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**WELL-TARGETED REGULATION: REVISITING THE ROLE OF CEO
NON-DUALITY ON CORPORATE PERFORMANCE**

**Recife
2021**

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Dissertação apresentada ao Programa de Pós Graduação em Ciências Contábeis da Universidade Federal de Pernambuco, Centro Acadêmico CCSA, como requisito para a obtenção do título de Mestre em Ciências Contábeis. Área de concentração: Informação Contábil.

Orientador: Prof. Dr. Giuseppe Trevisan Cruz.

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ABSTRACT

We investigate the effect of CEO non-duality on performance of publicly traded companies. We exploit a unique quasi-experiment promoted by a regulatory change in the Brazilian Stock Exchange that abolished the accumulation of Chief Executive Officer (CEO) and Chair of Board (COB) titles in companies in which pluralism was previously possible. Using a differences-in-differences research design, we find a long-lasting positive effect on firms value and weaker evidence on profitability. Our evidences dissent from prior studies that show non-duality firms underperforming their counterparts. Neither immediate market reaction nor changes in investing and financing choices explain our results. All profiles of CEO permanency are found to be beneficial, however, demotion separations experience stronger impacts. Our findings suggest that well-targeted regulations aiming at separating CEO and COB roles may enhance firm performance through improvements in decision-making processes regardless of the form of separation, thus offsetting agency costs related to the new structure.

Keywords: Corporate governance practices. CEO non-duality. Corporate performance.

RESUMO

Nesta pesquisa, investiga-se os efeitos de não-dualidade de CEO sobre o desempenho de companhias de capital aberto. Para tanto, explorou-se um quase-experimento singular promovido por uma mudança regulatória na Bolsa de Valores Brasileira que aboliu a acumulação de títulos de Diretor-Presidente (CEO) e Presidente do Conselho de Administração (COB) em empresas nas quais se permitia anteriormente uma estrutura de dualidade. Aplicando a estratégia de pesquisa de diferenças em diferenças, encontra-se um efeito positivo duradouro sobre o valor das empresas e evidências mais fracas sobre as medidas de lucratividade. Estes resultados divergem de estudos anteriores que mostram empresas sem dualidade com desempenho inferior às com estrutura de liderança unificada. O benefício na separação dos cargos é identificado em todas as alternativas de separação; contudo, percebe-se um efeito mais forte nos casos de troca do Presidente do Conselho. Tais achados sugerem que regulações adequadamente direcionadas que visem a separação das funções de Diretor-Presidente e Presidente do Conselho podem melhorar o desempenho da empresa por meio de melhorias nos processos de tomada de decisão, independentemente da forma de separação, compensando assim os custos da agência relacionados à nova estrutura.

Palavras-chaves: Práticas de governança corporativa. Não-dualidade de CEO. Desempenho corporativo.

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1 INTRODUCTION

In order to promote transparency in financial transactions and to improve environmental features for stakeholders, regulatory institutions design and recommend standards addressing multiple governance topics. Among these affairs, the literature has been dedicating efforts to understand the implications of accumulating Chief Executive Officer (CEO) and Chair of the Board (COB) titles¹ to firms performance and the role of external interventions in this matter. Regulations affecting the separation of these titles are rare, and when they exist, usually are non-mandatory. The main concern with non-coercive interventions is that organizations still may endogenously decide about changing to non-duality or maintaining a dual leadership structure. This raises questions about how well-targeted regulations, if implemented, would influence corporate performance. Empirical evidences are of particular interest for all market players and policy makers since it subsidizes debates regarding conflicts of interest and better management practices.

Brazil became an interesting laboratory to explore this issue after regulatory changes made by the Brazilian Stock Exchange (*Brasil, Bolsa, Balcão* – B3) in 2011. The new amendments prohibited the accumulation of the CEO and COB positions by the same individual. Companies whose previously configured the duality structure had to comply with the regulation, but commitment to the rule rolled out heterogeneously among corporations. This unique quasi-experiment provides us opportunity to study the consequences of the mandatory split in these top positions on corporations. To our best knowledge, there is a lack of evidence in this regard.

In this paper, we estimate the causal effect of CEO non-duality on corporate performance. Focusing on publicly traded companies from specific market segments, we use detailed information on firms' financial statements and stock trading data, as well as precise dates indicating when changes on the leadership structure occurred. We employ market- and accounting-based measures to identify the extent to which they are affected by the split of these titles. We segregate our analysis into these two categories in order to assess performance from a perspective of firms' economic value and of their profitability, respectively. To properly assess causal interpretation, we employ a differences-in-differences research design using the set of eventually treated firms.

Our results drastically differ from prior studies using quasi-experimental variation coming from voluntary change in CEO duality, that conclude absence or even negative effects of separating the two leadership positions. Our evidences, in contrast, strongly suggest that switching to a separate leadership structure is beneficial for corporations. We find a long-lasting positive effect on firm's value, measured by Tobin's Q and Market-to-Book; and weaker evidence of non-duality affecting profitability, measured by Return on Assets and Return on Equity. We provide several robustness tests to assert our main

¹ The corporate finance literature usually refers to this particular leadership structure as CEO duality.

findings by exploiting different econometric specifications, alternative ways of calculating standard errors, and permutation tests.

We conduct alternative approaches to better understand what drives our main findings. To exclude the possibility that investors are sensitive to the disclosure of the new leadership, we examine responses on stock-level outcomes. Our findings reveal that neither stock prices nor abnormal returns significantly change following the announcement of new configuration in leadership structure. This suggests that potential changes on firms' value in response to the new structure are not driven by immediate market reaction but from *inside* players. Next, we investigate corporate investment policy and financing behavior changes in response to non-duality structure. Results indicate no effect for investing activities, and they show that leverage and debt ratios decrease few quarters later following the shock. However, when controlling for these measures, financing activities do not seem to explain the increase in performance as well. This indicates that gains in performance do not depend on managers' risk aversion level.

Finally, we explore different forms of separation in the spirit of Krause & Semadeni (2013) to assess the unity of command perspective inherent in the combined structure. Specifically, we evaluate treatment effects separately for firms choosing a new CEO (apprentice separation) and for those switching to a new COB (demotion separation). The positive effect in performance appears in all types of CEO profile. This finding is in line with Krause & Semadeni (2013) hypothesis, in which all alternatives to adopt non-duality structure may affect corporate performance, once this structural change has a high potential to enhance the Board's monitoring capacity. Additionally, we find stronger impacts in performance for demotion separations, which also corroborates to this argument, as this type of separation is the one more likely to end up with an independent COB — and with an independent Board, as a consequence.

Our research is intrinsic related to the literature on agency theory and on stewardship theory, by extending the understanding of the impacts of CEO non-duality on corporate outcomes. The debates on the effects of a unified or a separate leadership structure are usually centered on these two contrasting theoretical frameworks. Arguments against CEO duality derive from the perspective of the agency theory, which advocates that a unified leadership structure would expand CEO's decision-making power and would likely compromise the Board's independence and its monitoring capacity (JENSEN; MECKLING, 1979; FAMA; JENSEN, 1983). On the other hand, arguments in favor of CEO duality are based on the stewardship theory, which predicts that the combination of the CEO and COB positions may turn the leadership more effective, once this structure could enable a better coordinated decision-making process and also facilitate the implementation of corporate strategies (DONALDSON; DAVIS, 1991; JENSEN; MECKLING, 1995). When confronting our results to these theoretical predictions, we find suggestive evidence in favour to arguments provided by agency theory.

Few empirical papers employed identification strategies to address endogeneity concerns related to firms' leadership structure. Iyengar & Zampelli (2009) employ an instrumental variables approach and find no effects of CEO duality on corporate performance. Using a differences-in-differences research design, Yang & Zhao (2014) and Chang, Lee & Shim (2018) exploited shocks in firms' operational environment and found that firms with non-duality structure underperformed their counterparts. Other studies explored non-coercive regulations to address this matter;² or had their analyses narrowed to investigate correlations between CEO duality and corporate outcomes, without addressing empirical strategies to deal with such endogeneity issues.³ This might partly explain the dissenting findings in the literature. We contribute to this empirical literature by presenting causal evidence using a context where endogenous decisions related to management structure is very unlikely to bias our interpretations.

We add to the corporate governance literature, by presenting evidences on channels that help explain how non-duality structure affects firms' performance and by exploiting a device that directly targets CEO duality. In particular, our study explores a coercive regulation that imposes the separation of CEO and COB positions. The distinctive setting generated by this regulatory requirement allows mitigating endogeneity issues related to Board and leadership choices, which is a major deficiency in most previous research, as it generates estimation problems when studying governance features (DALTON et al., 1998; DAHYA; TRAVLOS, 2000; RHOADES; RECHNER; SUNDARAMURTHY, 2001; ADAMS; HERMALIN; WEISBACH, 2010; DALTON; DALTON, 2011; KRAUSE; SEMADENI; CANNELLA JUNIOR, 2014). Our findings have strong implications to policy debates regarding effectiveness of corporate governance practices by providing new insights about the role of CEO non-duality on firms' performance.

The remainder of the paper is organized as follows. Section 2 summarizes the literature on CEO duality. Section 3 discusses the institutional background. Section 4 details the data sources, variables, and sample. Section 5 describes the research design. Section 6 describe the empirical findings. Section 7 concludes.

² See, for instance, Dahya, Lonie & Power (1996), Dahya & McConnell (2007), Dahya, Garcia & Bommel (2009), Dey, Engel & Liu (2011), Larcker, Ormazabal & Taylor (2011), Krause & Semadeni (2013), and Hsu et al. (2019).

³ See, for instance, Rechner & Dalton (1991), Boyd (1995), Baliga, Moyer & Rao (1996), Brickley, Coles & Jarrell (1997), Palmon & Wald (2002), Elsayed (2007), Duru, Iyengar & Zampelli (2016), and Lew, Yu & Park (2018).

2 LITERATURE REVIEW

2.1 CEO DUALITY

The discussion on CEO duality is usually centered on two contrasting theoretical frameworks: agency theory and stewardship theory. Agency theory views negatively CEO duality, highlighting that the Board of Directors should be an independent structure in order to limit managerial opportunistic actions. Based on this theory, ensuring this monitoring role of the Board is essential to protect shareholders' interests on issues that arise from the separation of ownership and control (JENSEN; MECKLING, 1979; FAMA; JENSEN, 1983; CHANG; LEE; SHIM, 2018). In general, the COB is responsible for running board meetings and overseeing the processes of hiring, firing, evaluating, and compensating the CEO. Agency theory predicts that an unique person accumulating these two positions cannot perform both functions apart from his or her own personal interests (FAMA; JENSEN, 1983; JENSEN, 1993).

On the other hand, the stewardship theory provides arguments in favor of a duality structure, emphasizing it can improve firm performance, indicating that a CEO, who is also COB, may have other motivations, different from pecuniary gains, while fulfilling his or her duties, such as achievement, recognition, and reputation (DURU; IYENGAR; ZAMPELLI, 2016; CHANG; LEE; SHIM, 2018). These motivations may encourage the CEO-COB to satisfy shareholders' interests by using trustworthy practices (DONALDSON; DAVIS, 1991). This theory also argues that organizations may benefit of CEO duality once an individual accumulating simultaneously these two top positions would show a strong leadership, providing more clarity regarding the corporate leadership for subordinate managers, other members of the corporate Board and even external parties (DONALDSON; DAVIS, 1991; DALTON et al., 1998). Furthermore, the CEO is often the individual who has the best firm-specific knowledge on strategic challenges and opportunities (JENSEN; MECKLING, 1995). Because of this aspect, the costs of transferring and processing information may be reduced in a unified leadership structure, and the decision-making process may become more effective, quicker and more flexible to adjustments (BRICKLEY; COLES; JARRELL, 1997; CHANG; LEE; SHIM, 2018).

More recently, scholars have tried to expand beyond the dichotomy between agency-stewardship theory as they study this subject. Most of them argue that the implications of a unified or a separate leadership structure are conditional to a set of factors, which may be summarized in "how" and "when" such unification or separation takes place (BOYD, 1995; KRAUSE; SEMADENI, 2013). From an angle of separation of titles, Krause & Semadeni (2013) classified "how" the change from duality to non-duality happens into three alternatives. Each of them affects firms differently.

The first alternative, known as "apprentice separation", occurs with the former CEO-COB remaining in the position of COB. The literature points that this form of

separation is most likely to be reversed to duality status in the future, once it usually occurs as a transitional component of a succession process, in which the new CEO will be monitored by the Board until he or she is considered to be ready to fully assume both authority positions in the firm. In some cases, however, the former CEO-COB stays as COB indefinitely and with such permanent structural change, it is very unlikely that the new CEO will alter the course of the firm current direction, for fear of offending his or her predecessors (BRICKLEY; COLES; JARRELL, 1997; HARRIS; HELFAT, 1998; KRAUSE; SEMADENI, 2013).

The second alternative, called “demotion separation”, consists on keeping the former CEO-COB only as CEO. Krause & Semadeni (2013) argues that this kind of separation is the one most likely to end up being just a governance play if the new COB cannot act independently. Provided that the new CEO is able to fulfill his or her duties apart from the former CEO-COB wishes, this alternative of separation sends a strong message that the firm needs changes in its direction, and the new independent COB is expected to actively monitor such transformation.

The Board may also define an arrangement in which the former CEO-COB leaves both roles, and two different individuals are appointed in his or her place. This third alternative is labeled “departure separation” and although it can also be a part of a succession event, it looks different from apprentice separation, as it is a more direct transition to non-duality. Because of the significant structural change provided by the former CEO-COB departing the firm, it is not expected that past strategies — whether good or bad ones — are going to be perpetuated, especially assuming the existence of independence among the new people chosen as CEO and as COB (KRAUSE; SEMADENI, 2013).

In short, there is no obvious theoretical explanation as to which leadership setup is better for firms. Given the systemic differences between a unified and a separate configuration, one may also expect to observe differences in corporate outcomes depending on whether companies have a duality or a non-duality structure. As already mentioned, the existing literature also highlights some scenarios in which firms may be favored by one structure or another — the question of “when” to unify or to separate the titles. We provide some discussions on this matter together with an overview of the existing empirical literature related to CEO duality on the next subsection.

2.2 PRIOR EMPIRICAL RESEARCH

The existing literature on the association of CEO duality with corporate outcomes is not recent and has found mixed results. Most of the prior empirical research either has been able to explore non-coercive regulations in an attempt to deal with endogeneity concerns related to firms’ leadership structure or has limited their analyses to investigate correlations on this subject.

Rechner & Dalton (1991) compares the performance of 141 non-financial “Fortune 500” firms over a six-year period (1978-1983) and found a positive correlation between non-duality and firm performance. More recently, this association was also detected by other studies in different contexts (DURU; IYENGAR; ZAMPELLI, 2016; LEW; YU; PARK, 2018; HSU et al., 2019). These results contrast to Baliga, Moyer & Rao (1996)’s work, in which they studied 181 “Fortune 500” non-financial firms for a period of 6 years (1986-1991). They showed that changes in firms’ leadership structure do not affect corporate performance, nor market outcomes, immediately after such change. Their results, however, indicated a weak positive correlation with long-term performance.

Dahya, Lonie & Power (1996) explored the issuance of a regulation that, among other aspects, recommended the split of the position of CEO and COB and investigate 124 non-financial firms from U.K. during 4 years (1989-1992). Their results suggest that market responds favorably to the announcement of the split of CEO and COB roles from the same individual and corporate performance appears to decline after this change. Later, Dahya & McConnell (2007) and Dahya, Garcia & Bommel (2009) rectify these findings, when they explored the same regulation in the same market, but with a larger sample. They studied 1,124 non-financial firms for a period of 8 years (1989-1996) and their results indicated no association of the definition of firms’ leadership structure with performance and market outcomes.

Brickley, Coles & Jarrell (1997) study 264 companies for an eight-year period (1984-1991) and found that non-duality is associated with lower performance and market outcomes. The same links were also found by Dey, Engel & Liu (2011), as they explored a scenario in which firms were facing a pressure by investors to split the CEO and COB positions and investigated 232 non-financial firms over 9 years (2001-2009). Such results diverge from Larcker, Ormazabal & Taylor (2011), who found no statistical indication that market outcomes are related to leadership structure. They explored legislative actions which indicated the possibility of a ban on CEO duality and conducted their analysis using a sample of 3,451 non-financial firms for the time period of January 2007 to June 2009. These three studies were conducted using data from the U.S. market and limited their sample to the period after the passage of regulatory changes that recommended non-duality.

Other studies, in different contexts, suggest that correlation sign and magnitude of the leadership structure-performance vary by industry. Boyd (1995) obtained this finding when studying 192 non-financial U.S. companies in 1980, as Elsayed (2007) came to this conclusion upon investigating 92 non-financial Egyptian listed firms over a five-year period (2000-2004). Evidences of heterogeneity is also presented by Palmon & Wald (2002), who argue that smaller firms benefit more from a leadership structure concentrated in a single individual, both in market outcomes and in corporate performance. Krause & Semadeni (2013) point that the split of leadership roles is positively (negatively) related to future firm

performance when current performance is poor (high) and that such relation is stronger for the cases of demotion separation (i.e., former CEO-COB is kept only as CEO).

Few works applied identification strategies to circumvent endogeneity issues related to CEO duality. Iyengar & Zampelli (2009) investigated the impact of CEO duality on corporate performance by employing instrumental variables. They conducted their analyses using four different measures — one-year total market return to shareholders, return on assets, Tobin's Q, and earnings per share (deflated by beginning-of-year stock price) — and found no evidence that firms optimize their performance. Yang & Zhao (2014) explored a regulation that changed the competitive environment and impacted each corporation in a different magnitude. They used such a regulation as an exogenous shock, even though it did not necessarily require the separation of titles of CEO and COB from the same person. They argue that this regulation served as a tool to discourage firms to keep CEO duality. They found that firms would benefit from a duality leadership structure, with an increase of 3-4%, on average, in their performance outcomes. Such results were obtained using Tobin's Q as corporate performance measure. They found a weaker effect when testing with Return on Equity and no effect with Return on Assets.

With a similar strategy, Chang, Lee & Shim (2018) used as an exogenous variation the issuance of a regulation that stimulated corporate governance reforms. Also, they included the Global Economic Policy Uncertainty (GEPU) indexes to examine how firm performance is affected in scenarios of political uncertainty. Their results suggest that firms experienced a reduction in their performance if they had separate leadership before the regulation became effective, and this negative effect was mitigated if a firm had combined leadership prior to the regulation. In addition, they show that firms with CEO duality had a performance improvement of 7%, on average, for each additional increase in the policy uncertainty index. They used the Total Q measure as a proxy for corporate performance.

In sum, we observe a lack of consensus in the existing empirical literature on the relation of CEO duality with corporate outcomes, a perception also highlighted by Dalton et al. (1998), Dahya & Travlos (2000), Rhoades, Rechner & Sundaramurthy (2001), Adams, Hermalin & Weisbach (2010), Dalton & Dalton (2011) and Krause, Semadeni & Cannella Junior (2014), upon conducting separate extensive surveys on the literature.

3 INSTITUTIONAL BACKGROUND

The Brazilian Stock Exchange created in December 2000 special listing segments in order to encourage publicly listed companies to reach differentiated governance levels. Initially, B3 launched three segments: New Market (NM), Corporate Governance Level 1 (L1) and Corporate Governance Level 2 (L2). In 2012, two more segments were created, B+ and B+ Level 2. To assign to one of these segments, companies have to comply with rules defined at the segment’s regulation⁴ under a contract with B3. These rules establish obligations for listed firms that go beyond the ones required in the Brazilian Corporate Law.⁵

Eventual reforms may happen to these segments, such that corporate governance practices prescribed in their respective regulations must be aligned with practices adopted internationally. To date, this happened three times: in 2006, in 2011 and in 2017.⁶ In the 2011 reform, the regulations of the existing segments at that time — NM, L1, and L2 — were altered to add new rules and to update terms used in them. The main changes included requirements related to the formalization of some additional aspects of protection for minority investors; to the creation of a statutory audit committee; to the creation and disclosure of a securities trading policy and a code of conduct to which all managers and directors are to be subject; and to the prohibition on the accumulation of the CEO and COB positions by the same person. These requirements came into effect as of May 10th, 2011.

We explore the 2011 regulatory change and use the last aforementioned rule as an exogenous shock that forced firms to change to non-duality structure. Companies listed within L1, L2 or NM prior to the regulatory change had a maximum period of three years to commit with the norms since the regulation became effective. Additionally, they had to amend their bylaws to also prescribe such requirements. Exceptional cases would be analyzed by B3 to allow a longer period.⁷ For corporations that entered these segments afterwards 2011 reform, the three-year deadline started from the date they began trading their shares in the chosen segment. Although there is the possibility of firms complying with non-duality jointly with some other requirement, we have no reason to believe it would “confound” our results, once we observe no clear pattern between the timing of firms changing their leadership structure and the timing of disclosure of their amended bylaws.

⁴ All segments’ regulations are available at <http://www.b3.com.br/pt_br/regulacao/estrutura-normativa/listagem/>.

⁵ Federal Law number 6.404/1976 and its amendments, available at <http://www.planalto.gov.br/ccivil_03/leis/l6404consol.htm>.

⁶ The changes provided by these reforms are available at <http://www.b3.com.br/pt_br/regulacao/regulacao-de-emissores/atuacao-normativa/revisao-dos-regulamentos-dos-segmentos-especiais-de-listagem.htm>.

⁷ In our sample, we observe one company fitting to this exception. Accordingly, we check robustness of our results by dropping such case.

Prior research had only been able to explore regulations in which CEO non-duality were merely suggested (DAHYA; LONIE; POWER, 1996; DAHYA; GARCIA; BOMMEL, 2009; LARCKER; ORMAZABAL; TAYLOR, 2011), or scenarios that affected firms' operational environment (YANG; ZHAO, 2014; CHANG; LEE; SHIM, 2018). Although these settings may incentive corporations to change their leadership structure, the choice to keep a unified or a separate structure is still endogenous. The unique setting we explore provides an interesting opportunity to evaluate the consequences of non-duality, as it allows us to exploit a strong mandatory rule directly requiring the separation of the CEO and COB positions from the same individual.

We are aware that entering one of the special listing segments is endogenous, since firms choose to voluntarily join them. However, some of the regulatory requirements may guarantee firms' permanence once they access the chosen segment. The goal is to protect minority shareholders who have invested in a company with a higher level of corporate governance. The process of delisting from L2 and NM segments is conditional both to a public tender offer and to the shareholders' approval at a general meeting. Firms assigned to L1 must attend exclusively to the last condition. Given that these demands to exit a segment may be costly to both shareholders and corporate managers, and since only one company was ever delisted upon request,⁸ we have no reason to believe that these firms may easily avoid these regulatory changes. As we elaborate further, the setting provided by this regulatory change is essential for our empirical strategy.

⁸ The company Unipar Carbocloro S.A. filed a request in 2011 to exit the L1 segment. A history of listing and delisting in the special segments are available at <http://www.b3.com.br/pt_br/produtos-e-servicos/solucoes-para-emissores/segmentos-de-listagem/>.

4 DATA SOURCES AND SUMMARY STATISTICS

4.1 SPECIAL LISTING SEGMENTS

B3's website provides information on all companies listed on L1, L2 and NM, including a history of listing and delisting dates.⁹ Given the endogeneity related to the entry into one of these segments, as discussed in Section 3, we did not consider any firm that became part of one of them after the 2011 reform. We excluded firms in pre-operational stages, the ones with negative book value of equity, and those operating in the financial sector, as they are subject to different regulations.

4.2 CEO DUALITY

We hand-collected information on CEO duality for all firms from the three special listing segments in the time span between 2010 and 2015. The main source to identify CEO duality is the Reference Form (RF), which is a document disclosed by Brazilian firms required by the Brazilian Securities and Exchange Commission (*Comissão de Valores Mobiliários* — CVM). Among other topics, the RF provides detailed information on the companies' main activities, risk factors, capital structure, securities issued, and relevant financial data. Importantly, the RF has information on the leadership and Board structure, with identification of its members, dates of election, mandates duration and other relevant descriptions.¹⁰

We first analyzed RFs available at B3's website for each firm-year to identify whether the CEO has also served as COB, as well as the dates of their election. Thus, we could register the precise moment when a firm changed to a non-duality structure. Importantly, the CEO is traditionally elected at the Board of Directors' meetings, and Board members are usually elected at shareholders' meetings. The COB may be defined at either of these meetings. The decisions are disclosed in the minutes of these meetings. Such disclosure may happen at the same day of the event or in a different day from the election date. Based on these considerations, we checked the date that the firm filed the minutes to the B3's website and considered it as the date of disclosure.

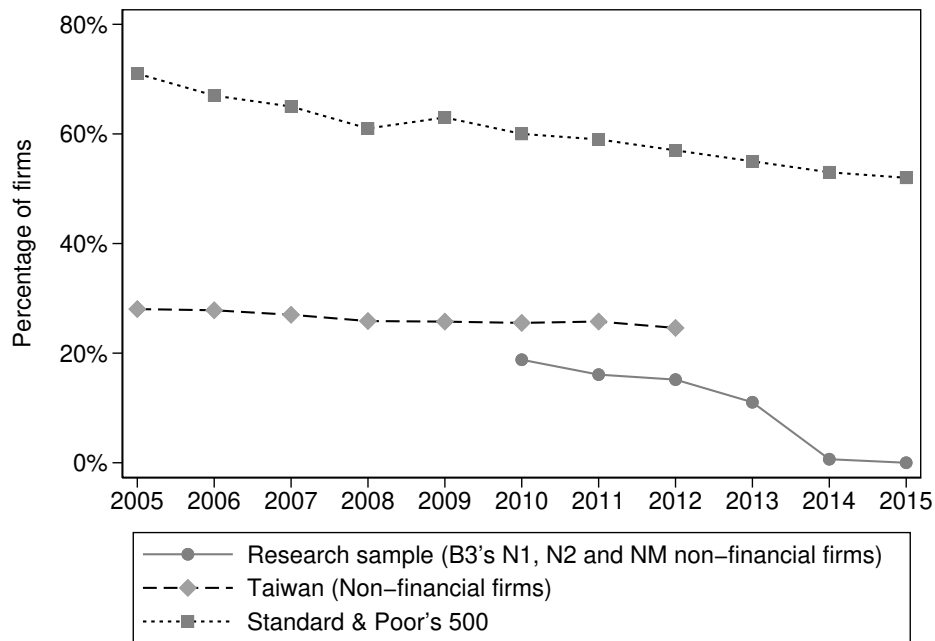
Figure 1 depicts trends in splitting of titles for firms operating in the three listed segments at B3 in the time span between 2010-2015. The vertical axis shows the percentage of firms fitting this configuration. Additionally, it jointly reports the percentage of firms with CEO duality for Taiwan and the U.S.. As compared to Taiwan, Brazil presents similar rates of firms with the duality structure before the regulation becomes effective. As emerging economies, both countries contrast to U.S. levels. Taken together, only the

⁹ See <www.b3.com.br>

¹⁰ The full list of contents to be disclosed in the RF and other requirements are determined at the Article 24 and Annex 24 of CVM Instruction 480/2009, available at <<http://www.cvm.gov.br/legislacao/instrucoes/inst480.html>>.

Brazilian sample presented a visually marked change in the leadership structure. This descriptive evidence highlights the enforcement of the regulation.

Figure 1. Trends of CEO duality proportion among the firms in our sample, Chinese firms and Standard & Poor's (S&P) 500 index listed firms



Notes: This figure presents time trends of the percentage of firms with CEO duality among the firms in our sample (non-financial firms listed in B3's special listing segments, for the period of 2010-2015), Taiwanese non-financial firms (2005-2012) and U.S. firms listed in Standard & Poor's (S&P) 500 (2005-2015). We obtained information for the Taiwanese market from Hsu et al. (2019), whose research used a sample with all non-financial companies listed on the Taiwan Stock Exchange (TWSE) and Taipei Exchange (TPEX or OTC). The percentage of S&P' 500 firms with CEO duality comes from Larcker & Tayan (2016).

In order to make causal claims, we limited our sample to companies that eventually had CEO duality and split the titles of CEO and COB between 2011 and 2015. This delivers us 24 distinct companies. Table B.1 in the Appendix presents information on how the sample is composed and Table B.3 lists the names of every firm with which we conduct our research.¹¹

4.3 FINANCIAL DATA

We obtain financial data for our sample from Economatica. This administrative data set contains detailed information on financial statements and stock prices for all Brazilian listed firms since 1986. In order to construct the outcomes related to corporate performance, we gathered quarterly data from firms' financial statements, as well as information on number of shares and stock prices in the closing date of each statement.

¹¹ See Figure A.1 in the Appendix for the distribution of firms by industry.

We segregate our analysis of corporate performance into two categories: (a) market-based measures of performance, which includes Market-to-Book and Tobin's Q indexes and; (b) accounting-based measures of performance, which includes Return on Assets and Return on Equity. From the theoretical perspective, such categories represent different dimensions of corporate performance. The market-based measures capture shareholders' expectations of future returns from firm performance and they are believed to indicate the value of a firm. The indicators of accounting-base are a reflection of past or short-term performance, which assess operational profitability (VENKATRAMAN; RAMANUJAM, 1986; ROWE; MORROW JUNIOR, 1999).

To investigate some potential mechanisms, we use daily information on stock prices and returns for the additional stock-level outcomes; and quarterly data from the financial statements for the construction of the additional firm-level measures. Table B.2 lists the full set of variables and provide their description.

We use different time frames depending on which dependent variable is being analyzed. When analyzing corporate performance and the additional firm-level measures, we need a time window with enough data variability that allows to investigate pre-trends, as well as the average and the dynamic effects on our outcomes of interest. We regard the time period between 2010 and 2017 to be sufficient to do so. For high-frequency stock market outcomes, we collected data for the same period and adjusted the time frame to a window close enough to the announcement of firms starting to comply with the new regulation.

4.4 SUMMARY STATISTICS

Table 1 presents the summary statistics for our sample. Panel A lists information on the corporate performance indexes, and Panels B and C show information for stock- and firm-level outcomes, respectively. We segregate and present the summary statistics in three fashions. The first, presented in Columns 1-3, consists on all N1, N2 and NM listed firms. The second, shown in Columns 4-6, refers to all data from our sample. The third, displayed in Columns 7-9, describe the data in our sample at the baseline period.

As already mentioned, our sample comprises a bit less than 20% of all firms in the special segments. However, even with limiting to this rate, there is no considerable difference between them and the full set of firms listed in N1, N2 and NM. Also, summary statistics from our sample are much alike the ones of other markets for most outcomes we use. To illustrate, Tobin's Q is quite similar, on average, to firms in the Taiwanese and in the U.S. market. Further, data on this variable for our sample firms are slightly more disperse than for the ones from Taiwan, and they are very similar to the standard deviation from the ones of the U.S. (YANG; ZHAO, 2014; HSU et al., 2019).

Table 1. Summary Statistics

	All N1, N2 and NM firms			Sample (All data)			Sample (Baseline)		
	Mean (1)	SD (2)	N (3)	Mean (4)	SD (5)	N (6)	Mean (7)	SD (8)	N (9)
<i>Panel A. Corporate performance outcomes</i>									
<i>Market-based measures:</i>									
Tobin's Q	1.585	1.198	3,713	1.697	1.369	785	1.903	1.670	24
Market-to-Book	2.278	3.652	3,713	2.438	4.611	785	2.382	2.272	24
<i>Accounting-based measures:</i>									
Return on Assets	0.043	0.082	3,789	0.035	0.109	797	0.042	0.069	24
Return on Equity	0.092	0.225	3,789	0.078	0.199	797	0.072	0.104	24
<i>Panel B. Additional stock-level outcomes</i>									
Mean Adjusted Abnormal Returns	0.000	0.028	254,311	0.000	0.027	43,210	0.004	0.024	24
(Log)Prices	2.556	0.840	254,478	2.513	0.853	43,212	2.429	0.714	24
<i>Panel C. Additional firm-level outcomes</i>									
<i>Investing activities:</i>									
Corporate Investment	0.060	0.136	3,789	0.054	0.147	797	0.123	0.494	24
Fixed-Assets Ratio	0.122	0.171	3,789	0.086	0.150	797	0.088	0.150	24
<i>Financing activities:</i>									
Leverage Ratio									
Market Leverage	0.227	0.209	3,713	0.206	0.176	785	0.216	0.181	24
Book Leverage	0.257	0.206	3,789	0.258	0.192	797	0.267	0.178	24
Debt Ratio									
Total	0.202	0.161	3,789	0.209	0.159	797	0.218	0.148	24
Short-Term	0.058	0.065	3,789	0.053	0.047	797	0.054	0.040	24
Long-Term	0.141	0.133	3,789	0.156	0.141	797	0.164	0.140	24

Notes. This table reports the descriptive statistics for the variables used in our analysis: corporate performance measures (Panel A); additional stock-level outcomes (Panel B) and additional firm-level outcomes (Panel C). Columns 1-3 present these statistics using data from all N1, N2 and NM firms. Columns 4-6 present these statistics using all data of our sample. Columns 7-9 presents these statistics for our sample in the baseline period.

5 IDENTIFICATION STRATEGY

As indicated by Adams, Hermalin & Weisbach (2010), board and leadership features are endogenously chosen. This implies firms self-selecting to duality structure may be correlated to other observed and unobserved characteristics. To mitigate this endogeneity issue, we exploit a regulatory change that compels companies to separate the CEO and COB positions from the same person. This particular design allows us to apply a differences-in-differences (DiD) strategy to analyze the impacts of CEO non-duality.

As showed in Figure 1, the separation between CEO and COB positions evolves differently across companies over time. Our main empirical specification is a panel fixed effects regression that exploits this timing of firms switching to non-duality, within the set of all firms that were directly affected by B3 regulatory reform to alter their leadership structure. We define this panel estimator by the following equation:

$$Y_{i,t} = \rho + \beta \times \text{Non-Duality}_{i,t} + \phi \times \text{Assets control}_{i,t} + \theta_i + \mu_t + \epsilon_{i,t}, \quad (1)$$

where $Y_{i,t}$ refers to an outcome of a given firm i at time t . $\text{Non-Duality}_{i,t}$ is an indicator variable for whether the firm has splitted the CEO and COB positions from the same person at moment t . $\text{Assets control}_{i,t}$ is the log of book value of total assets at moment t , and it is a measure used to capture firm size in our regressions. θ_i represent firm fixed effects and account for time-invariant unobserved firm-level heterogeneity. μ_t are time fixed effects and control for common shocks that affect all firms homogeneously. Lastly, $\epsilon_{i,t}$ is an idiosyncratic term. The coefficient β summarizes the impact of non-duality on our outcomes of interest. Additionally, we use robust standard errors to account for heteroskedasticity.

To explore further the changes in corporate performance before and after non-duality, we take advantage of having precise information on disclosures of such events and apply a more flexible empirical model, in addition to the standard DiD setting. Specifically, this regression model takes the following event-study form:

$$Y_{i,t} = \alpha + \sum_{k=-M}^M \beta_k \times \text{Non-Duality}_i \times D_k + \phi \times \text{Assets control}_{i,t} + \theta_i + \mu_t + \varepsilon_{i,t}, \quad (2)$$

with D_k being quarter-year specific dummies. The coefficients β_k capture pre-trends for periods with $k < 0$ and dynamic treatment effects for $k \geq 0$. $\varepsilon_{i,t}$ is an error term. The remaining variables represent the same terms as in Equation 1. Our key source of variation comes from the interaction between a dummy for being treated (i.e., from the event on) and time fixed effects. The parameters of interest are thus identified using within-variation in the outcome of eventually-treated firms at each time period.

The identifying assumption is that firms developed in similar trends prior to the compliance of the rule and all further changes are solely consequences of the new leadership structure. Since switching to non-duality structure occurred not randomly over time, our identification would be compromised if we observe systematic differential paths

in the outcomes of treated and control units before the event. Accordingly, we investigate if changes in our outcomes of interests reflect pre-existing trends by checking statistical significance of the anticipatory effects (i.e., $\beta_{pre,t} = 0$). We show our results graphically, plotting ten leads ($-10 \leq k < 0$) and eleven lags ($0 \leq k \leq 10$), and omitting the -M and -1 leads, as recommend by Borusyak & Jaravel (2017). When estimating our results, we aggregate the oldest relative time dummies ($k < -10$) into a single variable and do the same for the most recent time dummies ($k > 10$). For the event-study analyses, we also use robust standard errors to account for heteroskedasticity.

6 RESULTS

Our results are divided into three parts. First, we show the effects of CEO non-duality on corporate performance. Then, we conduct some robustness checks for our main results. Lastly, we explore some mechanisms that may explain our findings.

6.1 CEO NON-DUALITY AND CORPORATE PERFORMANCE

Table 2 shows the average effects of CEO non-duality on several measures of corporate performance. Columns 1–2 present the results for Tobin’s Q. Column 1 is our full regression model, as described in Equation 1, including our variable of interest, firm and quarter-year fixed effects, and assets control. Column 2 is a restricted model, excluding the assets control variable. Columns 3–4, 5–6 and 7–8 repeat the same analyses and patterns of Columns 1–2 for Market-to-Book, Return on Assets, and Return on Equity, respectively.

The coefficients for non-duality is significantly positive for both market-based measures of performance; and although the evidences on the accounting-based measures are weaker, we still obtain positive effects. This suggests that corporations experience a significant increase in their performance in response to the separation of CEO and COB positions.¹²

Table 2. Impact of CEO Non-Duality on Corporate Performance

	Tobin’s Q		Market-to-Book		Return on Assets		Return on Equity	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Non-Duality	0.429*** (0.149)	0.604*** (0.179)	0.696** (0.320)	0.836*** (0.302)	0.018* (0.009)	0.015 (0.009)	0.039** (0.018)	0.029* (0.017)
N. of observations	756	756	756	756	765	765	765	765
R^2	0.805	0.756	0.272	0.269	0.456	0.444	0.292	0.270
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Assets control	Yes	No	Yes	No	Yes	No	Yes	No

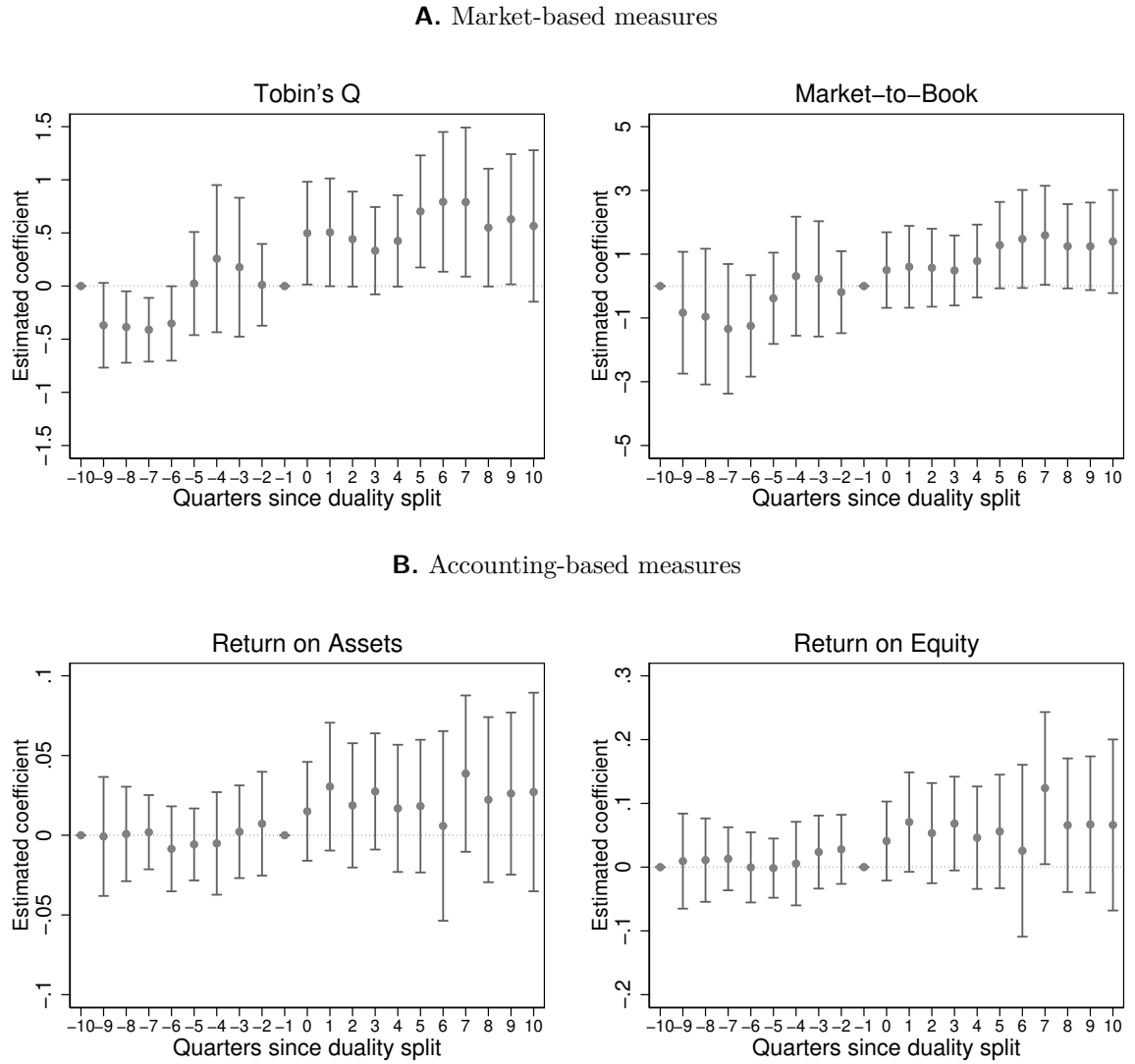
Notes. Robust standard errors are in parentheses. ***, * and * indicate significance at 1, 5 and 10 percent levels, respectively.

Our results diverge from prior research that exploited non-coercive regulations or any sort of exogenous shock affecting firms’ operational environment, which either found evidences suggesting that non-duality is disadvantageous for firms, especially when facing high competition and scenarios of policy uncertainty (DEY; ENGEL; LIU, 2011; YANG; ZHAO, 2014; CHANG; LEE; SHIM, 2018), or found no effect at all (DAHYA; LONIE; POWER, 1996; DAHYA; MCCONNELL, 2007; DAHYA; GARCIA; BOMMEL, 2009; IYENGAR; ZAMPELLI, 2009; HSU et al., 2019). Even though these shocks could have affected the relation between firms’ leadership structure and corporate performance,

¹² To illustrate, Tobin’s Q increases an average of 22.5% following the establishment of non-duality.

the adoption of a configuration of duality or non-duality is still endogenous. In this regard, we highlight that these previous studies were only able to investigate this matter from a perspective of firms voluntarily choosing a unified or a separate structure, once none of them had the opportunity to explore a mandatory rule banning CEO Duality.

Figure 2. Impacts of CEO Non-Duality on Corporate Performance



Notes: This figure presents the dynamic impact of the change in leadership structure on market- and accounting-based measures of corporate performance. Each graphic plots the estimated coefficients $\beta_{pre,m}$ and $\beta_{post,n}$ obtained from equation 2. The vertical lines represent confidence intervals at 95% levels. All specifications include firm and quarter-year fixed-effects, and assets control. Coefficients are estimated with robust standard errors to heteroskedasticity.

To investigate the dynamic evolution in firms performance, we regress our outcomes of interest on a set of time dummies, which indicate the number of quarters before or after the new leadership configuration is defined, by using Equation 2. Figure 2 plots the results for this analysis. The size of coefficients from the leads and their respective confidence intervals suggest that all four outcomes evolve in common-trends long before

the leadership structure change (at least 5 quarters early). The estimated coefficients show that the dynamic DiD effects appears to have similar positive patterns of behavior for both categories of corporate performance. Corroborating with the findings of Table 2, we also observe stronger evidences for the market-based measures in comparison to the accounting-based ones.

In sum, our results indicate that splitting the CEO and the COB titles from the same individual may overcome potential agency costs that arise from this separation. Such findings suggest that non-duality provides substantial advantage in decision-making processes in order to maximize shareholders' wealth.

6.2 ROBUSTNESS CHECKS

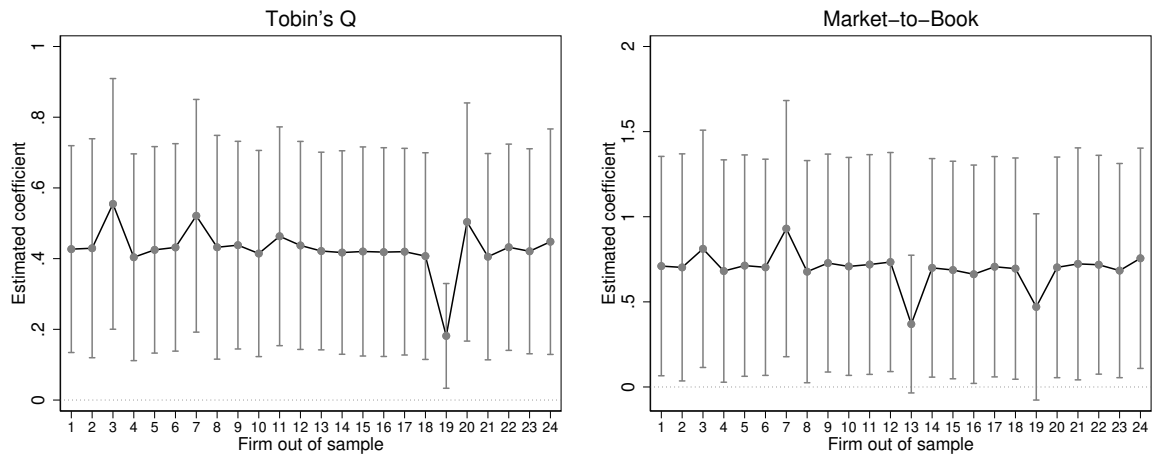
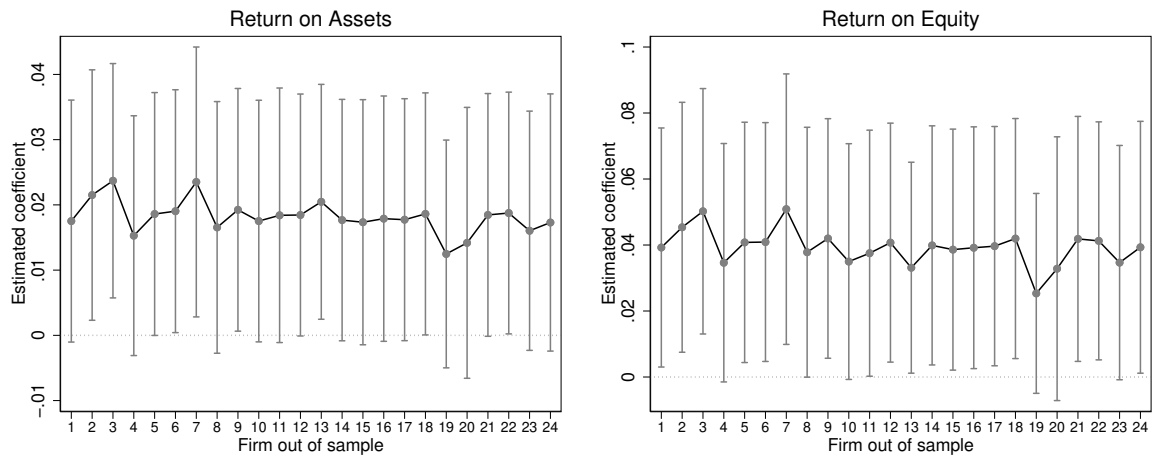
In this subsection, we show that our main findings are robust to a range of sample adjustments, ways of calculating standard errors, and model specifications. Since our sample comprises few complier companies (as shown in Table B.1 in the Appendix), one may argue that the statistical power of our analyses is low. However, even with this sample limitation, we still obtain overall precise estimates. We support this statement based on our first robustness check, in which we run Equation 1 several times excluding one firm of our sample at each estimation. Results are depicted in Figure 3 and they are qualitatively the same as the ones in Table 2.

As we mentioned in Section 3, one of the companies in our sample was granted by B3 an extra time to comply with the non-duality rule. This company is identified with number "7" in Figure 3.¹³ Although the exclusion of this company leads to an increase in the value of the coefficients in all four outcomes, such change is not considerably different from the results obtained with the exclusion of the other firms that changed to non-duality in the original three-year deadline since the regulatory reform. Further details on the single and on the dynamic DiD effects when excluding this late complier firm are presented in Table B.4 and in Figure A.4 in the Appendix.

Additionally, we redo this exercise of "adjusting" the sample, by removing the firms of each industry. The obtained estimates for these regressions, plotted in Figure A.2 in the Appendix, show that our findings remain similar to the ones previously reported in magnitude and in statistical significance. We lay special emphasis on such coherence even after excluding the "Consumer cyclical" industry, which accounts for 50% of firms in our sample. This stability in the average effect of non-duality on corporate performance suggests that our findings are not driven by any specific company or business industry.

Our estimates are also robust to different ways of calculating standard errors, as shown in Table B.5 in the Appendix. We apply wild bootstrap method, with and without clustering. Although statistical significance is lost at conventional levels for most of our

¹³ Table B.3 in the Appendix identifies all publicly traded companies in our sample.

Figure 3. Impacts of CEO Non-Duality on Corporate Performance Excluding Firms**A. Market-based measures****B. Accounting-based measures**

Notes: This figure presents the average impact of the change in leadership structure on market- and accounting-based measures of corporate performance. Each graphic plots the estimated coefficients β obtained from equation 1, and each of such coefficients refers to a regression without one firm of our sample. The vertical lines represent confidence intervals at 95% levels. All specifications include firm and quarter-year fixed-effects, and assets control. Coefficients are estimated with robust standard errors to heteroskedasticity.

analyses as we include firm clusters, we still obtain *p-values* around the limit of 10 percent. When re-calculating standard errors without including firm clusters, statistical significance persists for all measures of performance.

Next, to assess whether our results are sensitive to alternative specifications, we add some different controls to our empirical model. Table 3 reports such analyses. Columns 1, 3, 5, and 7 show the results of Equation 1 with the inclusion of an industry-quarter fixed-effect, in order to additionally control for homogeneous shocks that affects firms of the same industry in specific quarters over the course of an year. For columns 2, 4, 6, and 8, we segregate the quarter-year fixed-effect into two, running regressions with a quarter and a year fixed-effect.

Table 3. Impact of CEO Non-Duality on Corporate Performance — Alternative Controls

	Tobin's Q		Market-to-Book		Return on Assets		Return on Equity	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Non-Duality	0.427*** (0.157)	0.337*** (0.130)	0.673** (0.339)	0.611* (0.328)	0.017** (0.009)	0.017* (0.009)	0.036** (0.017)	0.035** (0.017)
N. of observations	756	756	756	756	765	765	765	765
R^2	0.807	0.798	0.279	0.260	0.490	0.427	0.334	0.275
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter-Year FE	Yes	No	Yes	No	Yes	No	Yes	No
Assets control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Quarter FE	Yes	No	Yes	No	Yes	No	Yes	No
Quarter FE	No	Yes	No	Yes	No	Yes	No	Yes
Year FE	No	Yes	No	Yes	No	Yes	No	Yes

Notes. Robust standard errors are in parentheses. ***, * and * indicate significance at 1, 5 and 10 percent levels, respectively.

In order to verify whether our results are estimated correctly, we run permutation tests for our main outcomes of interest. We do so by randomly generating false dates for firms switching to non-duality, and then running Equation 1 as if the false dates were the correct ones. We run this estimation 500 times. Figure A.5 in the Appendix shows the distribution of β and the placebo estimates of non-duality on corporate performance. For Tobin's Q (first panel), Return on Assets (third panel), and Return on Equity (fourth panel), the placebo estimates do not attain our main estimates at conventional inference benchmarks. As for Market-to-Book (second panel), we cannot discard the possibility of the estimates for this measure being obtained “by chance”, as we detect significant effect with the randomly generated dates.

6.3 POTENTIAL MECHANISMS

The ban on accumulation of titles leading to an increasing of performance could be driven by different mechanisms; e.g., market overconfidence, actual changes in the

investment profile, financing choices, among others. We now explore some potential channels that might explain such changes.

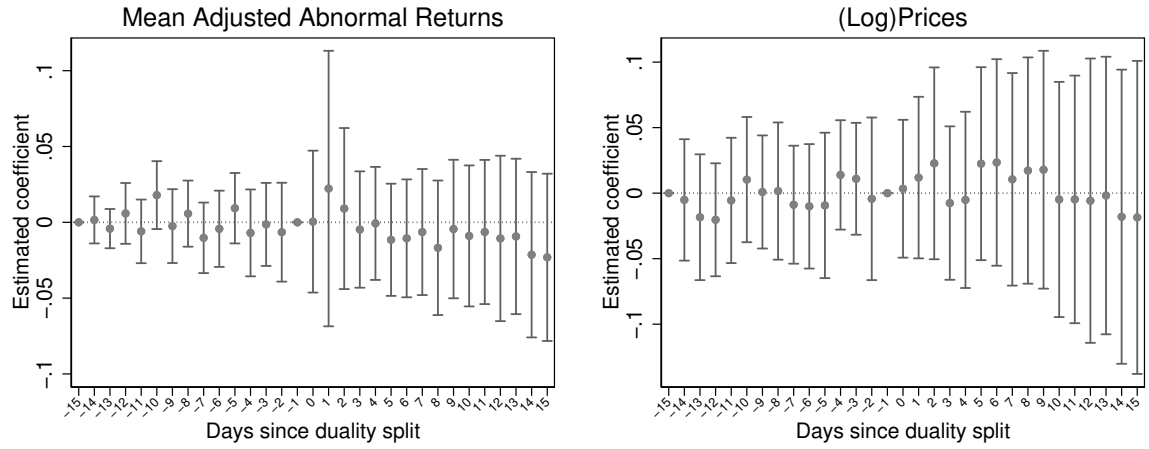
6.3.1 Dynamic Effects on Stock-Level Outcomes

As discussed in the previous subsections, the effects on firms' value appear more instantly and they are more stable than on profitability indexes. Given that Tobin's Q and Market-to-Book are partially composed by stock market information, we initially investigate whether companies' stock prices and returns are affected by the announcement of non-duality. We do so in order to assess if the timing of investors' reaction is immediate to the disclosure of this change, or if such reaction is only observed later — which may point out to effects arising due to the new managerial choices.

Figure 4 displays the estimated coefficients for the market outcomes obtained from the event-study analysis. We include observations within a window of 15 days before and 15 days beyond around announcement dates. Restricting to a narrow range around the treatment event strengthens the understanding of investors' reaction instead of an adjustment in management practices. Following the disclosure event, we observe no significant changes in the trends of stock prices and returns. The lack of market reaction we document is in line with findings obtained in the context of larger capital markets (BALIGA; MOYER; RAO, 1996; DAHYA; LONIE; POWER, 1996; DAHYA; MCCONNELL, 2007; DAHYA; GARCIA; BOMMEL, 2009; LARCKER; ORMAZABAL; TAYLOR, 2011). This suggests that economic context and size of market do not play a role on this short-run behavioral response. Figure A.6 in the Appendix show the results are robust to applying distinct time windows.

Two reasons may explain these results. First, the lack of reaction may be because investors already anticipated the regulatory change. As the 2011 reform was made public before corporations commit to the new rules, market players might have absorbed the effects of changing the organizational structure very early. Another possible explanation is that changing leadership structure *per se* is not perceived as a good governance practice. If this is the case, what really matters from the investors' perspective is the management ability to maximize shareholders' wealth.

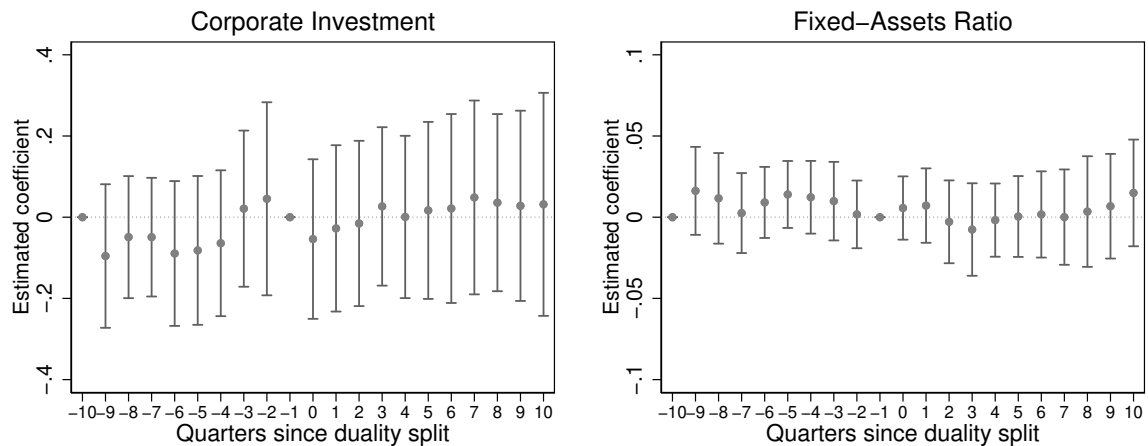
From this perspective, the perceived effects in performance measures of these corporations would derive from modifications in management strategies or changes in their Boards' monitoring capacity. To investigate further this assumption, we analyze next how a set of firm-level outcomes — related to investing and financing activities — are affected following the change in firms' leadership structure; and explore whether there is heterogeneity in the impacts on performance depending on the type of separation.

Figure 4. Impacts of CEO Non-Duality on Stock-Level Outcomes

Notes: This figure presents the dynamic impact of the change in leadership structure on stock prices and abnormal returns. Each graphic plots the estimated coefficients $\beta_{pre,m}$ and $\beta_{post,n}$ obtained from equation 2. The vertical lines represent confidence intervals at 95% levels. All specifications include firm and day fixed-effects. Coefficients are estimated with robust standard errors to heteroskedasticity.

6.3.2 Effects on Investing and on Financing Activities

Fama & Jensen (1983) and Opler et al. (2001) argue that companies make better investment choices when their management style is able either to increase the quantity of profitable investments or reduce investment in risky projects. In this regard, we study corporate investment policy from two perspectives: (i) the volume of capital expenditures and; (ii) the proportion of fixed-assets to total assets. Figure 5 shows flat trends on corporate investment policy, which indicates that the volumes of capital expenditures and fixed-assets do not significantly change as compared to firms' total assets.

Figure 5. Impacts of CEO Non-Duality on Investing Activities

Notes: This figure presents the dynamic impact of the change in leadership structure on investing activities. Each graphic plots the estimated coefficients $\beta_{pre,m}$ and $\beta_{post,n}$ obtained from equation 2. The vertical lines represent confidence intervals at 95% levels. All specifications include firm and quarter-year fixed-effects, and assets control. Coefficients are estimated with robust standard errors to heteroskedasticity.

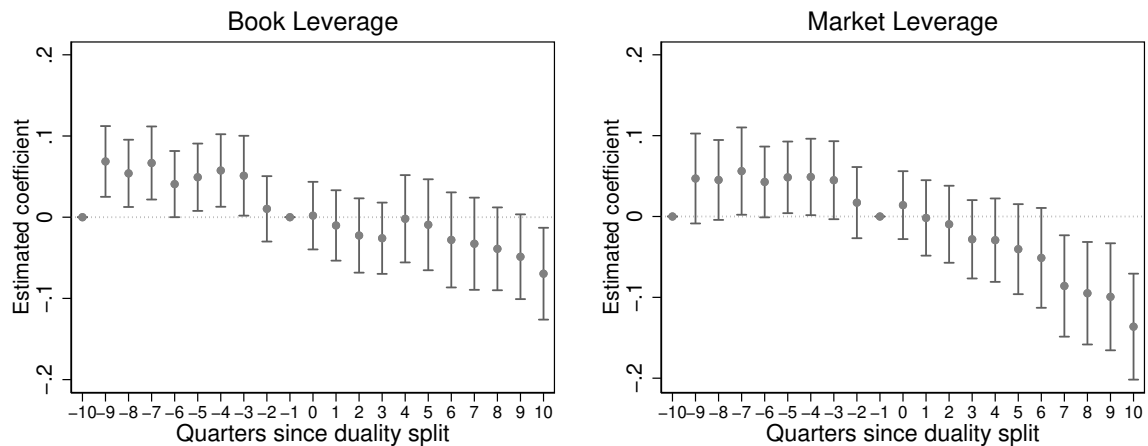
The literature on capital structure highlights that financing behavior may be another potential channel for firms' performance.¹⁴ We investigate this subject by examining leverage and debt ratios responses to non-duality structure.

An effect of decrease can be observed on firms' leverage, as depicted in Figure 6. This may suggest managerial efforts to reduce the proportion of debt when compared either to the book value of equity (first panel) or to the market value of equity (second panel) — with a more evident impact on the latter.

Figure A.7 in the Appendix also reports similar impact of decrease on the level of debt ratio, which is driven by short-term debt. When firms reduce their current financial liabilities, they proportionally increase the maturity of their total debt. By doing so, managers can reduce both the risk of having more debt than they can afford to pay, and the risk of end up needing to refinance existing debts (i.e., rollover risk) (MYERS, 1977; DIAMOND; HE, 2014; ADMATI et al., 2018). This action of lowering short-term debt as an attempt to reduce the risk of facing difficulties to finance future projects does not seem to affect firms' results, as we observe no effect on Net Revenues or Net Income.¹⁵ However, shareholders may perceive this financing behavior as more effective, which could potentially influence changes in firms' value. Also, accounting profitability measures could be increasing because of such changes happening simultaneously to the stability in corporate investment policy.

¹⁴ See Harris & Raviv (1991), Lemmon & Zender (2010), Diamond & He (2014) and Admati et al. (2018) for a deep discussion about this topic.

¹⁵ See Figure A.3 in the Appendix.

Figure 6. Impacts of CEO Non-Duality on Leverage Ratios

Notes: This figure presents the dynamic impact of the change in leadership structure on leverage ratios. Each graphic plots the estimated coefficients $\beta_{pre,m}$ and $\beta_{post,n}$ obtained from equation 2. The vertical lines represent confidence intervals at 95% levels. All specifications include firm and quarter-year fixed-effects, and assets control. Coefficients are estimated with robust standard errors to heteroskedasticity.

Table B.6 in the Appendix reports the estimated coefficients when running Equation 1 with the inclusion of Debt and Leverage Ratios. Such results remain mostly similar to the ones obtained from our main specification. This suggests that although we find evidences of changes in corporate financing choices following non-duality, this particular feature does not seem to be a remarkable channel to explain the increase in corporate performance.

6.3.3 Average Effects on Corporate Performance with Restricted Samples

In our sample, we observe the occurrence of the three categories on the possible forms of conversion to non-duality mentioned in Krause & Semadeni (2013): apprentice (i.e., someone else takes over as CEO); demotion (i.e., someone else takes over as COB); and departure (i.e., the current CEO-COB is replaced by two different individuals).¹⁶

Given the limited number of firms in our sample, we are not able to fully explore such alternatives. As an attempt to understand in which groups the impacts are more pronounced, we address this topic of “how” the separation is carried out by focusing only on demotion and departure separations. According to Table 4, both possibilities are beneficial, however the adoption of non-duality without CEO change leads to more expressive effects on corporate performance.

After switching to non-duality while keeping the former CEO-COB in one of the

¹⁶ See Table B.3 in the Appendix for a description of how firms chose to split the CEO and COB titles. We observe apprentice separation in 12 firms; demotion separation in 11; and departure separation in 1.

Table 4. Impact of CEO Non-Duality on Corporate Performance — Restricted Samples

	Dependent variable			
	Tobin's Q (1)	Market-to-Book (2)	Return on Assets (3)	Return on Equity (4)
<i>Panel A. Sample restricted to firms with apprentice separation</i>				
Non-Duality	0.437** (0.174)	0.410 (0.261)	0.025** (0.012)	0.050** (0.022)
N. of observations	377	377	384	384
R^2	0.830	0.767	0.527	0.487
Firm FE	Yes	Yes	Yes	Yes
Quarter-Year FE	Yes	Yes	Yes	Yes
Assets control	Yes	Yes	Yes	Yes
<i>Panel B. Sample restricted to firms with demotion separation</i>				
Non-Duality	0.651*** (0.202)	1.005 (0.752)	0.041** (0.019)	0.068** (0.034)
N. of observations	347	347	349	349
R^2	0.859	0.261	0.423	0.253
Firm FE	Yes	Yes	Yes	Yes
Quarter-Year FE	Yes	Yes	Yes	Yes
Assets control	Yes	Yes	Yes	Yes

Notes. Robust standard errors are in parentheses. ***, * and * indicate significance at 1, 5 and 10 percent levels, respectively.

positions, he or she either remains with the authority to monitor top-level executives and to evaluate the companies' strategies — as COB; or with managerial function over firms' operations — as CEO (JENSEN; MECKLING, 1979; JENSEN, 1993). Because of such distinct duties for these specific titles, each kind of duality split has different implications for corporations. As Krause & Semadeni (2013) argue, all alternatives are likely to affect corporate performance, however demotion separation suggests a greater potential for strategic reversal — in comparison to the apprentice alternative —, as this type of separation is more likely to impose independent oversight on the sitting CEO.

In sum, the existence of effects regardless of how firms adopted non-duality and the stronger impacts for demotion separation are suggestive evidences that the increase in corporate performance could arise as a result of strengthening the Board of Directors' monitoring capacity as different people assume the positions of CEO and COB. In this sense, we may infer that the benefits associated with this specific corporate governance practice may overcome eventual costs of its implementation to stakeholders at some level.

7 CONCLUSION

Using a unique quasi-experimental setting provided by a coercive regulation that abolished the possibility for a single individual to accumulate the titles of CEO and COB, we estimate the effect of CEO non-duality on corporate performance of publicly listed firms. Applying a differences-in-differences research design, we observe long-lasting positive effects on firms' value and weaker evidences on corporate profitability measures following the new leadership structure, contrasting prior research finding negative or no impacts arising from the separation of the two top leadership positions.

We find no indication that our findings for firms' value are driven by immediate market response to the announcement of the switch to non-duality. Also, management strategies related to investing and financing choices do not seem to explain the increase in performance, although we observe changes in corporate financing profile after the split of positions. The positive effect on performance persists regardless of whether companies adopt non-duality by changing the CEO (apprentice separation) or by changing the COB (demotion separation). However, stronger effects are detected for the latter possibility. This indicates the increase in performance does not come from changes in risk management strategies.

We do not discard other underlying mechanisms that lead to gains in performance, such as the composition of the Board or individual characteristics and compensations from CEO, COB, and Board members. Even though such factors may be relevant to understand our main results, we still obtain overall highly suggestive evidences of firms experiencing performance increase in response to a boost in firms' enforcement and oversight capacity that arises from the establishment of non-duality. Nevertheless, the evidence supports that benefits associated with this specific corporate governance practice may overcome eventual costs of its implementation to stakeholders in some dimension.

REFERENCES

- ADAMS, R. B.; HERMALIN, B. E.; WEISBACH, M. S. The role of boards of directors in corporate governance: A conceptual framework and survey. *Journal of Economic Literature*, v. 48, n. 1, p. 58–107, 2010.
- ADMATI, A. R. et al. The leverage ratchet effect. *The Journal of Finance*, v. 73, n. 1, p. 145–198, 2018.
- BALIGA, B. R.; MOYER, R. C.; RAO, R. S. CEO duality and firm performance: What's the fuss? *Strategic Management Journal*, v. 17, n. 1, p. 41–53, 1996.
- BORUSYAK, K.; JARAVEL, X. Revisiting event study designs. *Available at SSRN 2826228*, 2017.
- BOYD, B. K. CEO duality and firm performance: A contingency model. *Strategic Management Journal*, v. 16, n. 4, p. 301–312, 1995.
- BRICKLEY, J. A.; COLES, J. L.; JARRELL, G. Leadership structure: Separating the CEO and chairman of the board. *Journal of Corporate Finance*, v. 3, n. 3, p. 189–220, 1997.
- CHANG, K.; LEE, J.; SHIM, H. CEO duality and firm performance: Does economic policy uncertainty mediate the relation? *International Review of Finance*, v. 19, n. 4, p. 877–891, 2018.
- DAHYA, J.; GARCIA, L. G.; BOMMEL, J. V. One man two hats: What's all the commotion! *The Financial Review*, v. 44, n. 2, p. 179–212, 2009.
- DAHYA, J.; LONIE, A. A.; POWER, D. The case for separating the roles of chairman and CEO: An analysis of stock market and accounting data. *Corporate Governance: An International Review*, v. 4, n. 2, p. 71–77, 1996.
- DAHYA, J.; MCCONNELL, J. J. Board composition, corporate performance, and the Cadbury committee recommendation. *Journal of Financial and Quantitative Analysis*, v. 42, n. 3, p. 535–564, 2007.
- DAHYA, J.; TRAVLOS, N. Does the one man show pay? Theory and evidence on the dual CEO revisited. *European Financial Management*, v. 6, n. 1, p. 85–98, 2000.
- DALTON, D. R. et al. Meta-analytic reviews of board composition, leadership structure, and financial performance. *Strategic Management Journal*, v. 19, n. 3, p. 269–290, 1998.
- DALTON, D. R.; DALTON, C. M. *Integration of micro and macro studies in governance research: CEO duality, board composition, and financial performance*. [S.l.]: SAGE Publications Sage CA: Los Angeles, CA, 2011.
- DEY, A.; ENGEL, E.; LIU, X. CEO and board chair roles: To split or not to split? *Journal of Corporate Finance*, v. 17, n. 5, p. 1595–1618, 2011.
- DIAMOND, D. W.; HE, Z. A theory of debt maturity: the long and short of debt overhang. *The Journal of Finance*, v. 69, n. 2, p. 719–762, 2014.

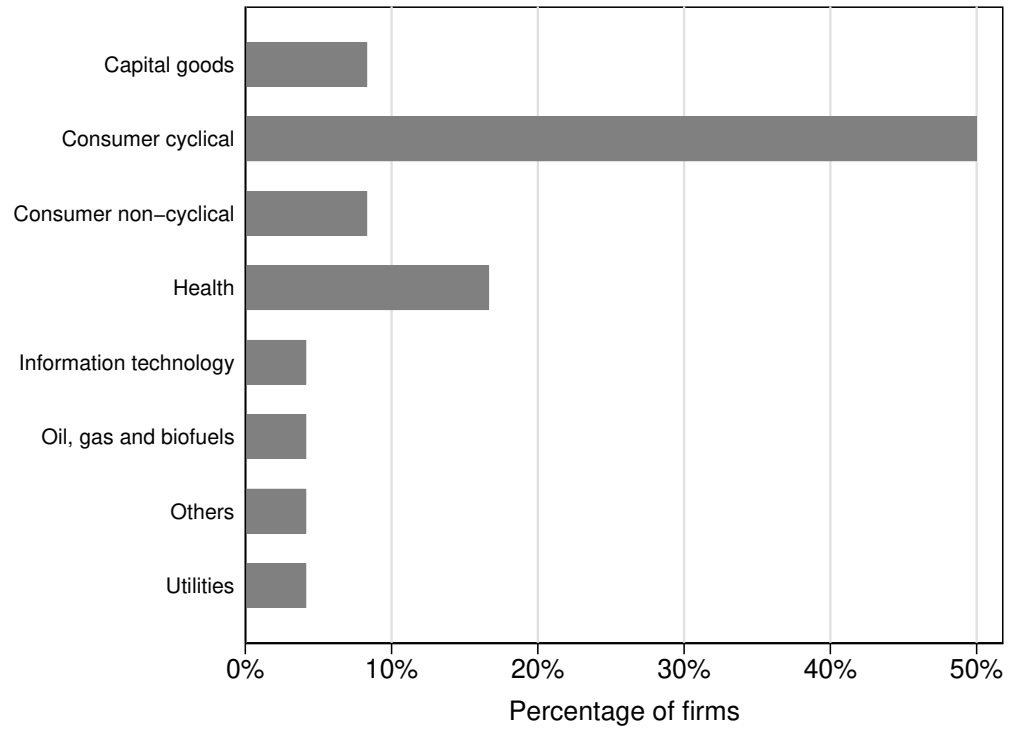
- DONALDSON, L.; DAVIS, J. H. Stewardship theory or agency theory: CEO governance and shareholder returns. *Australian Journal of Management*, v. 16, n. 1, p. 49–64, 1991.
- DURU, A.; IYENGAR, R. J.; ZAMPELLI, E. M. The dynamic relationship between CEO duality and firm performance: The moderating role of board independence. *Journal of Business Research*, v. 69, n. 10, p. 4269–4277, 2016.
- ELSAYED, K. Does CEO duality really affect corporate performance? *Corporate Governance: An International Review*, v. 15, n. 6, p. 1203–1214, 2007.
- FAMA, E. F.; JENSEN, M. C. Separation of ownership and control. *The Journal of Law and Economics*, v. 26, n. 2, p. 301–325, 1983.
- HARRIS, D.; HELFAT, C. E. CEO duality, succession, capabilities and agency theory: Commentary and research agenda. *Strategic Management Journal*, v. 19, n. 9, p. 901–904, 1998.
- HARRIS, M.; RAVIV, A. The theory of capital structure. *The Journal of Finance*, v. 46, n. 1, p. 297–355, 1991.
- HSU, S. et al. CEO duality, information costs, and firm performance. *The North American Journal of Economics and Finance*, p. 101011, 2019.
- IYENGAR, R. J.; ZAMPELLI, E. M. Self-selection, endogeneity, and the relationship between CEO duality and firm performance. *Strategic Management Journal*, v. 30, n. 10, p. 1092–1112, 2009.
- JENSEN, M. C. The modern industrial revolution, exit, and the failure of internal control systems. *The Journal of Finance*, v. 48, n. 3, p. 831–880, 1993.
- JENSEN, M. C.; MECKLING, W. H. Theory of the firm: managerial behavior, agency costs, and ownership structure. In: *Economics Social Institutions*. [S.l.: s.n.], 1979. p. 163–231.
- JENSEN, M. C.; MECKLING, W. H. Specific and general knowledge, and organizational structure. *Journal of Applied Corporate Finance*, v. 8, n. 2, p. 4–18, 1995.
- KRAUSE, R.; SEMADENI, M. Apprentice, departure, and demotion: An examination of the three types of CEO–board chair separation. *Academy of Management Journal*, v. 56, n. 3, p. 805–826, 2013.
- KRAUSE, R.; SEMADENI, M.; CANNELLA JUNIOR, A. A. CEO duality: A review and research agenda. *Journal of Management*, v. 40, n. 1, p. 256–286, 2014.
- LARCKER, D. F.; ORMAZABAL, G.; TAYLOR, D. J. The market reaction to corporate governance regulation. *Journal of Financial Economics*, v. 101, n. 2, p. 431–448, 2011.
- LARCKER, D. F.; TAYAN, B. Chairman and CEO: the controversy over board leadership structure. *Rock Center for Corporate Governance at Stanford University Closer Look Series: Topics, Issues and Controversies in Corporate Governance No. CGRP-58*, p. 16–32, 2016.
- LEMMON, M. L.; ZENDER, J. F. Debt capacity and tests of capital structure theories. *Journal of Financial and Quantitative Analysis*, p. 1161–1187, 2010.

- LEW, Y. K.; YU, J.; PARK, J.-Y. The impacts of independent director and CEO duality on performance in the chinese post-institutional-transition era. *Canadian Journal of Administrative Sciences*, v. 35, n. 4, p. 620–634, 2018.
- MYERS, S. C. Determinants of corporate borrowing. *Journal of Financial Economics*, v. 5, n. 2, p. 147–175, 1977.
- OPLER, T. et al. Corporate cash holdings. *Journal of Applied Corporate Finance*, v. 14, n. 1, p. 55–67, 2001.
- PALMON, O.; WALD, J. K. Are two heads better than one? The impact of changes in management structure on performance by firm size. *Journal of Corporate Finance*, v. 8, n. 3, p. 213–226, 2002.
- RECHNER, P. L.; DALTON, D. R. CEO duality and organizational performance: A longitudinal analysis. *Strategic Management Journal*, v. 12, n. 2, p. 155–160, 1991.
- RHOADES, D. L.; RECHNER, P. L.; SUNDARAMURTHY, C. A meta-analysis of board leadership structure and financial performance: Are “two heads better than one”? *Corporate Governance: An International Review*, v. 9, n. 4, p. 311–319, 2001.
- ROWE, W. G.; MORROW JUNIOR, J. L. A note on the dimensionality of the firm financial performance construct using accounting, market, and subjective measures. *Canadian Journal of Administrative Sciences*, v. 16, n. 1, p. 58–71, 1999.
- VENKATRAMAN, N.; RAMANUJAM, V. Measurement of business performance in strategy research: A comparison of approaches. *Academy of Management Review*, v. 11, n. 4, p. 801–814, 1986.
- YANG, T.; ZHAO, S. CEO duality and firm performance: Evidence from an exogenous shock to the competitive environment. *Journal of Banking & Finance*, v. 49, p. 534–552, 2014.

APPENDICES

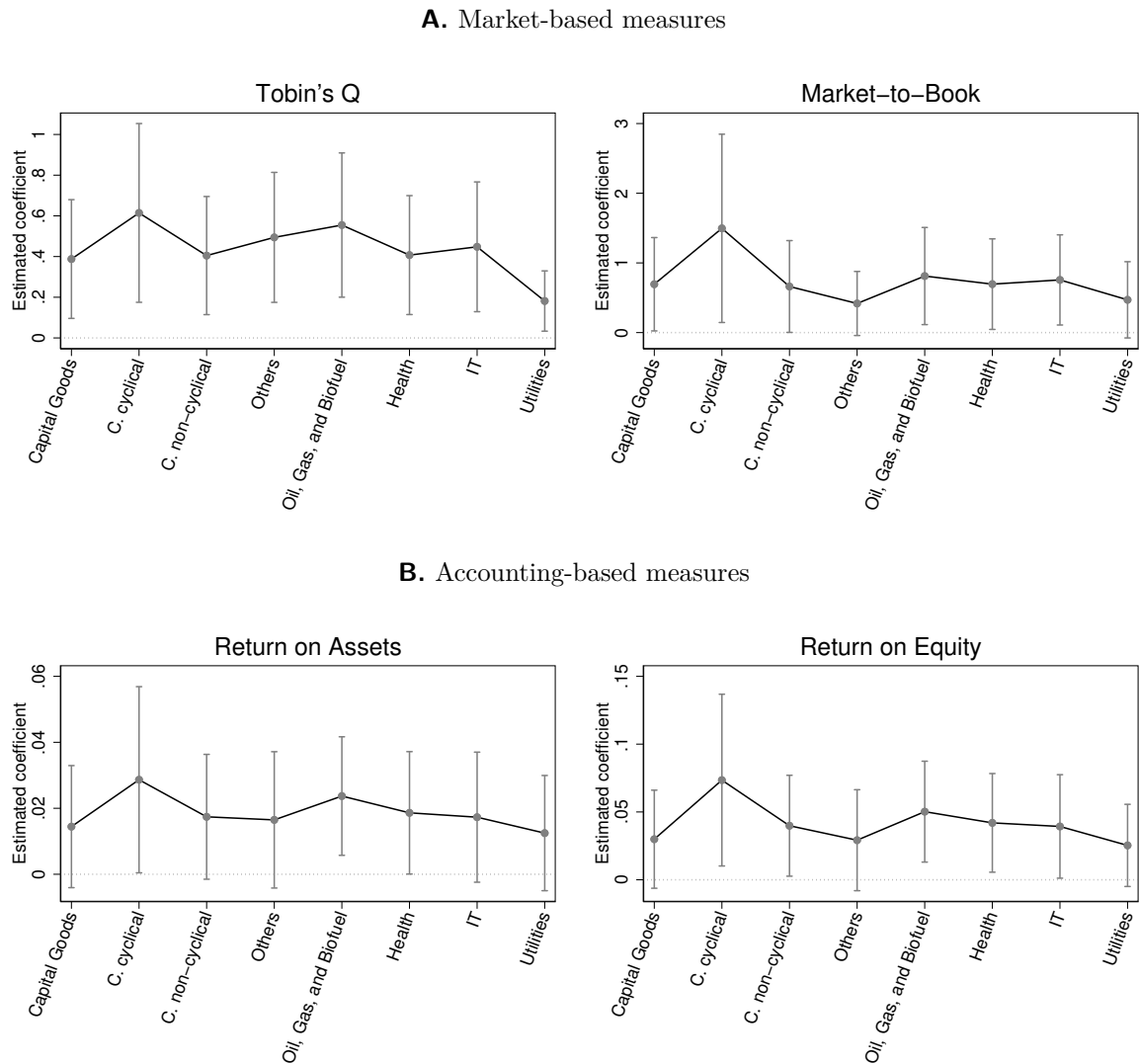
APPENDIX A – FIGURES

Figure A.1. Sample distribution by industry

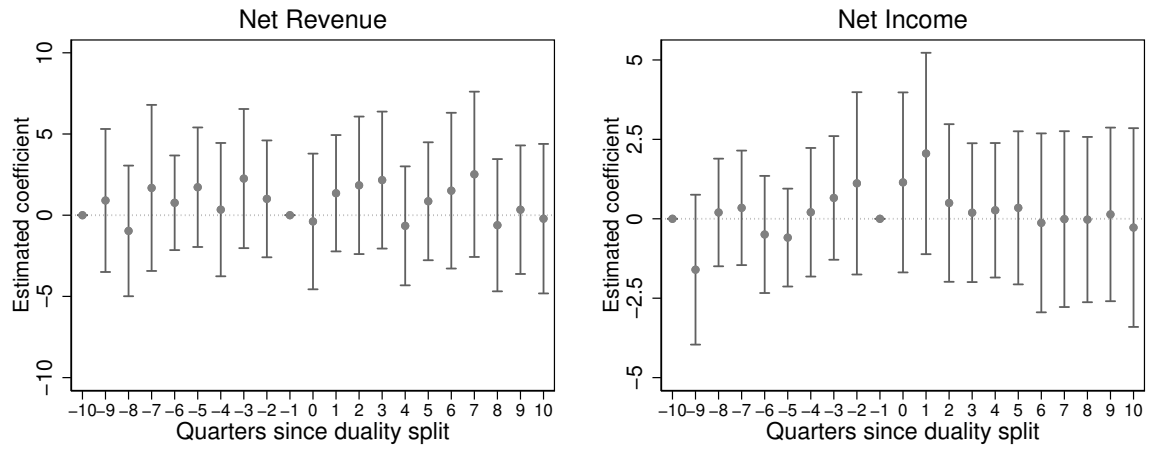


Notes: This figure presents the distribution of firms in our sample by industry.

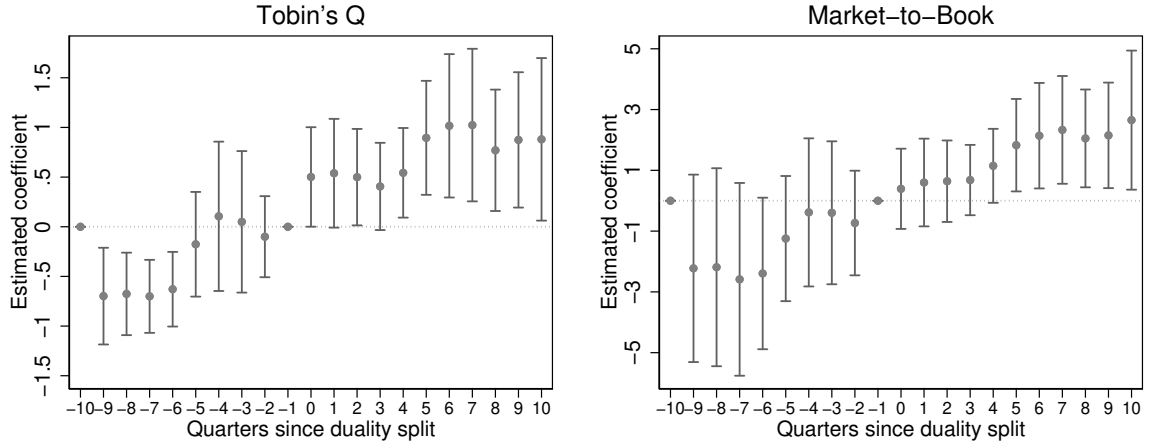
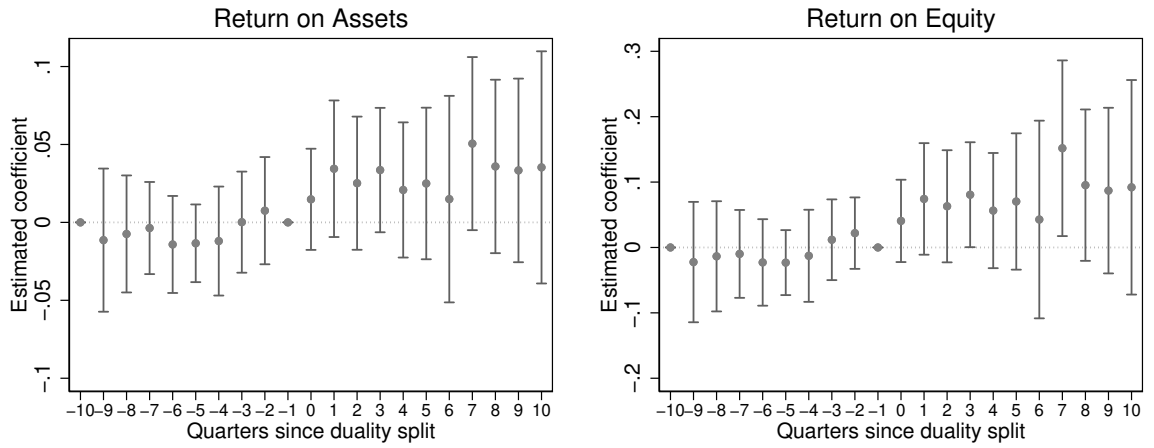
Figure A.2. Impacts of CEO Non-Duality on Corporate Performance — Exclusion of one industry at each estimation



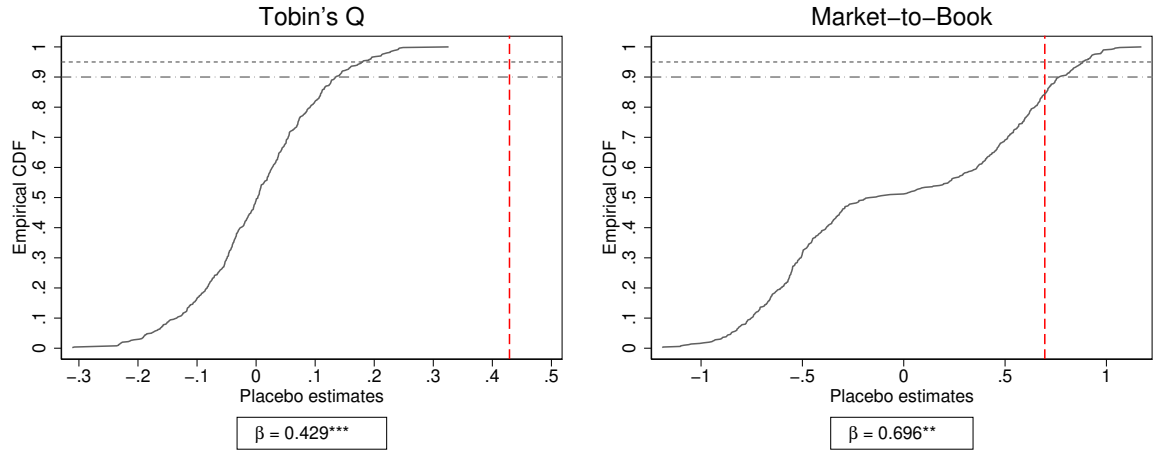
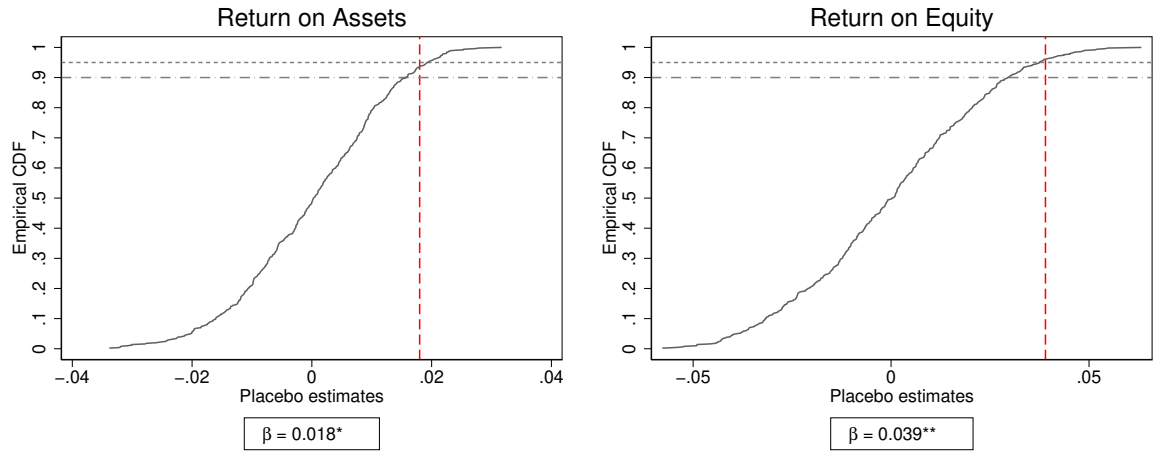
Notes: This figure presents the average impact of the change in leadership structure on market- and accounting-based measures of corporate performance. Each graphic plots the estimated coefficients β obtained from equation 1, and each of such coefficients refers to a regression without the firms of one industry of our sample. The vertical lines represent confidence intervals at 95% levels. All specifications include firm and quarter-year fixed-effects, and assets control. Coefficients are estimated with robust standard errors to heteroskedasticity.

Figure A.3. Impacts of CEO Non-Duality on Net Revenues and on Net Income

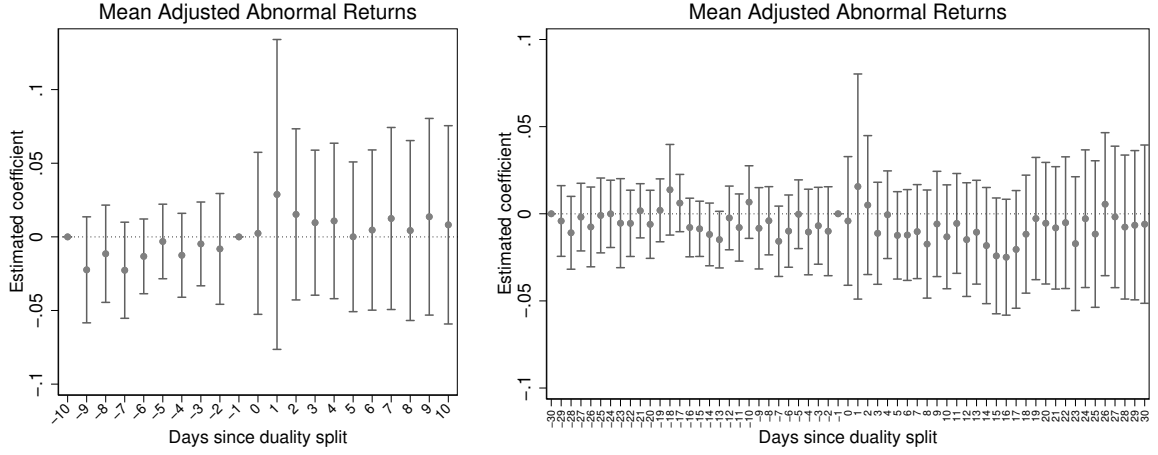
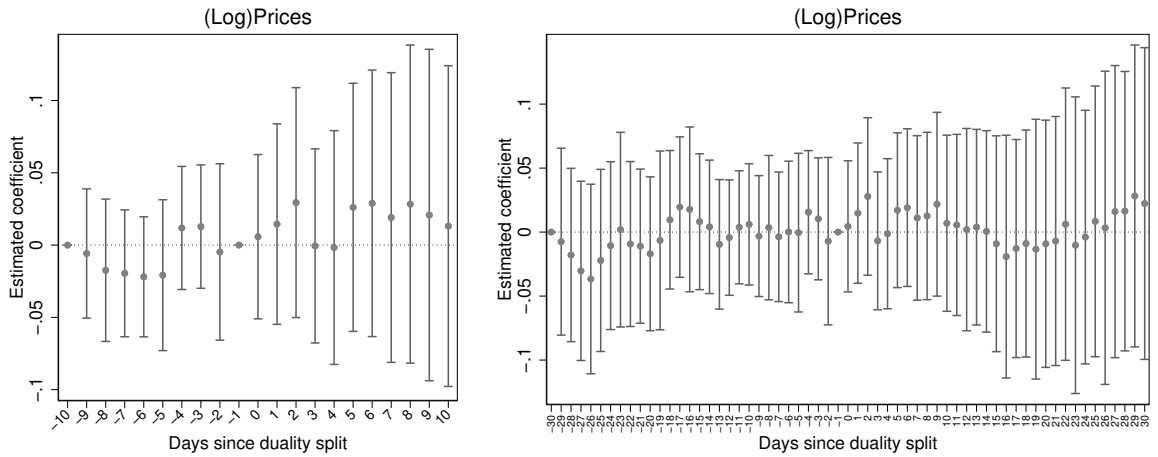
Notes: This figure presents the average impact of the change in leadership structure on Net Revenues and on Net Income. Each graphic plots the estimated coefficients β obtained from equation 1, and each of such coefficients refers to a regression without the firms of one industry of our sample. The vertical lines represent confidence intervals at 95% levels. All specifications include firm and quarter-year fixed-effects, and assets control. Coefficients are estimated with robust standard errors to heteroskedasticity.

Figure A.4. Impacts of CEO Non-Duality on Corporate Performance — Excluding Complier in 2015**A. Market-based measures****B. Market-based measures**

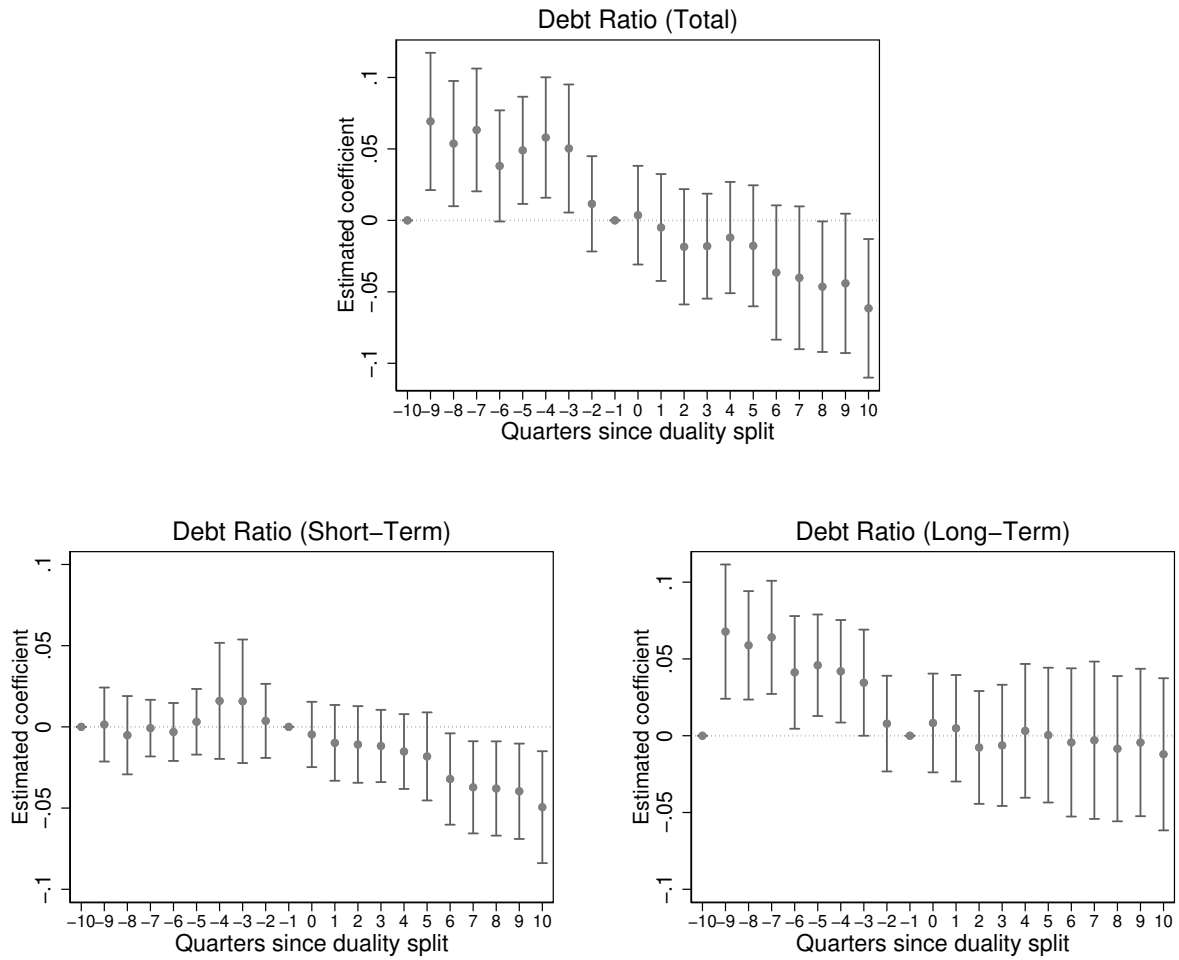
Notes: This figure presents the average impact of the change in leadership structure on market- and accounting-based measures of corporate performance, with sample adjusted by the exclusion of the complier firm in 2015. Each graphic plots the estimated coefficients β obtained from equation 1, and each of such coefficients refers to a regression without the firms of one industry of our sample. The vertical lines represent confidence intervals at 95% levels. All specifications include firm and quarter-year fixed-effects, and assets control. Coefficients are estimated with robust standard errors to heteroskedasticity.

Figure A.5. Permutation Test**A. Market-based measures****B. Accounting-based measures**

Notes: This figure shows the distributions of estimates from placebo permutation tests of our main specification. We randomly generated false dates for firms switching to non-duality, and then estimated Equation 1 as if the false dates were the correct ones. We run this estimation 500 times. Each graphic plots the distribution of placebo estimates of β , which would be the impact of non-duality on corporate performance. The vertical line represent the real estimates, as presented in Table 2.

Figure A.6. Impacts of CEO Non-Duality on Market outcomes — Alternative Windows Around Announcement**A. Mean Adjusted Abnormal Returns****B. (Log)Prices**

Notes: This figure presents the dynamic impact of the change in leadership structure on stock prices and abnormal returns, with alternative windows around the announcement date of change. Each graphic plots the estimated coefficients $\beta_{pre,m}$ and $\beta_{post,n}$ obtained from equation 2. The vertical lines represent confidence intervals at 95% levels. All specifications include firm and day fixed-effects. Coefficients are estimated with robust standard errors to heteroskedasticity.

Figure A.7. Impacts of CEO Non-Duality on Debt Ratios

Notes: This figure presents the dynamic impact of the change in leadership structure on debt ratios. Each graphic plots the estimated coefficients $\beta_{pre,m}$ and $\beta_{post,n}$ obtained from equation 2. The vertical lines represent confidence intervals at 95% levels. All specifications include firm and quarter-year fixed-effects, and assets control. Coefficients are estimated with robust standard errors to heteroskedasticity.

APPENDIX B – TABLES

Table B.1. Sample Definition

	<i>N. of Firms</i>
Listed in B3's special segments:	
Corporate Governance Level 1	24
Corporate Governance Level 2	13
New Market	<u>111</u>
	148
(-) Financial firms:	
Corporate Governance Level 1	5
Corporate Governance Level 2	4
New Market	<u>7</u>
	16
(-) Firms with CEO Non-Duality structure (2011-2015):	
Corporate Governance Level 1	19
Corporate Governance Level 2	6
New Market	<u>78</u>
	103
(-) Firms with negative equity:	
Corporate Governance Level 1	0
Corporate Governance Level 2	1
New Market	<u>3</u>
	4
(-) Firms in pre-operational stage:	
Corporate Governance Level 1	0
Corporate Governance Level 2	0
New Market	<u>1</u>
	1
Sample of firms:	
Corporate Governance Level 1	0
Corporate Governance Level 2	2
New Market	<u>22</u>
<i>Total of firms in the sample</i>	24

Notes. This table shows the number of firms and stocks with which we conducted our research.

Table B.2. Variables Description

<i>Panel A. Corporate performance outcomes (quarterly data)</i>			
<i>Market-based measures:</i>			
Tobin's Q			Book value of total assets minus book value of equity plus market value of equity, divided by book value of total assets.
Market-to-Book			Market value of equity, divided by book value of equity.
<i>Accounting-based measures:</i>			
Return on Assets			Earnings before extraordinary items, divided by book value of total assets.
Return on Equity			Earnings before extraordinary items, divided by book value of equity.
<i>Panel B. Additional stock-level outcomes (daily data)</i>			
Mean Adjusted Abnormal Re-			Difference between the daily stock return and the average of the stock returns over the estimation period. We consider the maximum period of trading days available for each stock as estimation period.
turns			
(Log)Prices			(Log)Closing prices for a given stock.
<i>Panel C. Additional firm-level outcomes (quarterly data)</i>			
<i>Investing activities:</i>			
Corporate Investment			Capital expenditures, divided by book value of total assets in the previous quarter.
Fixed-Assets Ratio			Property, plant and equipment, divided by book value of total assets.
<i>Financing activities:</i>			
Leverage Ratio			
Book Leverage			Book value of total debt, divided by book value of total debt plus book value of equity.
Market Leverage			Book value of total debt, divided by book value of total debt plus market value of equity.
Debt Ratio			
Total			Book value of total debt, divided by book value of total assets.
Short-Term			Book value of short-term debt, divided by book value of total assets.
Long-Term			Book value of long-term debt, divided by book value of total assets.

Notes. This table presents the definition of corporate performance measures (Panel A); and a set of additional stock- and firm-level outcomes we use to investigate mechanisms (Panels B and C, respectively).

Table B.3. Identification of Firms in the Sample

ID	Firm	Special Listing Segment	Type of Separation
1	Aliansce Shopping Centers S.A.	New Market	Demotion
2	Arezzo Indústria e Comércio S.A.	New Market	Apprentice
3	Cosan S.A.	New Market	Apprentice
4	CSU CardSystem S.A.	New Market	Demotion
5	Cyrela Brazil Realty S.A. Empreendimentos e Participações	New Market	Apprentice
6	Direcional Engenharia S.A.	New Market	Demotion
7	Even Construtora e Incorporadora S.A.	New Market	Departure
8	Helbor Empreendimentos S.A.	New Market	Apprentice
9	JHSF Participações S.A.	New Market	Apprentice
10	JSL S.A.	New Market	Apprentice
11	Localiza Rent a Car S.A.	New Market	Apprentice
12	Lojas Marisa S.A.	New Market	Demotion
13	LPS Brasil - Consultoria de Imóveis S.A.	New Market	Demotion
14	M. Dias Branco S.A. Indústria e Comércio de Alimentos	New Market	Apprentice
15	MRV Engenharia e Participações S.A.	New Market	Apprentice
16	Marfrig Global Foods S.A.	New Market	Apprentice
17	Multiplan - Empreendimentos Imobiliários S.A.	Corporate Governance Level 2	Demotion
18	Profarma Distribuidora de Produtos Farmacêuticos S.A.	New Market	Demotion
19	Renova Energia S.A.	Corporate Governance Level 2	Apprentice
20	São Carlos Empreendimentos e Participações S.A.	New Market	Apprentice
21	Springs Global Participações S.A.	New Market	Demotion
22	Tecnisa S.A.	New Market	Demotion
23	Time for Fun Entretenimento S.A.	New Market	Demotion
24	Totvs S.A.	New Market	Demotion

Notes. This table lists the firms of our sample, the special segment in which they are listed, and the type of separation.

Table B.4. Impact of CEO Non-Duality on Corporate Performance — Excluding Complier in 2015

	Dependent variable			
	Tobin's Q (1)	Market-to-Book (2)	Return on Assets (3)	Return on Equity (4)
Non-Duality	0.521*** (0.168)	0.930** (0.384)	0.024** (0.011)	0.051** (0.021)
N. of observations	724	724	733	733
R^2	0.803	0.269	0.450	0.289
Firm FE	Yes	Yes	Yes	Yes
Quarter-Year FE	Yes	Yes	Yes	Yes
Assets control	Yes	Yes	Yes	Yes

Notes. Robust standard errors are in parentheses. ***, * and * indicate significance at 1, 5 and 10 percent levels, respectively.

Table B.5. Impact of CEO Non-Duality on Corporate Performance — Wild Bootstrap SE

	Tobin's Q		Market-to-Book		Return on Assets		Return on Equity	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Non-Duality	0.429 (0.130)	0.429 (0.003)	0.696 (0.046)	0.696 (0.021)	0.018 (0.145)	0.018 (0.051)	0.039 (0.113)	0.039 (0.022)
N. of observations	756	756	756	756	765	765	765	765
R^2	0.805	0.805	0.272	0.272	0.456	0.456	0.292	0.292
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Assets control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm cluster	Yes	No	Yes	No	Yes	No	Yes	No
Replicates	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000

Notes. p-values are in parentheses.

Table B.6. Impact of CEO Non-Duality on Corporate Performance — Financing Activities Controls

	Tobin's Q			Market-to-Book			Return on Assets			Return on Equity		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Non-Duality	0.453*** (0.289)	0.465*** (0.287)	0.402*** (0.275)	0.765** (0.309)	0.903*** (0.319)	0.718** (0.347)	0.015 (0.009)	0.015 (0.009)	0.017* (0.009)	0.037** (0.018)	0.042** (0.018)	0.042** (0.019)
N. of observations	756	756	756	756	756	756	765	765	756	765	765	756
R ²	0.806	0.807	0.807	0.272	0.276	0.272	0.459	0.461	0.480	0.292	0.292	0.298
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Assets control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Debt Ratio (Total)	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No	No
Book Leverage	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No
Market Leverage	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes

Notes. Robust standard errors are in parentheses. ***, * and * indicate significance at 1, 5 and 10 percent levels, respectively.