

Does CEO Non-Duality Affect Earnings Management? Evidence from Brazil*

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Abstract

We exploit a governance regulation enacted in Brazil to provide evidence on whether CEO non-duality influences earnings management. The natural experiment allows us to compare firms mandated to terminate CEO-chairman accumulation of positions with pre-mandate non-duality firms in a staggered difference-in-differences design. Employing recent developments in the methodology, our results show that treated firms reduced their discretionary accruals while keeping real activities unchanged, suggesting an improvement in financial reporting quality. Effects are concentrated in larger firms and those exhibiting higher ex ante levels of discretionary accruals. Our findings are policy-relevant as they underscore that a coercive CEO-chairman separation may emerge as a key mechanism in corporate governance, capable of mitigating agency conflicts by curbing CEO opportunistic behavior associated with earnings manipulation.

JEL codes: G32, G34, G38, M40.

Keywords: Earnings management, CEO duality, corporate governance reform.

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1 Introduction

Whether CEO duality fosters earnings management practices is an understudied topic in corporate governance (Krause et al., 2014), yet it holds particular interest due to its potential to shape investors' behavior and, ultimately, influence firm performance. The theoretical issue lies in the potential agency conflicts arising from the CEO power concentration, which may weaken board's independence and monitoring function while enabling managerial opportunistic behavior (Jensen, 1993). Therefore, dual-CEOs may use accounting strategies to create the impression of enhanced performance in disclosed financial statements, blurring shareholders' ability to make optimal investment decisions. Empirical studies document mixed evidence regarding the correlation between the two dimensions, indicating either a positive relationship (Davidson et al., 2004; Lo et al., 2010a) or a lack of association (Wruck and Wu, 2021). However, identifying a causal link is challenging because the decision to accumulate or terminate CEO-chairman positions is endogenous to agents' governance preferences and other firm's unobservable characteristics. This paper aims to fill this gap by searching for earnings management activities in plausible exogenous CEO duality ruptures triggered by the passage of a mandatory governance reform in the Brazilian stock market.

Earnings manipulation is widely viewed as a controversial accounting practice and empirically investigated in the corporate governance literature. Evidence suggests that firms with more independent and specialized boards have lower incidences of earnings management (Cornett et al., 2009; Lo et al., 2010b), as do those presenting higher board meeting frequency and audit committees composed of members with corporate experience (Xie et al., 2003). Institutional monitoring, proxied by the presence of large institutional investors in the company's capital, also tends to mitigate earnings manipulation (Chung et al., 2002).

The role of CEO duality on firms outcomes is a largely researched topic, albeit hindered by endogeneity problems (Adams et al., 2010). Current literature points to context-dependent effects of related governance reforms on stock market reaction and firm value (Larcker et al., 2011; Fauver et al., 2017; Chang et al., 2019; Guimarães and Trevisan, 2022), firm survival (Byrd et al., 2012), and internal capital allocation (Aktas et al., 2019). To our best knowledge, no prior study has tackled the association between CEO duality and earnings management with causal claims. We argue that the rupture in CEO-chairman positions leads to lower levels of

earnings management because this governance arrangement is expected to restrain managerial opportunism, thereby alleviating agency issues and improving the quality of reported accounting information. To expand our understanding about the overall effect of such practice, our approach focuses on both real activities and accrual-based measures ([Fields et al., 2001](#)).

Our robust results show that separating CEO-chairman titles significantly deters earnings management activities, with heterogeneous effects observed across different types of firms. Furthermore, our findings carry important policy implications for the ongoing debate surrounding separate leadership structure as a governance mechanism.

2 Institutional Setting

On May 10th, 2011, the Brazilian Stock Exchange (B3) enacted a regulation aiming to improve corporate governance standards among publicly listed firms. The reform was prompted by many corporate scandals worldwide in the 1990s, also representing B3's commitment to follow good governance practices adopted internationally in several financial markets. Specifically, the regulation applies only to firms listed in special listing segments — New Market (NM), Governance L2 (L2) and Governance L1 (L1) —, which require firms to meet distinguished governance and accountability levels compared to regular listing. It is worth noting that the Brazilian stock market is characterized by high ownership concentration and an overall lower quality of investor protection institutions ([Martins et al., 2021](#)), compared to more developed markets.

Unlike most codes that recommend firms to follow certain governance practices such as the Sarbanes-Oxley (SOX) Act in U.S. and the Cadbury Committee Report in U.K., the B3's reform called for a mandatory and immediate compliance to all new implemented directives. The guidelines included the revision of contractual texts, changes in minimum requirements for trading shares, new sanctions and prohibitions, and, importantly to our context, the prohibition to accumulate CEO and chairman titles to a single person. Companies that had a dual-CEO structure prior to the implementation of the rule were given a three-year deadline to comply, a fact that is crucial to consider in our identification strategy. At the time, 28 non-financial companies listed in the NM and L2 segments had a unified leadership structure, representing 25% of all

firms in the two listing segments.¹ Due to the cautious monitoring made by B3 along the years, all duality firms ended up complying with the regulation. Firms use the minutes of their assemblies as their means of publicizing any governance changes.

Since the reform's terms affect listed firms equally in all dimensions except for their baseline leadership condition, we argue that the coercive rule serve as a natural experiment that controls for firms' governance preferences, allowing us to estimate the impacts of separating CEO-chairman positions.

3 Data and Research Design

Financial data is obtained from Economatica, a private company that provides data intelligence services in the financial area. The data is available in a quarterly fashion. Information on firms' leadership structure and operating sector is retrieved from B3's website, while characteristics such as year of foundation and other governance provisions are sourced from the Brazilian Securities and Exchange Commission's website. Our sample excludes financial firms and those listed in the L1 segment, encompassing a total of 4,026 firm-quarter observations for the period 2008–2017.

To estimate our accrual-based variable, we use a version of the models proposed by [Kothari et al. \(2005\)](#) and [Kim et al. \(2017\)](#), which are based on [Jones \(1991\)](#)'s original model, using firm- (i) and calendar quarter-level (t) data:

$$\frac{TAccruals_{i,t}}{Assets_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{Assets_{i,t-1}} + \beta_2 \frac{\Delta Revenues_{i,t}}{Assets_{i,t-1}} + \beta_3 \frac{PPE_{i,t}}{Assets_{i,t-1}} + \beta_4 ROA_{i,t-1} + \theta_t + \theta_s + \epsilon_{i,t}, \quad (1)$$

where $TAccruals_{i,t}$ represents net income minus operating cash flows, $Assets_{i,t-1}$ denotes lagged total assets, $\Delta Revenues_{i,t}$ stands for changes in net revenues from quarter $t - 1$ to t , $PPE_{i,t}$ comprises property, plant, and equipment, and $ROA_{i,t-1}$ measures lagged return on assets. The specification includes time (θ_t) and industry (θ_s) fixed effects. To proxy for earnings management, we utilize the absolute value of the predicted errors ($\hat{\epsilon}_{i,t}$). The variable is winsorized at the 2% level to eliminate extreme values.

¹No companies had dual-CEO in the L1 listing segment.

Our approach to measure earnings management through manipulation of real activities is based on Roychowdhury (2006) and Zang (2012), where we first obtain the residuals (abnormal level of production costs) from the regression:

$$\frac{COGS_{i,t}}{Assets_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{Assets_{i,t-1}} + \beta_2 \frac{Revenues_{i,t}}{Assets_{i,t-1}} + \beta_3 \frac{\Delta Revenues_{i,t}}{Assets_{i,t-1}} + \beta_4 \frac{\Delta Revenues_{i,t-1}}{Assets_{i,t-1}} + \theta_t + \theta_s + u_{i,t}, \quad (2)$$

where $COGS_{i,t}$ represents the cost of goods sold. Next, we estimate the residuals (abnormal level of discretionary expenses) from the following model:

$$\frac{Expenditures_{i,t}}{Assets_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{Assets_{i,t-1}} + \beta_2 \frac{Revenues_{i,t-1}}{Assets_{i,t-1}} + \theta_t + \theta_s + \eta_{i,t}, \quad (3)$$

where $Expenditures_{i,t}$ stands for the sum of current sale and administrative expenses. Finally, our proxy for real earnings manipulation is taken by the sum of residuals from Equations 4 and 5, $\hat{u}_{i,t} + (-1) \cdot \hat{\eta}_{i,t}$.

To identify the causal impacts of the CEO duality splits, we leverage the fact that firms presenting duality structure prior to the regulation were mandated to separate CEO-chairman roles (treatment group), while other rule-targeted companies were required to maintain their pre-mandate non-dual leadership structure (control group). Table 1 reports summary statistics for control and treated firms in our sample, underscoring their differences across several dimensions and indicating a mixture of both causal and selection effects. We address endogeneity concerns and assess the treatment effect of interest by estimating the following DD specification:

$$Y_{i,t} = \beta_1 Duality-rupture_{i,t} + \theta_i + \theta_{st} + u_{i,t}, \quad (4)$$

where $Y_{i,t}$ represents an earnings management outcome and $Duality-rupture_{i,t}$ is a dummy variable assuming value “1” from the quarters after the split of CEO-chairman positions. Since treated firms complied at different moments within the three-year deadline prescribed by the regulation, our setting constitutes a staggered roll-out design. The terms θ_i and θ_{st} are, respectively, firm and industry-time fixed effects to control for unobserved heterogeneity of firms and sectors over time that may affect the timing of compliance. In alternative models, we control for time-constant variables interacted with linear time trends and other

covariates. β_1 is the parameter of interest, measuring the average change in outcomes of treated firms after the transition to a CEO non-dual structure relative to the control group. The identifying assumption is that outcomes of treated and control firms evolve in parallel trends in the absence of treatment.

	Control group						Treatment group					
	Mean	s.d.	p25	p50	p75	Obs.	Mean	s.d.	p25	p50	p75	Obs.
<i>Panel A: Variables</i>												
Discretionary accruals	0.367	0.479	0.080	0.205	0.454	3,012	0.375	0.502	0.071	0.210	0.468	1,014
Real earnings	-0.007	0.140	-0.040	0.016	0.061	3,007	0.021	0.131	-0.021	0.032	0.070	1,013
Total assets	21.9	1.161	21.0	21.9	22.6	3,012	21.7	1.129	21.2	21.7	22.5	1,014
Market value	21.3	1.555	20.3	21.4	22.5	3,012	21.3	1.323	20.4	21.4	22.3	1,014
Return on assets	0.034	0.102	0.007	0.036	0.075	3,012	0.029	0.107	0.008	0.036	0.076	1,014
Market leverage	0.416	0.279	0.207	0.401	0.571	3,012	0.425	0.257	0.260	0.397	0.544	1,014
N. of family members	0.077	0.267	0	0	0	2,518	0.432	0.496	0	0	1	873
<i>Panel B: Firm characteristics</i>												
	Mean					Obs.	Mean					Obs.
Year of foundation	1984					3,012	1987					1,014
Favorable to separation	0.659					3,012	0.334					1,014
Listing segment												
New market	0.895					3,012	0.935					1,014
Governance L2	0.105					3,012	0.065					1,014
<i>Panel C: Industry</i>												
	Mean					Obs.	Mean					Obs.
Capital goods	0.232					3,012	0.068					1,014
Consumer goods (cyc.)	0.251					3,012	0.428					1,014
Consumer goods (non-cyc.)	0.124					3,012	0.077					1,014
Basic materials	0.062					3,012	0					1,014
Oil, gas, and biofuels	0.010					3,012	0.141					1,014
Health	0.062					3,012	0.077					1,014
IT and communication	0.023					3,012	0.038					1,014
Public utilities	0.142					3,012	0.029					1,014
Others	0.094					3,012	0.142					1,014

Table 1: Descriptive Statistics

This table reports descriptive statistics segregated by firms with separate titles prior to regulation (control group) and duality firms that will eventually split positions (treatment group). The sample comprises 82 control firms and 28 treated firms.

Recent contributions to the difference-in-differences literature highlight the role of weighting procedures in biasing the estimates, stemming from the heterogeneity in treatment effects and the timing of events. In our case, having a never-treated group of firms partially attenuates the problems yielding from the negative weights. To address the underlying issues in staggered adoption designs, we employ the efficient imputation estimator proposed by [Borusyak et al. \(2024\)](#) (BJS, henceforth) as our baseline approach. Heteroskedasticity-

robust standard errors are calculated with a firm-level cluster. Table A1 in the Appendix describes all variables used in the study.

4 Results

4.1 Main DD Estimates

Figure 1 reports Goodman-Bacon (2021)'s decomposition results for discretionary accruals and real earnings. The graphs indicate certain units exert considerable influence on the weighting of treatment effects, potentially impacting the magnitude of estimates when employing a conventional DD approach — depicted by the black horizontal lines.

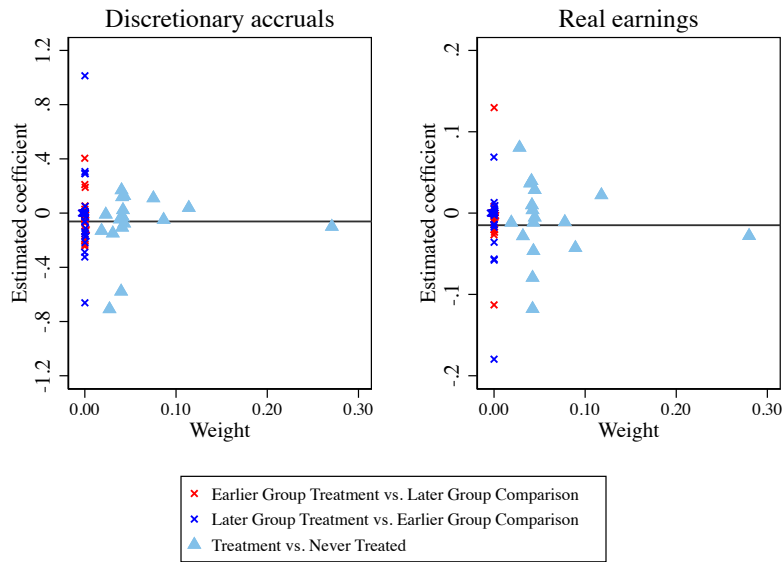


Figure 1: Goodman-Bacon Decomposition

This figure plots two-way DD components obtained from the decomposition theorem of Goodman-Bacon (2021), highlighting the DD single-coefficient estimate and total weight on each type of comparison.

Table 2 shows our main results derived from Equation 4. For comparison purposes, we contrast the conventional OLS estimates (column 1) with our baseline estimates (column 2) obtained by the BJS estimation method. The former appear to be severely downward (upward) biased in the case of discretionary accruals

(real earnings), thus confirming the issue embedded in the patterns outlined in Figure 1. The DD estimates presented in column 2 of Panel A indicate that firms switching to CEO non-duality, relative to the control group, significantly decrease earnings management through accruals. We do not find evidence that treated firms respond to the governance provision by manipulating real activities (Panel B, column 2).

	OLS (1)	BJs (2)	BJs (3)	BJs (4)	BJs (5)	BJs (6)	BJs (7)	BJs/PSM (8)	CS (9)
<i>Panel A: Discretionary accruals</i>									
Duality-rupture _{it}	-0.023 (0.468)	-0.089*** (0.005)	-0.091*** (0.008)	-0.090*** (0.005)	-0.083*** (0.005)	-0.089*** (0.003)	-0.090*** (0.008)	-0.112* (0.070)	-0.157** (0.013)
Observations	4,026	4,026	4,026	4,026	4,026	3,391	3,458	1,501	4,024
<i>Panel B: Real earnings</i>									
Duality-rupture _{it}	-0.018 (0.139)	-0.006 (0.548)	-0.003 (0.800)	-0.008 (0.457)	0.007 (0.542)	0.011 (0.319)	-0.001 (0.893)	-0.020 (0.284)	0.018 (0.300)
Observations	4,020	4,020	4,020	4,020	4,020	3,390	3,452	1,499	4,018
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-time FE	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
N. of control/treated firms	82 / 28	82 / 28	82 / 28	82 / 28	82 / 28	82 / 28	68 / 26	23 / 23	82 / 28
Time FE	No	No	Yes	No	No	No	No	No	No
Industry-year FE	No	No	Yes	No	No	No	No	No	No
Covariates									
Pre-determined characteristics	No	No	No	Yes	Yes	Yes	No	Yes	No
Financial variables	No	No	No	No	Yes	Yes	No	No	No
N. of family members	No	No	No	No	No	Yes	No	No	No
Excluding segment and sector	No	No	No	No	No	No	Yes	No	No

Table 2: Impacts of CEO Non-Duality on Earnings Management

This table presents results of difference-in-differences regressions, obtained from OLS (Column 1) and the estimation method of [Borusyak et al. \(2024\)](#) (Columns 2–8). Covariates include: a) listing segment and year of foundation, interacted with a linear time trend; b) financial variables, including total assets, market value, return on assets, and market leverage; and c) number of family members. Column (7) excludes firms in Governance L2 listing segment and those operating in basic materials sector. ***, **, * represent statistical significance at the 1%, 5% and 10% levels, respectively.

We provide various alternative analyses. As shown in column (3), estimates are not sensitive to the inclusion of time fixed effect and the interaction between industry and year fixed effects, alternatively to industry-time fixed effects in the main model. Column (4) shows coefficients are unchanged and still precisely estimated when controlling for firm’s pre-determined characteristics. The exercises in columns (5) and (6) test estimates’ sensitiveness for the inclusion of financial characteristics and the number of family members in the board. The rationale is the treatment event may shape these firm’s dimensions and, as a result, affect their earnings management strategies. For instance, as a consequence of the rupture in CEO-chairman roles,

firms could expand in size and value or even cut familiar links in the board to reduce potential conflicts, which in turns may change the way companies report their earnings. Controlling for these variables barely changes the coefficients, strongly suggesting they are not channels of our findings² and that the effects in earnings management are driven by the disruption in CEO power entrenchment.

Next, we provide two checks using different samples. Since there are few firms in Governance L2 segment and none treated firm operating in basic materials sector, we test robustness by excluding these observations in column (7). We obtain precise and robust estimates. In column (8), we use a one-to-one matched pairs obtained by a propensity score matching procedure. Although the loss of precision, the results remain robust.

Finally, in column (9) we check robustness by implementing the DD estimator developed by [Callaway and Sant’Anna \(2021\)](#), which is robust to heterogeneity in treatment effects and the timing of events as well. The effect on discretionary accruals is larger in size and statistically significant, which suggests we could be underestimating the impact in our baseline approach. The estimates of the effects on real earnings management do not exhibit statistical significance in any of our tests, as shown across all columns of Table 2.

4.2 Evaluating Pre-trends

Our single-coefficient DD results strongly suggest that firms reduce the use of discretionary accruals to manage their earnings. However, this result could be endogenous to other trends in firm behavior, thus violating the parallel trends assumption. To provide reliability of our identification strategy, we expand our model in an event study regression design (distributed-lag model) to indirectly check the presence of pre-trends in the outcome:

$$Y_{i,t} = \sum_{k \leq -2} \beta_k Leads_{i,k} + \sum_{k \geq 0} \beta_k Lags_{i,k} + \theta_i + \theta_{st} + u_{i,t}, \quad (5)$$

where $Leads_{i,k}$ and $Lags_{i,k}$ are event indicators used to capture pre ($\beta_{k \leq -2}$) and post ($\beta_{k \geq 0}$) treatment effects relative to the duality rupture event. The relative period $k = -1$ is the baseline event — omitted from the

²We are aware these variables are potentially “bad controls” and may deviate the treatment estimates from the true estimand. However, if they are “good controls” and potentially mediate the observed effects, they would change the magnitude of our main estimates.

regression. The other variables stay consistent with Equation 4. The absence of anticipatory effects requires $\beta_{k \leq -2}$ to be statistically non-significant.

Figure 2 presents the event study results. The formal test discards the presence of anticipation effects, since all coefficients are statistically indistinguishable from zero.³ The coefficients of the lags indicate that firms change behavior from roughly two years after the duality rupture. The estimates are robust to employing Callaway and Sant’Anna (2021)’s estimator. The timing of the effects is consistent with the impacts of governance provisions in other contexts (Fauver et al., 2017; Guimarães and Trevisan, 2022).

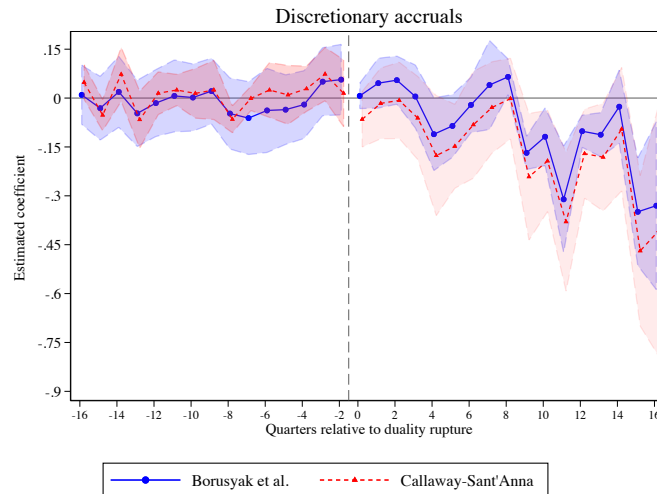


Figure 2: Dynamic Impacts of CEO Non-Duality

This figure plots estimates from the fully-dynamic event study model (as defined in Equation 4) for earnings management. The omitted period is $q = -1$. The blue dots represent baseline coefficients obtained from the estimation method of Borusyak et al. (2024) and the red triangles represent coefficients obtained from the estimation method of Callaway and Sant’Anna (2021). Shaded areas represent 90% confidence intervals.

4.3 Heterogeneous Effects

In Table 3, we investigate the impacts across firms’ characteristics in order to better understand the role of the agency mechanism. Palmon and Wald (2002) posit that firms larger in size deal with more manager-principal agency conflicts, thus they should benefit more from the separation of CEO-chairman roles in terms of enhancing information quality in reported earnings. We test for this prediction by splitting the sample into

³We do not find evidence of pre-trends in real earnings outcome. Results are available upon request.

larger and smaller firms based on their total assets and examining the treatment effects. Consistent with our argument, results show that only larger firms significantly reduce earnings manipulation through discretionary accruals, while no response is found in real activities.

Richardson (2000) shows that CEOs tend to manipulate earnings in firms where information asymmetry is higher. Since information misalignment and earnings management are intrinsically related from the agency perspective (Chowdhury et al., 2018), and investors are arguably poorly informed in companies exhibiting high discretionary accruals, we evaluate treatment effects separately by firms with high and low ex ante levels of accruals. Findings show that effects are more pronounced in those firms, suggesting that non-dual CEOs manage financial reports to subsidize shareholders making better decisions by increasing accounting information quality, thus reducing agency issues.

Dependent variable:	Discretionary accruals				Real earnings			
	Total assets		Ex ante disc. accruals		Total assets		Ex ante disc. accruals	
	Large firms	Small firms	High	Low	Large firms	Small firms	High	Low
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Duality-rupture _{it}	-0.180*** (0.004)	-0.052 (0.127)	-0.134** (0.014)	-0.034 (0.127)	0.000 (0.987)	-0.019 (0.236)	-0.015 (0.354)	-0.012 (0.364)
Observations	1,895	1,999	2,035	1,840	1,902	2,000	2,040	1,843
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N. of control/treated firms	40 / 11	40 / 15	32 / 16	48 / 10	40 / 11	40 / 15	32 / 16	48 / 10

Table 3: Heterogeneous Impacts of CEO Non-Duality on Earnings Management

This table presents results of difference-in-differences regressions, obtained from the estimation method of Borusyak et al. (2024). Subsamples are based on a median split of total assets and discretionary accruals, measured up to 2010. ***, ** represent statistical significance at the 1% and 5% levels, respectively.

5 Conclusion

This paper contributes to the debate on the effects of CEO non-duality on earnings management. We add to the empirical literature by leveraging a unique governance reform and implementing novel econometric techniques that allow us to estimate causal impacts of the governance change, thus overcoming challenges

related to endogeneity concerns faced by many previous studies. Our robust results show that the coercive separation of titles reduces earnings manipulation only through discretionary accruals, reinforcing that accrual-based and real earnings management are not necessarily substitute strategies, as found by [Cohen et al. \(2008\)](#) and [Zang \(2012\)](#) following the passage of SOX. Overall, our findings suggest that breaking CEO power concentration may benefit shareholders through improved reporting quality of financial statements.

The Brazilian case may be relevant to policymakers and regulatory authorities in contexts where governance systems are often perceived as suboptimal, as they can draw insights from this implementation to enhance governance standards and mitigate conflicts of interest between principals and managers. However, our setting imposes limitations to assess external validity. [Fauver et al. \(2017\)](#) find that heterogeneous governance reforms have distinct influence on firm value, potentially exhibiting a non-linear interaction with the level of quality of investors protection institutions. This suggests that other firm’s characteristics, such as the ability to manage earnings, could respond differently according to the institutional framework and type of governance reform. We leave these avenues to be explored in future research.

Appendix

Variable	Description
Discretionary accruals	Absolute value of the residuals of Equation 3
Real earnings	Sum of the residuals of Equation 4 and the residuals of Equation 5 (the latter is multiplied by “-1”)
Duality-rupture	Dummy variable indicating all quarters from the compliance to the regulation (for firms that dissolve the CEO duality structure)
Total assets	Logarithm of the book value of total assets
Return on assets	Ratio between earnings before taxes and total assets
Market value	Logarithm of the number of shares outstanding multiplied by stock price
Market leverage	Book value of total debt, divided by the market value and the book value of total debts
N. of family members	Dummy variable indicating if any member has a family connection with the CEO in the same firm by way of marriage, kinship, or family relationship (including parents, children, siblings, grandparents, and grandchild). Information available from 2010 onwards.
Year of foundation	Year in which the firm was established
Listing segment	Market segment where the firm’s shares are listed (two categories)
Industry	Operating sector (eight distinct categories)

Table A1: Variables Definition

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