). In all equations using only Brazilian companies, it is used a 1-year pos-treatment period (2017). Standard errors (in parentheses) are clustered at the firm level; p-values are described as: *** p<0.01, ** p<0.05, * p<0.1.

	(11)	(12)	(13)	(14)
RemoteVote	2.35**	2.96**	2.97**	3.69***
(Robust standard error)	(1.05)	(1.15)	(1.17)	(1.25)
Full Sample	No	No	No	No
88/88 Approach	No	No	No	No
Latin American as control group	Yes	Yes	Yes	Yes
RV users as treatment group	No	Yes	No	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Control Variables	No	No	No	No
Allowing Heterogeneous Trends	Yes	Yes	Yes	Yes
3-year pre-treatment period	No	No	No	No
6-year pre-treatment period	Yes	Yes	Yes	Yes
5-year post-treatment period	No	No	Yes	Yes
Number of Observations	1,404	1,294	2,031	1,867

Table 8 – DiD estimates for number of supporting foreign votes to directors

The table reports OLS regression estimates of the number of foreign investor votes using a DiD identification strategy. RemoteVote$_{i,t}$ is the variable that represents the effect of remote voting on the number of foreign casted votes, obtained as the interaction of Time$_t$ (post-adoption dummy variable) and Indices$_i$ (dummy indicating participation in a stock exchange index whose components mandatorily adopted the remote voting mechanism). In a Firm and Year Fixed Effects setting, the last two dummies are dropped. This sample comprises 209 companies. Totalvotes regards the total flow of board-related votes for all directors. Control variables account for firm size, liquidity, profitability, and leverage. In all equations it is used a 1-year post-treatment period (2017) and a 6-year pre-treatment period (2011 to 2016). Standard errors (in parentheses) are clustered at the firm level; p-values are described as: *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Variables	(1) Female Directors	(2) Male Directors
RemoteVote	10.37***	-5.673
	(3.853)	(4.743)
Totalvotes	0.0496**	0.829***
	(0.0242)	(0.0297)
Constant	-0.104	0.320
	(0.545)	(0.674)
Observations	1,463	1,463
R-squared	0.259	0.979
Number of firms	209	209
Control Variables	Yes	Yes
Firm FE	Yes	Yes
Year FE	Yes	Yes

Appendix A - Regression Discontinuity Design

I use a Regression Discontinuity Design model to provide another approach for estimating the effect of the remote voting implementation on the percentage of women on boards. The data of female directors is for the first year of adoption (2017). The period that I utilized to calculate the Trading Index was the year of 2014, because it was this calculation that defined the Trading Index that had to be used to find the IBRX-100 index composition for the first 4-month period of 2015 – when the remote voting regulation was published and became binding for those companies to start the adoption in 2017.

Table 8 - RDD estimates for women on board

The Regression Discontinuity Design estimation is calculated by the rdrobust package. BW type refers to the specification of the bandwidth selection procedure to be used. Kernel regards the function used to construct the local-polynomial estimator. The effective number of observations is calculated according to the chosen setting. The running variable is the Trading Index and the cut-off is 11.93%. Equation (I) is the default setting. From the setting options combinations, I provide the 5 most fitting ones.

Equations	(I)	(II)	(III)	(IV)	(V)	(VI)
Coefficient	**17.45****	**10.78*****	**11.00*****	**11.12*****	**9.97*****	**9.91*****
(Robust standard error)	(7.61)	(3.46)	(3.59)	(3.01)	(3.14)	(2.79)
BW type	mserd	msetwo	certwo	msetwo	certwo	msesum
Kernel	triangular	triangular	triangular	epanechnikov	epanechnikov	uniform
Eff. number of obs.	100	150	96	117	93	97

Even though the effective number of observations is relatively low, I find statistically significant results that corroborate the Difference in Differences estimates. As a parameter of comparison, a RDD linear estimation would provide an effect of around 4 p.p, within the range of the DiD findings. This approach, on the other hand, uses a more sophisticated set of tools, including procedures to optimize the bandwidth and function to provide the local-polynomial estimator. Equation (I) yields the estimation using the default setting, and the other equations include the most fitting setting combinations. Although the results slightly differ in terms of magnitude, they confirm the previous outcomes in terms of direction and statistical significance.