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Interest on Equity versus Dividends: The Role of Shareholder Identity in Corporate Tax Avoidance

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Abstract

Purpose – This paper investigates whether the identity of the controlling shareholder is a determinant of the distribution of earnings (interest on equity vis-à-vis regular dividends) in a sample of Brazilian public companies. **Theoretical framework** – Through numerical exemplifications, we show that the cost of receiving cash payouts through interest on equity (IOE) is significantly heterogeneous across shareholders. We use this diversity to state the optimal distribution (from a tax standpoint) for each type of shareholder. **Design/methodology/approach** – We test the hypotheses using an unbalanced panel of 404 Brazilian firms over a 12-year period. Our estimations use probit and tobit panel data regressions. Due to endogeneity concerns about ownership identity status, we also run regressions using lagged regressors, the Heckman two-step selection model, and matched samples. **Findings** – Consistently with ex-ante, tax-driven hypotheses, we find that the presence of institutional investors significantly increases cash payouts in the form of IOE vis-à-vis cash dividends, reducing overall taxation (firm-level plus investor-level) for the average firm. Smarter tax management through dividend policy is also a positive function of firm characteristics such as size and better corporate governance standards. Overall, our evidence suggests shareholders' identity influences payout policy through the taxation channel. **Practical & social implications of the research –** Although the literature discusses several possible explanations for the limited use of IOE payments in Brazil, we provide evidence that many firms may not enjoy the tax benefits of IOE precisely because the tax law discourages controlling shareholders from using it. Such evidence is also critical for policymakers since there is currently a controversial national debate on imposing a dividend distribution tax and eliminating IOE (Law Project n. 2337, 2021), in the so-called "second phase of tax reform." **Originality/value** –

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Unlike previous studies, we discuss the distribution of IOE from the perspective of both the beneficiaries (shareholders) and payers (investees) rather than the former or the latter alone. Furthermore, as a reflection of potential measurement problems, we create a variable that measures the ratio between IOE distributed and the maximum allowed by law (IOE_IOE*), which permits a more precise measurement of the size of the tax benefit obtained by each firm.

Keywords – Shareholder Identity, Payout Policy, Tax Management, Corporate Governance, Interest on Equity.

1 Introduction

Brazilian capital markets are characterized by (i) mandatory minimum dividend rules, (ii) high corporate tax rates, (iii) non-voting shares, (iv) high ownership concentration, (v) tax-deductible dividends (called "interest on equity" – henceforth "IOE"), and (vi) taxation that depends on the legal nature of the investor. This environment makes Brazil a unique laboratory in which to study a range of corporate decisions. In this paper, we study the distribution of corporate profits through either dividends or IOE, according to the identity of the controlling shareholder of the firm. In our sample, about 40% of the firms that could benefit from legal tax deductibility by paying out IOE choose to pay only regular, non-deductible dividends. That decision may be optimal from the standpoint of the controlling shareholders, but it may destroy value for minority shareholders. Aside from this potential agency problem, understanding the corporate choice between regular dividends and IOE is vital since there is currently a controversial national debate on imposing a dividend distribution tax and eliminating IOE (Law Project n. 2337, 2021). Therefore, our research highlights a topic of academic, managerial, and policymaking importance.

In particular, we investigate whether ownership structure is a determinant of the distribution of earnings (IOE vis-à-vis regular dividends) in Brazil. Through the numerical exemplifications shown in Appendix A (Table A1), we show that the cost of receiving cash payouts through IOE is significantly heterogeneous across shareholders. For corporate shareholders, IOE payments can increase or decrease the overall tax burden – it depends on whether the firm pays additional income tax or not, among other factors (see Appendix A for details); however, for individual shareholders and associated investment entities,[i] the optimal distribution should be 100% of their cash dividends in the form of IOE, so long as this distribution does not surpass the limits imposed by law. Since the optimal distribution, from a tax standpoint, depends on the beneficiary's legal nature, we develop testable hypotheses based on taxation and ownership structure. That is, we analyze decisions regarding the distribution of dividends vis-à-vis IOE by considering the specific nature of the controlling shareholder. Therefore, this study represents a step toward better understanding why many firms in Brazil that recurrently distribute cash dividends to shareholders do not choose IOE.

This study adds to the literature in some critical respects. First, unlike previous studies, we discuss the distribution of IOE from the perspective of both the beneficiaries (shareholders) and payers (investees) rather than the former or the latter alone. Second, as a reflection of potential measurement problems, we create a variable that measures the ratio between IOE distributed and the maximum allowed by law (IOE_IOE*), which permits more precise measurement of the size of the tax benefit obtained by each firm. Finally, by exploring the heterogeneity in the tax rate on IOE income according to the shareholder's identity, we contribute to the debate about the interplay between payout policy and agency problems (Chang, Kang, & Li, 2016; Mulyani, Singh, & Mishra, 2016), the role of ownership identity in shaping corporate outcomes (Alhababsah, 2019), and clientele effects induced by heterogeneity in tax preferences among shareholders (Portal & Laureano, 2017). Importantly, our results indicate that overall taxation (firm- level plus shareholder-level) is a key factor driving payout policy.

Overall, our results suggest that shareholder identity influences payout policy through the taxation channel. Consistent with ex-ante tax-driven hypotheses, the presence of institutional ownership (mutual funds, private equity funds, private pension entities) with 5% or more of voting rights increases the likelihood of a firm distributing earnings via IOE. These shareholders are precisely the ones that benefit most from IOE payments

– receiving earnings in the form of IOE is tax-free for this type of investor (Law 9532/1997; Law 11053/2004). Moreover, our findings suggest that larger, more profitable firms with better corporate governance practices and more growth opportunities tend to distribute more cash earnings via IOE, a practice that increases the wealth of the average minority shareholder by alleviating total tax payments. Importantly, corporate governance results are restricted to firms listed in the *Novo Mercado* and Level II special segments of corporate governance of the Brazilian Stock Exchange (B3), whose rules are more demanding.[ii] When we include firms listed in the less stringent Level I special segment, the likelihood of using IOE diminishes.

The remainder of this manuscript is structured as follows. In the next section, we present a brief literature review on payout policy. In section 3 we discuss the Brazilian context, with emphasis on ownership concentration, interest on equity, and tax treatment of IOE and dividend cash distributions. In section 4 we describe our sample and method. Section 5 shows the empirical findings, and in section 6 we draw our conclusions.

2 Literature Review

2.1 Agency costs and payout policy in the recent international literature[iii]

Easterbrook (1984) pioneered the study of agency costs on payout policy. In his seminal paper, the author proposes that dividends – a financial phenomenon that is hard to explain – could mitigate perverse incentives that managers have to expropriate shareholders. Shareholders ultimately bear the agency costs implied by their relationship with managers. Two particular costs are the cost of monitoring and the cost of managerial risk-aversion. Dividends may offer a less expensive (partial) solution to these problems than other instruments. In particular, the continued outflow of cash from the company to shareholders implied by a stable dividend policy limits the number of resources available at the discretion of managers, since financing new projects would force the firm to tap the capital markets. Whenever the firm needs to raise cash in the market – either by contracting new debt or by issuing new shares – it subjects itself to independent market monitoring.

Similarly, managers are usually more risk-averse than shareholders, since their wealth depends mostly on their human capital, which is closely tied to the firm's survival. Therefore, managers may choose safer – and less profitable – projects than shareholders would. Shareholders have few mechanisms to assure that managers pick riskier projects. But both managers and shareholders can also control corporate risk by adjusting the firm's debt. *Ceteris paribus*, managers would prefer to keep financial leverage low, which would benefit creditors at the expense of shareholders. On the other hand, shareholders would prefer to raise leverage to the limit allowed by the debt covenants. Thus, a constant outflow of cash to shareholders under the form of dividends allows shareholders to prevent managers' risk aversion by preventing the debt-equity ratio from declining. As Farre-Mensa, Michaely, and Schmalz (2014) nicely summarize it, "continual exposure to the discipline of external financial markets reduces agency costs" (Easterbrook, 1984, p. 107).

The original insights of Easterbrook (1984) have spawned a rich body of literature. Research on global corporate governance characterizes controlling shareholders' influence on minority shareholders as a cutting-edge topic (Barka & Hamza, 2020; Bebchuk & Weisbach, 2010), especially in emerging markets (Kearney, 2012). Although payout policy has received considerable attention in the literature, not many papers have focused on the role of investor protection and ownership patterns, especially in emerging markets. For instance, Benavides, Berggrun, and Perafan (2016) study dividend payout policies in six Latin American countries and find that both the target dividend payout ratio and dividend smoothing are higher in countries with better governance indicators. Bradford, Chen, and Zhu (2013) investigate the effect of state and pyramid ownership on the dividend policies of listed firms in China and find that the state-controlled firms pay higher dividends while pyramid-controlled firms pay lower dividends, as the firm's chain of control lengthens.

A few recent papers have focused on the interplay between ownership structure, agency problems, and payout policy. Renneboog and Szilagyi (2015) study the role of dividend payout as an agency control device in the Netherlands, a stakeholder-oriented governance country. Concerning emerging markets, Mulyani et al. (2016) examine the roles of dividends and leverage in mitigating agency problems within family firms in Indonesia and find that, compared to non-family firms, family firms tend to maintain lower dividend payouts and higher leverage. Chang et al. (2016) study institutional ownership use of dividend payouts as a monitoring tool to mitigate firms' agency problems and find support for the role of dividend

payments as a monitoring device under high agency costs, consonant with explanations based on the potentially conflicting interests of controlling shareholders (Portal & Laureano, 2017).

Recent empirical evidence also suggests that taxation has no impact on dividend payments (Khan, Jehan, & Shah, 2017). Still, this evidence is not conditional on heterogeneous tax status according to ownership identity. By identifying different tax preferences according to the legal nature of the shareholder, we provide fresh evidence on the role of taxes in payout policy. The hypothesis driving the present study is that many firms may not enjoy the tax benefits of IOE precisely because the tax law discourages controlling shareholders from using it.

The paper closest to this one is that of Boulton, Braga-Alves, and Shastri (2012). However, there are pronounced differences between the two. First, our study focuses specifically on the agency problem induced by the different tax treatments of different kinds of ownership (corporate, individual, institutional, etc.), while the objectives of Boulton et al. (2012) are much broader. Their paper is a more general investigation of the determinants of payout policy with the added feature of also treating IOE, while ours is more focused on tax incentives and how they influence the controlling shareholder's choice between dividends and IOE, conditional on its identity. We do include other determinants of payout policy in our study but solely as control variables and not as the main focus of the investigation. Second, while Boulton et al. (2012) employ only the conventional dividend payout measure (for both dividends and IOE), we use a much finer measure: actual IOE payout relative to potential IOE. This measure better addresses the fundamental underlying question common to both studies: why are firms not using all possible tax savings allowed by the legislation? Unfortunately, the research design used by Boulton et al. (2012) cannot fully address this question. However, we also use more traditional measures of payout as robustness tests for our baseline results (IOE payments relative to total assets, earnings per share, total cash payout, and a simple IOE dummy variable). Finally, our research design carefully addresses endogeneity problems, and we employ alternative specifications to deal with them. Besides the baseline regressions, we also use lagged regressors, Heckman's two-step selection model, and matched samples. Boulton et al. (2012) do not tackle this problem in their empirical exercise. Therefore, despite the similarities between our study and that of Boulton et al. (2012), we believe our paper makes a distinct contribution to the extant literature on payout policy.

2.2 Payout policy in the recent Brazilian literature[iv]

Martins and Famá (2012) review the literature about dividend policy in Brazil between 1990 and 2010. The authors identify clear trends in the empirical evidence that shape the Brazilian landscape on payout policy. Importantly for our study, Martins and Famá (2012) confirm the existence of agency problems and the influence of tax concerns in the design of dividend policies in Brazil. Along the same lines, Forti, Peixoto, and Lima (2015) investigate the determinants of the payout policy of Brazilian listed firms from 1995 to 2011. Among several factors, the authors find a significant association between dividend payout and agency costs. In particular, they suggest that agency conflict mitigators such as tag-along provisions are substitutes for dividend payments, as predicted by Easterbrook (1984). More recently, Vancin and Procianoy (2016) investigate the effects of the mandatory dividend legislation on the determinants of Brazilian companies' payout policies. The study specifically considers the fact that dividend payments in Brazil are mandatory by law. Therefore, traditional theories of determinants of dividend payout may be distorted by the Brazilian institutional environment. Indeed, the authors find that ignoring the legal requirements on dividends induces significant biases in the regression coefficients. On the other hand, Gonzaga and Costa (2009) present mixed empirical evidence on the relationship between accounting conservatism and agency conflicts between majority and minority shareholders of Brazilian publicly-traded companies concerning their payout policies.

Although several studies confirm the effect of agency costs on the payout policies of Brazilian companies, the empirical evidence on the clientele effect is much less strong. Holanda and Coelho (2012) cannot find robust evidence of the association between the payout decision and the clientele effect in Brazil. The authors suggest that corporate governance issues and financial restrictions of the Brazilian financial market may explain their mixed results.

Santos and Salotti (2007) specifically study IOE payouts by Brazilian companies. The authors administered a survey to 388 Brazilian companies that paid IOE in 2005, inquiring about their motivations for such decisions. The authors conclude that firms mostly decided to pay IOE

because of its tax advantages, as a way to compensate for regular cash dividend payouts, and that they use up the maximum legal limit for deduction when deciding the amounts to be paid to shareholders. Despite the notable tax advantages of IOE in earnings distributions, the percentage of firms that distribute their income in that form remains relatively low (about 30.3% in our sample). Such firms may be and often are destroying value for their shareholders regarding foregone tax savings. The literature discusses several possible explanations for the limited use of IOE payments in Brazil: i) formed habits of firms and investors (Carvalho, 2003); ii) lack of more detailed regulations on the subject (Costa, Martins, Sousa, & Cardoso, 2004; Silva, Pinto, Motta, & Marques, 2006); iii) ignorance on the part of certain public firms in the computation of the amount and imputation of IOE (Costa et al., 2004); iv) risk of transitory legislation (Carvalho, 2003); v) lack of standardization in accounting treatment and disclosure of IOE (Silva et al., 2006); vi) characteristics exclusively inherent to the controlling shareholders (Portal & Laureano, 2017; Rangel & Silva, 2007); vii) lack of academic research and technical publications (Silva et al., 2006); and viii) taxation (Boulton et al., 2012; Zagonel, Terra, & Pasuch, 2018).

3 The Brazilian Context and Hypotheses Development

3.1 Ownership concentration

In Brazil, like most countries whose legal systems descend from French civil law, concentration is a fundamental characteristic of firms' ownership structure (Porta, Lopez-deTimes New RomanSilanes, Shleifer, & Vishny, 2000). Porta, Lopez-de-Silanes, and Shleifer (1999) point out that common law countries have a significantly higher proportion of widely owned firms than French civil law countries. In comparative terms, the Brazilian market is closer to those of Japan and Continental Europe, and less so to the US and UK markets (Canellas & Leal, 2009). Indeed, Porta et al. (1999) find that the highest concentration of ownership is among French civil law countries, with 54% of the average firm begin owned by the three largest shareholders (median of 55%). In their sample, Brazil's mean ownership concentration is 57% (median of 63%), very close to the French civil law mean (median).

Regarding the mean value of controlling-block votes to firm market value, Nenova (2003) estimates a mean of 25.4% (median of 22.6%) for French civil law countries. In the same study, the author calculates that the mean value of the controlling block is 23.2% for Brazil (median of 14.8%). Indeed, Nenova (2003) remarks that in Brazil, for example, a 50% vote owner can hold as little as one-sixth of the total cash flow rights, but the expected benefit from control is at least double that amount (33.3% of the value of the firm) on average. Using a different approach, Dyck and Zingales (2004) estimate that, worldwide, corporate control accounts for 14% of the equity value of the average firm, while this figure is 21% for the French civil law countries and an astonishing 65% in Brazil. Finally, Thomsen, Pedersen, and Kvist (2006) identify a significant negative effect of high block-holder ownership on firm value and accounting profitability in mostly French civil law Continental Europe.

Despite this, ownership concentration has been changing over time. In the past decades, Brazil has undergone a wave of corporate restructurings, caused by privatization and the entry of new partners in private sector firms, notably foreign and institutional investors (Silva, 2004).

3.2 Interest on equity – IOE

With the end of automatic monetary correction, a consequence of economic stabilization and the hyperinflation of previous decades, Law 9249/1995 came into effect on January 1, 1996, introducing the concept of IOE. Article 9, Paragraph 7 allows firms to impute interest paid as remuneration of equity to the value of the mandatory dividends specified in the Corporate Law. Beginning the following year in 1997, the total amount of interest paid as remuneration of equity was limited to a maximum of half the computed earnings before deduction of interest, or accumulated profits and profit reserves. This change is in accordance with the provisions of Article 79 of Law 9430/1996.

In short, the establishment of IOE represents a tax incentive for capital, parallel to the usual tax benefit for debt. Whereas debt tax shields are widely allowed throughout the world, the IOE mechanism is rare – we find a similar mechanism in Belgium alone, the "Notional Interest Deduction," which makes Belgium's national payout policy environment quite complex and peculiar.

Regarding legal interpretation, Neves (2007) argues that IOE, despite receiving the name "interest," is more similar to dividends than to interest itself. The Brazilian Securities Commission (*Comissão de Valores Mobiliários* – CVM) itself, in its Resolution 207/96, states that, regarding the concept of profit in corporate law, the distribution of return on equity constitutes distribution of income and not expenditure. Moreover, IOE may distort the comparability of corporate profits if not treated as distribution of income.

3.3 Tax differences according to legal nature of beneficiary

As mentioned above, Brazilian tax legislation provides for a 0% income tax rate on dividends received, regardless of the legal nature of who receives it. Amounts received as IOE, however, receive special tax treatment. When the recipient of IOE is an individual, the tax is final and is levied on the date of the claim, subject to the standard tax rate of 15% (Law 9249/1995, Article 9). In this case, the firm's tax gain is greater than the increase in income tax that the beneficiary will pay – therefore, it is advantageous for the firm (from a taxation standpoint) to pay out its dividends in the form of IOE, and not as regular dividends. This stands regardless of whether the paying firm (investee) has income tax due at the 15% or 25% marginal rates (Brito, 1999).

When the recipient is a corporation, the cost of receiving IOE increases significantly. According to Higushi, Higushi, and Higushi (2011), firms taxed according to the taxable income method must pay PIS (Program for Social Integration) and COFINS (Contribution to Social Security Financing) at the rate of 9.25% on income received as IOE, since these payments are not part of the financial income taxed at the zero rate (Decree 5442/2005). This is even more important in business groups with different vertical levels: an increase in the tax burden of 9.25% can occur at each step of the ladder of corporate ownership (Higushi et al., 2011). For firms taxed according to the deemed income method, besides paying PIS and COFINS of 3.65%, IOE enters the computation basis for taxes and social contributions under extraordinary income.

As a result, when the controlling shareholder is a corporation, there is a tax incentive for the controlled firm (investee) *not* to pay out earnings (or to pay less than the limit allowed by Brazilian legislation) in the form of IOE, but rather in the form of dividends, whose income tax rate is zero. Moreover, the greater the number of corporations in the vertical controlling structure ("pyramid"), the greater the potential burden of additional rates of PIS and COFINS, which translates into an even greater disincentive for such firms to pay out cash earnings via IOE. This condition is highly relevant in the Brazilian case since 77% of publicly-traded firms have a pyramid control structure (Bortolon & Leal, 2010).

Finally, we must consider the third group of beneficiaries. According to Law 9532/1997, Articles 28 and 33, when the shareholder that receives IOE is an investment fund, mutual fund, portfolio manager, or any other form of associative or collective investment, the income tax rate is zero. This means that, for this class of shareholders, there is no difference in fiscal terms between receiving earnings in the form of dividends (which are exempt for all shareholders) and IOE, although the latter reduces overall taxation at the firm level. As a result, there is a monetary incentive for associative investment entities to prefer IOE.

To elucidate the tax differences between these different shareholder types, we show a numerical example in Appendix A. The tax savings range from 34% for investment and pension funds, to 19% for individuals, to 0.75% for corporations not subject to additional income tax. For corporations subject to extra income tax, the payment of IOE implies an additional tax burden of -9.25%. Therefore, the tax incentive of the controlling shareholder to pay out IOE varies according to its fiscal identity.

3.4 Hypotheses

We consider the tax differences according to the legal nature of the beneficiary of IOE payments (section 3.3 and Appendix A) to explicitly hypothesize how ownership identity may affect payout policy. In particular, H1-H3 consider tax preferences related to the controlling shareholder. H4 (corporate governance) and H5 (firm size) refer to the likelihood of engaging in more thoughtful tax-management strategies that may enhance firm value.

H1: *ceteris paribus*, firms controlled by pension funds and investment entities are more likely to distribute IOE and pay out larger amounts of IOE (Laws 9532/1997 & 11053/2004).

H2: *ceteris paribus*, firms controlled by corporations are less likely to distribute IOE and pay out smaller amounts of IOE (Constitutional Amendment 20/1998; Laws 10637/2002 & 10833/2003).

H3: *ceteris paribus*, firms controlled by families or individuals are more likely to distribute IOE and pay out larger amounts of IOE (Constitutional Amendment 20/1998; Laws 10637/2002 & 10833/2003).

Furthermore, since theoretical models and empirical evidence support the idea that better corporate governance practices are positively associated with smarter tax-management strategies that enhance firm value (Kovermann & Velte, 2019; Minnick & Noga, 2010), we add the following hypothesis:

H4: companies subject to higher corporate governance standards (Level II and *Novo Mercado*) are more likely to distribute earnings through IOE.

Finally, because the empirical evidence suggests that firm size is an essential determinant of tax avoidance strategies (see, for example, Dyreng, Hanlon, & Maydew, 2008), we also test a hypothesis concerning firm size:

H5: the likelihood of distributing IOE and the amount paid out as IOE are positively related to firm size.

We test these five hypotheses in section 5 – Results and Discussion. In the next section, we detail our methodology and sample definition.

4 Method

4.1 Identification strategy

The identification strategy of our paper relies on the unique corporate tax environment in Brazil, which allows firms to substitute regular, non-deductible dividends for IOE – a tax-deductible type of dividend. Brazilian legislation, specifically Law 9249/1995, introduces the concept of IOE. Article 9, Paragraph 7 of this law allows firms to deduct, in the calculation of their actual profit, the "interest" paid to shareholders as remuneration of equity (these deductions work the same way as debt-related expenses). Payment is limited, however, to a maximum of (i) half the computed earnings before deduction of interest; or (ii) half the accumulated profits and profit reserves. Importantly, firms can use both traditional dividends and IOE to comply with the mandatory dividends rule, which makes dividends and IOE almost perfect substitutes in payout policy. Therefore, in addition to ordinary dividends, whose tax rate for shareholders is 0%, Brazilian publicly-traded firms have an alternative channel for distributing profits to shareholders. With distinct tax advantages, profit distribution in Brazil is an effective instrument within a business environment of high taxes and limited legal options for implementing appropriate tax planning.

4.2 Data collection and sample definition

The sample consists of firms whose shares were listed on the Brazilian Stock Exchange (B3) over the period from 1997 to 2008.[v] The data sources are the *Economática*® database, which provides financial information, and the *INFOinvest*® proprietary system, which gathers information on the ownership structure of listed firms. The advantage of the latter compared to directly accessing the database of the CVM (equivalent to the US-SEC) is that it groups and lists information at the individual shareholder level, making it easier to obtain data on more vertical structures.

Our initial sample comprises 1156 common and preferred stocks. We drop firms that were not eligible to distribute IOE according to Brazilian corporate legislation (firm-year without current profits or positive retained earnings). Because we want to understand the *choice* between IOE and regular dividends, we follow Boulton et al. (2012) and eliminate firms that do not distribute cash dividends (IOE or regular dividends). Furthermore, if a firm has more than one class of non-voting shares, we eliminate the least liquid class. Finally, we drop firms with less than three firm-year observations during the sample period. Following this procedure, this study's final sample consists of an unbalanced panel of 404 firms. To limit the undesired influence of outliers, we winsorize all continuous variables in this study at the level of 2.5% in each tail.

4.3 Ownership structure variables

The classification of the ownership structure variables follows the logic of the differentiated rates of taxation upon receipt of IOE. Following the methodology of Bortolon and Leal (2010), we analyze direct and indirect ownership structures. The purpose of applying this methodology is to understand not only the direct shareholding in the investee but also the composition of

the shareholders at the second and other levels. In many cases, shareholders obtain substantial holdings by indirect means, controlling other firms that have shares in the investee, forming a pyramid control structure. Figure 1 summarizes the criteria considered in the classification of the variables of ownership structure.

4.4 Model, construct, and variable definitions

The general model of this study is as follows:

$$Y_{it} = \alpha_0 + \sum_{j=1}^{n} \beta_j X_{jit} + \sum_{k=1}^{m} \delta_k Z_{kit} + \mu_{ijt} \quad (1)$$

$$\mu_{ijt} = c_i + \varepsilon_{ijt} \quad (2)$$

Where Y_{ijt} is a measure of IOE payout for firm *i*, in year *t*. In our model, X_{ijt} represents ownership structure variables (*IND, CS2, CS3, FUNDS, GOV, FUNDS_PART, VOTING_SHARES, CONTROL_TOTALCAP* for firm *i* in year *t*), Z_{kit} are control variables (*SIZE, EBITDA_TA, PROFITRES_TA, ROA, FINEXPENSES_TA, DEPREC_TA, LEVERAGE, ADR, N2_NM, N1_N2_NM, MARKET_BOOK* for firm *i* in year *t*), μ_{it} is the joint error term, which represents the sum of the unobserved idiosyncratic firm effects, c_i, and the error term, ε_{it}. We show details on all variables in Appendix D – Table D1.

We estimate Equation (1) using probit and tobit panel data estimations. These models are widely used in the literature when a subset of the sample is censored (for examples in the payout policy context, see Boulton et al., 2012; Brockman & Unlu, 2009; Truong & Heaney, 2007). Furthermore, to facilitate the analysis of the economic significance of the results, we report the marginal effects instead of the regular coefficients of each regressor.

5 Results and Discussion

5.1 Descriptive statistics and univariate analysis

In terms of descriptive statistics (see Table 1), the average firm in our sample distributed cash dividends through IOE 30.3% of the time (mean of *IOE_BIN*) from 1997 to 2008. Regarding magnitude, the average IOE payment as a fraction of what the corporate legislation allows is 19.3% (*IOE_IOE**), with substantial dispersion – while firms in the 10th, 25th, and 50th percentiles do not use IOE to pay out cash dividends (*IOE_IOE** equals zero), firms in the 70th and 90th percentiles use as much

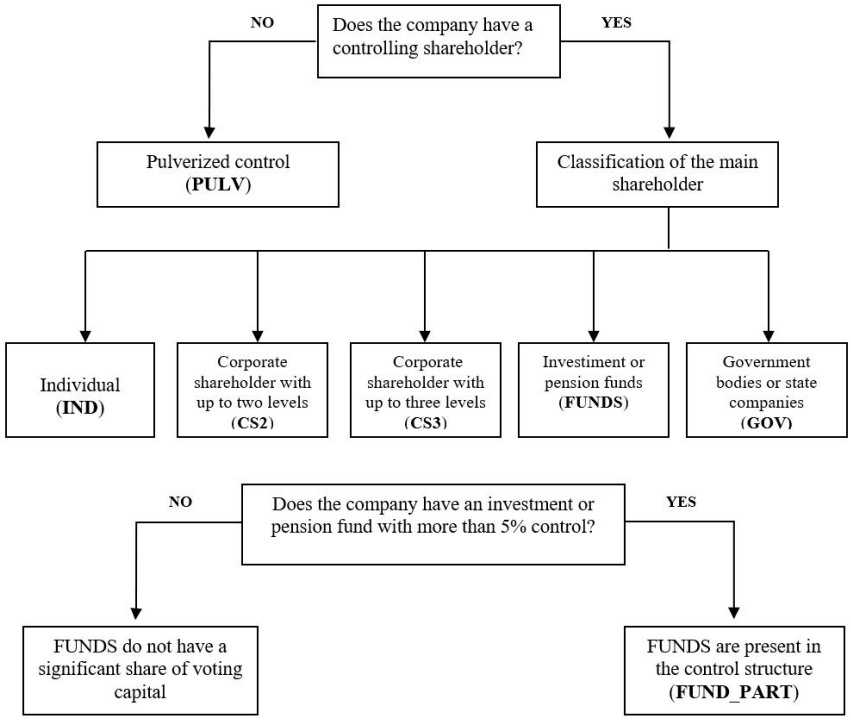

Figure 1. Classification and definition of variables regarding the identity of the controlling shareholder

Table 1
Descriptive statistics

Variable	Mean	p50	SD	p10	p25	p75	p90	N
IOE_IOE*	0.193	0.000	0.340	0.000	0.000	0.285	0.903	2033
IOE_BIN	0.303	0.000	0.459	0.000	0.000	1.000	1.000	2033
IOE_TA	0.005	0.000	0.010	0.000	0.000	0.007	0.023	2033
IOE_PAYOUT	0.207	0.000	0.359	0.000	0.000	0.280	0.980	2033
IOE_EPS	0.078	0.000	0.141	0.000	0.000	0.117	0.320	2033
SIZE	14.634	14.697	1.697	12.277	13.408	15.747	16.991	2033
EBITDA_TA	0.138	0.138	0.089	0.039	0.084	0.196	0.247	2033
PROFITRES_TA	0.126	0.109	0.109	0.010	0.042	0.195	0.282	2033
FINEXPENSES_TA	0.065	0.053	0.060	0.009	0.028	0.083	0.127	2033
DEPREC_TA	0.044	0.035	0.036	0.006	0.023	0.054	0.092	2033
MARKET_BOOK	1.624	1.102	1.593	0.359	0.597	2.014	3.486	2033
ADR	0.192	0.000	0.394	0.000	0.000	0.000	1.000	2033
N2_NM	0.064	0.000	0.246	0.000	0.000	0.000	0.000	2033
IND	0.094	0.000	0.293	0.000	0.000	0.000	0.000	2033
CS2	0.231	0.000	0.421	0.000	0.000	0.000	1.000	2033
CS3	0.518	1.000	0.500	0.000	0.000	1.000	1.000	2033
GOV	0.034	0.000	0.182	0.000	0.000	0.000	0.000	2033
FUNDS	0.058	0.000	0.233	0.000	0.000	0.000	0.000	2033
FUNDS_PART	0.308	0.000	0.462	0.000	0.000	1.000	1.000	2033
VOTING_SHARES	0.571	0.550	0.255	0.222	0.387	0.778	0.968	2033
CONTROL_TOTALCAP	1.644	1.510	0.632	1.000	1.070	2.050	2.670	2033

Note: This table shows the descriptive statistics of the variables used in the study. The final sample is an unbalanced panel of 404 Brazilian firms that distributed cash dividends, either via regular dividends, interest on equity (IOE), or a mix of both. The sample period is 1997-2008. The definition of variables is shown in the Appendix.

as 28.5% and 90.3% of the maximum allowed for IOE payments, respectively.

Table 1 also shows the descriptive statistics of the independent variables used in our study. We highlight the core statistics regarding ownership structure, the independent variables that most relate to our hypotheses: more than half of the firm-year observations are controlled by a firm with up to three vertical levels before the ultimate individual shareholder (mean of *CS3* = 0.518). The second most recurrent legal nature of the controlling shareholder is a firm with up to two vertical levels before the ultimate individual shareholder (mean of *CS2* = 0.231), followed by direct control by individuals (mean of *IND* = 0.094), associate investment entities (mean of *FUNDS* = 0.058), and government bodies or state-owned firms (mean of *GOV* = 0.034). Notably, 30.8% of the observations have, in their ownership structure, at least one associative investment entity holding 5% or more of the voting capital (mean of *FUNDS_PART* = 0.308). We do not find multicollinearity issues among the independent variables used in the empirical model – the correlations among the covariates are generally weak (maximum of 0.54 between ADR and SIZE, minimum of -0.57 between CS2 and CS3, and all other correlations are between 0.36 and 0.33). The stratification of observations across industries is provided in Appendix D – Table D2. Furthermore, in Appendix D, we show the correlation matrix of all the variables and the variance inflation factor (VIF) in Table D3 and Table D4, respectively.

5.2 Multivariate analysis: does ownership identity influence interest on equity payments?

The multivariate analysis provides essential answers to three fundamental questions: i) which factors lead firms to distribute IOE?; ii) which factors cause firms to distribute larger or smaller amounts of cash in the form of IOE?; and iii) does the identity of the controlling shareholder influence the decision to distribute IOE? A summary of the results concerning these questions is outlined in Table 2.

As with other empirical studies that address choices regarding the distribution of dividends (Brockman & Unlu, 2009; Truong & Heaney, 2007) and IOE (Boulton et al.,

2012), the present study finds evidence that larger, more profitable firms with higher growth opportunities are more likely to distribute via IOE. Specifically, the results shown in Table 2 suggest that the probability of an average-sized firm distributing IOE increases with the size of its total assets (*SIZE*), with its earnings before interest, taxes,

Table 2
Propensity and amount of distribution of IOE: Probit and Tobit models

VARIABLES	ESTIMATION METHOD							
	PROBIT				TOBIT			
	REG_1	REG_2	REG_3	REG_4	REG_5	REG_6	REG_7	REG_8
CONSTANT	-8.8995***	-8.0690***	-9.0296***	-8.9072***	-3.0865***	-4.7373	-3.1986***	-5.1237
	(-9.74)	(-6.30)	(-9.56)	(-6.73)	(-8.93)	(-0.10)	(-9.02)	(-0.10)
SIZE	0.3884***	0.3055***	0.3775***	0.3184***	0.1203***	0.0837***	0.1294***	0.1027***
	(6.89)	(4.80)	(6.54)	(4.97)	(5.60)	(3.44)	(5.89)	(4.17)
EBITDA_TA	2.1237***	2.0905**	1.7265**	2.0190**	0.9365***	1.0245***	0.8688***	1.0389***
	(2.73)	(2.51)	(2.23)	(2.41)	(3.36)	(3.47)	(3.11)	(3.49)
PROFITRES_TA	1.7524***	1.1179	1.7238***	0.8885	0.3114	0.0401	0.3204	0.0277
	(2.68)	(1.61)	(2.60)	(1.24)	(1.33)	(0.16)	(1.36)	(0.11)
DEPREC_TA	1.1802	1.2803	2.4758	2.8548	1.2429**	1.3103**	1.7741***	1.8539***
	(0.74)	(0.77)	(1.47)	(1.64)	(2.25)	(2.31)	(3.09)	(3.15)
FINEXPENSES_TA	-1.2967	-1.4869	-1.0173	-1.0676	-0.6876	-0.6915	-0.5836	-0.5144
	(-1.07)	(-1.17)	(-0.84)	(-0.83)	(-1.62)	(-1.60)	(-1.37)	(-1.18)
ADR	0.3952*	0.2298	0.5165**	0.3587	0.0937	0.0478	0.1538**	0.1149
	(1.89)	(0.99)	(2.44)	(1.48)	(1.22)	(0.56)	(1.99)	(1.30)
N2_NM	0.1914	0.3210	0.5510**	0.6040**	0.1188	0.1961**	0.2051**	0.2708***
	(0.80)	(1.22)	(2.10)	(2.10)	(1.46)	(2.21)	(2.41)	(2.89)
MARKET_BOOK	0.0746*	0.0880**	0.0793**	0.0916**	0.0137	0.0154	0.0140	0.0167
	(1.84)	(2.11)	(2.00)	(2.24)	(0.97)	(1.07)	(1.01)	(1.18)
IND		-0.0941		0.5529		0.0169		0.2257*
		(-0.25)		(1.43)		(0.13)		(1.65)
CS2		-0.4838		-0.1727		-0.0719		0.0322
		(-1.58)		(-0.55)		(-0.63)		(0.28)
CS3		0.1732		0.1775		0.1038		0.1122
		(0.57)		(0.56)		(0.93)		(0.98)
GOV		0.8851*		0.8725		0.3159		0.2541
		(1.65)		(1.60)		(1.61)		(1.27)
FUNDS		-0.3635		-0.2300		-0.0384		0.0172
		(-0.95)		(-0.60)		(-0.29)		(0.13)
FUNDS_PART		0.3326*		0.3583*		0.1498**		0.1464**
		(1.65)		(1.80)		(1.99)		(1.96)
VOTING_SHARES		-0.3097		-0.2140		-0.1246		-0.0876
		(-0.97)		(-0.69)		(-1.06)		(-0.76)
CONTROL_TOTALCAP		0.5025***		0.4480***		0.2081***		0.1884***
		(4.55)		(4.16)		(5.12)		(4.77)
Observations (n)	2358	2033	2358	2033	2358	2033	2358	2033
Log likelihood	-803.24	-716.74	-772.29	-691.58	1241.14	1171.38	1271.31	1193.61
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	Yes	Yes	No	No	Yes	Yes

Notes: This table presents the marginal effects of the probit [REG1, REG2, ..., REG4] and tobit [REG5, REG6, ..., REG8] panel data regressions for the dependent variables IOE_BIN and IOE_IOE*, respectively. While the former equals one if the firm distributed IOE in the current year and zero otherwise, the latter represents the ratio between the amount of distribution of IOE in year t and the maximum allowed by Brazilian tax legislation. Year and industry dummies are included (as indicated) to capture time and industry invariant effects. Even-numbered regressions are similar to the previous regression (base model) but include the ownership structure variables. The estimated coefficient and the z statistic (in parentheses) are reported for each variable. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

depreciation, and amortization (*EBITDA_TA*), market-to-book value (*MARKET_BOOK*), and the control-ownership disparity (CONTROL_TOTALCAP). The coefficients of these variables are statistically significant and robust to multiple specification designs. The size effect suggests that smaller firms, which are typically less professionalized as regards management, tend to deliver less IOE than larger firms (corroborating H5). This effect may also relate to economies of scale, among other features of larger firms.[vi] Another significant result is that the shares most likely to pay IOE trade with larger *MARKET_BOOK* indices, such that there is a premium on the market value of such firms. In other words, more valuable firms choose to pay out their earnings through IOE, acknowledging that the practice provides tax relief at the firm level and aggregates value for the shareholder. Finally, the higher the disparity between cash flow rights and voting rights, the higher the propensity of a firm to pay out through IOE, an indication that firms whose voting rights are more closely held are more likely to take advantage of tax-saving opportunities.

In the even-numbered columns of Table 2, which include the ownership structure variables, we find more striking results concerning the presence of institutional investors (*FUNDS_PART*) in the controlling structure. Corroborating H1, the presence of these investors leads to a higher propensity to distribute (about 33% to 35% more likely than an otherwise similar firm, according to *REG_2*, *REG_4*) and a greater amount of distribution by IOE (*REG_6*, *REG_8*). The presence of institutional investors, not necessarily holding controlling positions, seems to generate a substantial incentive (similar to the findings of Firth, Gao, Shen, & Zhang, 2016). These institutions, often pension funds, exert considerable influence on the firms within their portfolios, even when they do not hold a majority position. This result strengthens the argument known in the literature as "pension fund activism" (Grinstein & Michaely, 2005, for a general discussion and application; Punsuvo, Kayo and Barros, 2007, for the Brazilian case), which considers the influence of such funds on various aspects of the firm.

Furthermore, regarding the analysis of the corporate governance construct, firms listed in Level II or on the *Novo Mercado* (special corporate governance segments of the B3) present positive and statistically significant coefficients in the models that include variables of ownership structure and controls for year and industry effects (*REG_4*, *REG_8*). This evidence suggests that better corporate governance practices increase the likelihood of an average firm enjoying the tax benefits of IOE when distributing earnings. However, we emphasize one particularly important aspect. Inclusion of the Level I special segment of corporate governance (*N1_N2_NM*) dummy reverses the sign of the coefficients of the variable *N2_NM* in both the probit and tobit models. This result strengthens the argument that Level I is a segment with a lower degree of membership requirements, which places it much closer to the traditional market than the *Novo Mercado*. In this sense, considering distribution by IOE as a practice that creates shareholder value, the probability of firms using this tool only increases with listing in Level II or on the *Novo Mercado*, where corporate governance standards are more demanding (corroborating H4).

Unlike Level II and the *Novo Mercado*, membership of Level I does not require, for example, mandatory bid rules for non-voting and minority shares ("tag-along rights"), voting rights to preferred shareholders on matters of greater importance (mergers and acquisitions and major asset sales), adherence to the stock exchange's arbitration board, or mandatory offers to repurchase shares in circulation in the case of delisting or deregistration of the stock in that listing segment. This lower level of requirements for good governance appears to be reflected in the results, since the same effect found in the *Novo Mercado* and in Level II is not observed in Level 1, indicating the importance of listing in segments with higher governance standards.

An alternative mechanism can also explain our results. Agency problems between insiders (controlling shareholders and entrenched managers) and outsiders (minority shareholders) create an incentive for insiders to divert corporate value or consume perquisites at the expense of outsiders, which generally reduces corporate tax liabilities. Firms that are committed to higher standards of corporate governance make it more difficult for insiders to expropriate wealth from outsiders, increasing the corporate tax bill and thus the tax benefits of deductible IOE payments. Such an effect may be substantial in Brazil, one of the countries with the highest value of private benefits of control (Dyck & Zingales, 2004).

5.3 Robustness checks

Since we create a new variable to better measure the global benefits of using IOE instead of dividends (*IOE_IOE**), we test the variables commonly used in the literature to check whether our results remain unchanged.

Table 3
Analysis of sensitivity to alternative dependent variables, tobit models

VARIABLES	DEPENDENT VARIABLE							
	IOE_IOE*		IOE_TA		IOE_PAYOUT		IOE_EPS	
	REG_1	REG_2	REG_3	REG_4	REG_5	REG_6	REG_7	REG_8
CONSTANT	-3.1986***	-5.1237	-0.0939***	-0.1513	-1.5195***	-1.3709***	-3.7536***	-3.5120***
	(-9.02)	(-0.10)	(-8.84)	(-0.09)	(-9.10)	(-6.13)	(-9.18)	(-6.22)
SIZE	0.1294***	0.1027***	0.0037***	0.0028***	0.0665***	0.0581***	0.1631***	0.1295***
	(5.89)	(4.17)	(5.64)	(3.84)	(6.53)	(5.14)	(6.49)	(4.71)
EBITDA_TA	0.8688***	1.0389***	0.0347***	0.0409***	0.1732	0.2628*	-0.0691	0.1179
	(3.11)	(3.49)	(4.03)	(4.48)	(1.25)	(1.78)	(-0.21)	(0.34)
PROFITRES_TA	0.3204	0.0277	0.0219***	0.0134*	0.3345***	0.2542**	0.9050***	0.5182*
	(1.36)	(0.11)	(3.05)	(1.77)	(2.89)	(2.07)	(3.28)	(1.78)
DEPREC_TA	-0.5836	-0.5144	-0.0135	-0.0113	-0.3534	-0.3510	-0.3090	-0.2963
	(-1.37)	(-1.18)	(-1.03)	(-0.84)	(-1.63)	(-1.56)	(-0.63)	(-0.59)
FINEXPENSES_TA	1.7741***	1.8539***	0.0727***	0.0754***	0.5816**	0.6376**	2.0380***	2.0223***
	(3.09)	(3.15)	(4.10)	(4.15)	(1.98)	(2.12)	(2.95)	(2.83)
ADR	0.1538**	0.1149	0.0059**	0.0041	0.0773**	0.0499	0.1966**	0.0961
	(1.99)	(1.30)	(2.56)	(1.58)	(2.14)	(1.22)	(2.23)	(0.97)
N2_NM	0.2051**	0.2708***	0.0042	0.0060**	0.1124***	0.1147**	0.2331**	0.2484**
	(2.41)	(2.89)	(1.61)	(2.11)	(2.70)	(2.53)	(2.31)	(2.25)
MARKET_BOOK	0.0140	0.0167	-0.0003	-0.0002	0.0002	0.0035	-0.0110	-0.0040
	(1.01)	(1.18)	(-0.60)	(-0.37)	(0.03)	(0.50)	(-0.66)	(-0.23)
IND		0.2257*		0.0028		0.0642		0.2093
		(1.65)		(0.68)		(0.99)		(1.33)
CS2		0.0322		-0.0015		-0.0396		-0.0469
		(0.28)		(-0.45)		(-0.72)		(-0.36)
CS3		0.1122		0.0010		-0.0109		0.0811
		(0.98)		(0.28)		(-0.20)		(0.62)
GOV		0.2541		0.0094		0.0932		0.4957**
		(1.27)		(1.62)		(1.02)		(2.23)
FUNDS		0.0172		-0.0028		-0.0700		-0.0228
		(0.13)		(-0.69)		(-1.09)		(-0.15)
FUNDS_PART		0.1464**		0.0058***		0.0729**		0.1692**
		(1.96)		(2.66)		(2.17)		(2.04)
VOTING_SHARES		-0.0876		-0.0004		-0.0389		-0.1625
		(-0.76)		(-0.12)		(-0.72)		(-1.24)
CONTROL_TOTALCAP		0.1884***		0.0051***		0.0504***		0.1784***
		(4.77)		(4.26)		(2.69)		(3.92)
Observations (n)	2358	2033	2358	2033	2358	2033	2358	2033
Log likelihood	-1013.21	-1013.21	1271.31	1193.61	-1162.53	-1050.85	-574.82	-506.60
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table presents the marginal effects of the tobit panel data regressions for the dependent variables IOE_IOE*, IOE_TA, IOE_PAYOUT, and IOE_EPS, respectively. The definitions of these variables are shown in the Appendix. Year and industry dummies are included (as indicated) to capture time and industry invariant effects. The even-numbered regressions are similar to the previous regression (base model) but include the ownership structure variables. The estimated coefficient and the z statistic (in parentheses) are reported. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 3 shows the results using the same methods as Table 2, but with alternative dependent variables (*IOE_TA*, *IOE_EPS*, and *IOE_PAYOUT*). Overall, the estimates yield very similar results: the variables that measure size, profitability, good governance, and the presence of institutional investors in the control structure remain positive and significant determinants of distribution by IOE in the firms analyzed.A second point of verification

is whether the results are the same for different sample splits. The motivation behind this analysis is that the percentage of firms that distribute IOE jumps dramatically in 2005 (see Appendix C for a graphical visualization). Thus, we consider splitting the sample into two parts, 1997-2004 and 2005-2008. The results, reported in Appendix D – Table D5, suggest that the presence of institutional investors in the ownership structure has a stronger influence on firm cash distribution decisions in the 2005-2008 period. One possible explanation for this difference is the enactment of Law 11053/2004, which from January 1 of 2005 has made explicit the fiscally privileged nature of pension funds regarding financial incomes (see Colombo & Caldeira, 2018, for details).

In a third robustness check, we use different independent variables and check whether the results remain unchanged. In addition to the aforementioned change in the results for corporate governance with the inclusion of the firms listed in Level I (*N1_N2_NM*), profitability remains a positive and significant determinant if measured by return on assets (*ROA*). As Brazilian tax law began to allow firms to use accumulated losses in prior fiscal years to reduce taxes owed, a practice known as "carry-over," we include in the models a variable (*PREV_LOSSES*) that equals 1 if a firm has accumulated losses and 0 otherwise. As expected, accumulated losses reduce the propensity of an average firm to distribute profits by IOE, since the attractiveness of this legal instrument declines.

A fourth robustness check refers to additional covariates that may explain the likelihood of distributing earnings through IOE. To be concrete, we include as additional explanatory variables the yearly changes in the EBITDA margin (GROWTH_MGEBITDA) and the current liquidity ratio (CURR_LIQ). These additional covariates did not show statistical significance in the probit and tobit estimations (see Appendix D – Table D6 for the reported results). More important to our research question, our conclusions do not change with the inclusion of these potential omitted variables.

Finally, we perform several extra robustness checks that we disclose in Appendix E – Table E1. Besides presenting theoretical arguments, we include additional regressions considering ownership identity as potentially endogenous – lagged regressors, Heckman's two-step selection model, and matched samples to control for observable differences between pension fund and non-pension fund ownership. Nevertheless, the main results of this research stand unchanged. Additional details on the covariate balance before and after the propensity score matching (PSM) are shown in Appendix F – Figure F1 and Figure F2.

6 Concluding Remarks

This study seeks to further elucidate the distribution of interest on equity (IOE) in publicly-traded Brazilian firms by considering the effects of tax laws on both the firm and its shareholders. This approach highlights the close relationship between ownership structure, corporate governance, and distribution of earnings in Brazil, and represents an improvement over other studies that examine the issue strictly from the perspective of the distributing firm (Boulton et al., 2012; Ness & Zani, 2001). We also shed light on the role of taxation in creating agency problems among different shareholders, and how corporate governance can mediate them. In terms of implications, understanding the corporate choice between regular dividends and IOE is critical since there is currently a controversial national debate on imposing a dividend distribution tax and eliminating IOE.

Overall, our results suggest that ownership identity influences the distribution of IOE in Brazilian firms. Consistently with *a priori* expectations, we find strong evidence that the presence of institutional investors with more than 5% of voting capital increases the likelihood of a firm distributing earnings via IOE. This group of investors, which includes mutual funds, private equity funds, private pension entities, and managed portfolios, benefits from receiving a zero tax rate when receiving earnings in the form of IOE, in accordance with Laws 9532/1997 and 11053/2004. Furthermore, larger, more profitable firms with better corporate governance practices and more growth opportunities tend to distribute more cash earnings via IOE, a practice that increases the wealth of the average minority shareholder by alleviating total tax payments. Importantly, the corporate governance results are restricted to firms listed in the *Novo Mercado* and Level II special segments of corporate governance, whose rules are more demanding. When we include firms listed in the less stringent Level I special segment, there is no improvement in the use of IOE.

By exploring the heterogeneity in the tax rate on IOE income according to shareholder identity, we contribute to the debate about the interplay between payout policy and agency problems (Chang et al., 2016; Mulyani et al., 2016) and clientele effects induced by

heterogeneity in tax preferences among shareholders (Portal & Laureano, 2017). We also provide new evidence that overall taxation (firm- level plus shareholder-level) is an essential factor driving payout policy, and thus we contribute to a growing body of literature concerning taxes and corporate decisions (see, e.g., Colombo & Caldeira, 2018; Graham, Hanlon, Shevlin, & Shroff, 2017).

Although this study contributes theoretically and empirically to a better understanding of the use of IOE by listed firms in Brazil, many questions remain unanswered. The Brazilian institutional environment, marked by a complex tax system involving high taxation rates, is one of the most conducive to tax avoidance. Even so, many firms, even some controlled by groups of shareholders that would directly benefit from its use, have not yet adopted the practice of distributing as many earnings by IOE as legally allowed. For this reason, in future studies, it would be valuable to investigate in greater detail this decision-making process and to assess the degree to which controlling shareholders influence it.

Notes

[1] As noted by Angrist and Pischke (2008), reducing potential biases due to observable factors is likely to reduce biases from unobservable factors too.

[i] Associate investment entities include institutional investors such as mutual funds and pension funds, and also investment clubs.

[ii] We provide a comparison among each special segment of corporate governance of the Brazilian Stock Exchange in Appendix B.

[iii] It is not our aim to present a comprehensive literature review on such a broad subject in the finance literature. That would be an overwhelming task. We thus refer the interested reader to the excellent review presented by Farre-Mensa, Michaely, and Schmalz (2014).

[iv] Again, it is not our aim to present a comprehensive literature review on the Brazilian literature. That would be beyond the scope of this paper. Therefore, we refer the interested reader to the excellent review presented by Martins and Famá (2012).

[v] Our sample period is limited to these years because the database we used as our main source of data is proprietary (INFOinvest®) and a private service from Donnelley Financial Solutions (for details, please visit https://infoinvest.com.br/en), and we were not granted access to more recent years. Unfortunate as it is, this proprietary database has one crucial advantage for our empirical investigation: it provides detailed information regarding ownership of Brazilian companies up to their ultimate shareholder for each of the 404 firms in our sample. Moreover, in section 5 we provide robustness tests comparing our results with earlier and later periods than our sample coverage and the results are unchanged.

[vi] For instance, larger firms can bear the cost of legal demands that smaller firms cannot.

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Appendix A
Numerical Example of Shareholder Taxation in Brazil

Table A1 shows a numerical example of the tax differences between different shareholder types. Distributing profits by IOE leads to overall tax savings of 19% for individuals. This amount is precisely the sum of savings in the corporate tax and social contribution rates on net profits (approximately 34% for firms taxed under the taxable income regime), minus corporate income tax withheld (15%), which is levied on the individual beneficiary. This tax benefit is proportional to the amount distributed as IOE; thus, for higher payouts, the tax savings for the firm would be even greater.

Unlike the increase in shareholder wealth of individuals in any taxpayer classification, in the case of corporate shareholders, the overall tax benefit depends on the incidence of additional income tax on the investing firm. As summarized in Table A1, in the case of corporate shareholders not subject to additional taxes (revenues up to R$240,000 per year), there are small tax savings of 0.75%. However, for high-earning corporate shareholders subject to the additional 10% income tax rate, the tax benefit at the investee level (34%) is offset by an equivalent amount at the level of the beneficiary (34%), not considering the incidence of PIS and COFINS. In this case, the tax savings are negative by the exact percentage of the incidence of these social contributions (-9.25%). Note that these conclusions assume that the firm is taxed under the taxable income regime and that the firm can offset the 15% income tax withheld in its annual tax returns.

The results of the simulations with corporate beneficiaries are similar to those described by Libonati, Lagioia, and Maciel (2008), even though these authors do not consider the impact of additional PIS and COFINS on the financial income derived from IOE (Decree 5442/2005). Brito (1999) reaches the same conclusion, that is, the tax savings for the payer of IOE, in the case of corporate beneficiaries, occurs in only two situations: i) when the beneficiary makes a tax loss and thus has negative earnings before taxes in that fiscal year; ii) when the payer of the earnings is subject to additional tax but the beneficiary is not. As a result, the overall net benefit for corporate investors should be analyzed on a case-by-case basis.

Finally, if the beneficiary shareholder is an institutional investor (associative investment entity), the overall net benefit is evident. Exemption from withheld income tax allows these beneficiaries the full tax benefit at the level of the investee (34%). Thus, for these shareholders, the tax savings generated through the distribution of profits through IOE rather than dividends are 34%, as shown in Table A1. Among all the legal forms of the beneficiary, associative entities are those that benefit most from distribution by IOE.

Table A1
Summary of tax differences in receipt of IOE

Legal nature of shareholder	Individual	Corporation not subject to additional IT	Corporation subject to additional IT	Investment funds and pension funds
A) Rates levied on IOE revenues				
Income tax (IT) withheld at source (1)	15% (final)	15% (compensable)		0%
CSLL (2)	-	9%		-
Additional income tax (revenues over R$240,000/yr) (3)	-	0%	10%	-
PIS / COFINS (4)	-	9.25%		-
B) Overall tax savings				
Tax benefit at the firm level	34.00%	34.00%	34.00%	34.00%
Taxation at the beneficiary level (1 + 2 + 3 + 4)	15.00%	33.25%	43.25%	0.00%
Overall tax savings with the use of IOE	**19.00%**	**0.75%**	**-9.25%**	**34.00%**

Note: The above simulation uses tax rates prevailing in Brazil from 1996 to 2015. Firms with gross annual revenues over R$240,000 pay, in addition to income tax of 15% withheld and 9% Social Contribution on Net Profit (CSLL), 10% additional corporate income tax, totaling approximately 34% of taxes on income before taxes. The rate of payment of IOE reflects the legislation relevant to each type of beneficiary, according to their specific regimen. Corporations receiving IOE can offset the income tax withheld in the receipt of IOE with the tax due in the current year, and this simulation hypothesizes that 100% of this tax is deductible from the amount actually due in annual tax returns. The analysis of global tax savings with the distribution of IOE considers the total taxes paid by the investor and investee. Therefore, the differential in terms of creation (destruction) of wealth for each type of shareholder is in the positive (negative) tax saving from the standpoint of both the firm (investee) and beneficiaries (shareholders). In percentage terms, the overall tax savings with the distribution of IOE is obtained by dividing the absolute value of the overall tax savings by whatever would have been paid in overall taxes in the event that all profits were distributed as dividends.

Appendix B

Comparative overview of special listing segments in the São Paulo Stock Exchange

SEGMENT	*NOVO MERCADO*	LEVEL 2	LEVEL 1	BOVESPA MAIS	BOVESPA MAIS LEVEL 2	TRADITIONAL
Characteristics of traded stocks	Voting stocks only	Voting and non-voting stocks allowed (but with additional rights)	Voting and non-voting stocks allowed (according to legislation)	Voting stocks only	Voting and non-voting stocks allowed (according to legislation)	
Percentage of stocks trading (free float)	Minimum of 25% free-floating stocks			Minimum of 25% free-floating stocks (target up to 7th year from accession)		No rules
Public stock offerings and distribution	Targeting stock ownership dispersion			No rules		
Ban on statutory provisions	Limitations to voting rights below 5% of capital, qualified quorum, and "immutable clauses"		No rules	Qualified quorum and "immutable clauses"		No rules
Board of directors' composition	Minimum of 5 directors (according to the legislation), 20% of which should be independent, with unified 2-year terms		Minimum of 3 directors (according to legislation) with unified 2-year terms			Minimum of 3 directors (according to legislation)
Ban on the duality of roles	Chairman of the board and CEO (a grace period of 3 years from accession)			No rules		
Duties of the board of directors	Pronouncement on any public offer for share acquisition		No rules			
Financial statements	Translated into English		According to legislation			
Hosting an annual meeting	Mandatory			Optional		
Corporate events calendar	Mandatory					Optional
Additional disclosure	Securities trading policy and code of conduct			Securities trading policy		No rules
Mandatory bid rule ("tag along" rights)	100% for common stock		80% for common stock (according to legislation)	100% for common stock	100% for common and preferred stock	80% for common stock (according to legislation)
Public offer for the acquisition of shares at economic value (minimum)	Mandatory in the case of delisting from segment or cancellation of public company registration (going private)		According to legislation	Mandatory if delisting from segment or cancellation of public company registration (going private), except if migration to *Novo Mercado*	Mandatory if delisting from segment or cancellation of public company registration (going private), except if migration to *Novo Mercado* or Level 2	According to legislation
Market arbitration panel accession	Mandatory		Optional	Mandatory		Optional

Source: http://www.b3.com.br/en_us/products-and-services/solutions-for-issuers/listing-segments/about-listing-segments/

Appendix C

Evolution of interest on equity (IOE) in Brazil

The assessment of the time series of firms that pay IOE in the 1997-2008 period takes into account the ratio between the firms in the sample that distribute IOE in the period and the number of firms that distribute cash dividends. Table C1 shows that, in 1997, only 6.1% of the firms that distributed earnings in cash did so in the form of IOE. In that year, the remaining 94.9% of the sample distributed profits exclusively through dividends, thus losing out on the tax benefits provided by IOE.

Table C1
Analysis of the number of firms distributing earnings in cash

YEAR	ELIGIBLE (A)	CASH_DIST (B)	IOE (C)	(B) / (A)	(C) / (B)	(C) / (A)
1997	480	297	18	61.9%	6.1%	3.8%
1998	639	351	34	54.9%	9.7%	5.3%
1999	786	337	34	42.9%	10.1%	4.3%
2000	798	349	42	43.7%	12.0%	5.3%
2001	787	374	41	47.5%	11.0%	5.2%
2002	789	359	37	45.5%	10.3%	4.7%
2003	773	333	46	43.1%	13.8%	6.0%
2004	766	365	58	47.7%	15.9%	7.6%
2005	736	393	119	53.4%	30.3%	16.2%
2006	702	365	218	52.0%	59.7%	31.1%
2007	671	350	212	52.2%	60.6%	31.6%
2008	628	355	195	56.5%	54.9%	31.1%

Notes: The column "Eligible" represents the number of firms in the BM&F Bovespa eligible to pay interest on equity (IOE) each year, under existing law. "CASH_DIST" is the number of firms that distributed earnings in cash, irrespective of the form of distribution. "IOE" is the number of firms that distributed earnings in cash through IOE. The last three columns on the right show the proportions between these variables, so as to display both firm practices and the joint temporal evolution of these variables.

As shown in Table C1, throughout the series, a growing proportion of firms chose to distribute cash dividends by IOE, which shows that more and more firms took advantage of the tax benefits provided by this mechanism. As of 2006, this proportion exceeded 50%. This increase in the proportion of firms paying out earnings in this way gives rise to an improvement in management practices aimed at maximizing the value of the firm. There is also notable growth in the ratio of firms distributing IOE to the total number of firms eligible to do so, which did not necessarily pay cash dividends, from 1997 to 2008. As shown in Table 3, the percentage of firms that paid IOE in relation to the total number of eligible firms was 3.8% in 1997, rising to 31.1% in 2008.

Despite the visible increase over time, a substantial percentage of firms that distributed cash dividends did not use IOE, despite the clear tax advantages provided. We cannot explain this stylized fact from the viewpoint of the firm; in any case, distribution by IOE instead of by dividends reduces the firm's tax burden. Why, then, do so many firms distribute their profits through dividends and not by IOE? One explanation lies in the tax law, which establishes differential tax rates according to the legal nature of the beneficiaries. In practice, when there are deviations between the optimum outcome for the majority shareholder and the optimum outcome for the whole of the firm, the payout decision can lead to expropriation of minority shareholders, to the extent that their shares become worth less than their potential maximum value.

Figure C1 presents the evolution of IOE over the period of this study. In the 1997-2008 period, the average distribution of earnings in the form of IOE rose from 6% to 55%. Distribution through IOE became sizable only after 2005, and yet in 2008 approximately 45% of firms eligible for IOE payout still distributed profits exclusively through dividends.

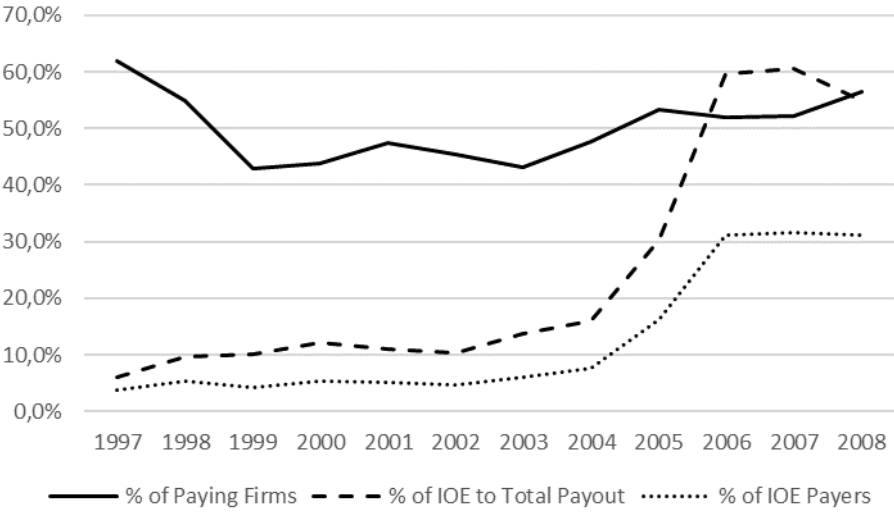

Figure C1. Evolution of IOE payouts, 1997-2008.

Appendix D

Complementary tables

Table D1

Description of variables and motivation for using control constructs

CONSTRUCT	DESCRIPTION	REFERENCES	THEORY AND MOTIVATION
IOE_BIN	Dummy that assumes the value "1" if the firm distributed IOE in the current year and "0" otherwise	-	EARNINGS DISTRIBUTION: The firms that use IOE the most to compensate shareholders are those with higher ratios of *IOE_TA*, *IOE_EPS*, *IOE_PAYOUT,* and *IOE_IOE**.
IOE_TA	Ratio between amount of IOE and total assets in the current year		
IOE_EPS	Ratio between amount of IOE and net profits in the current year		
IOE_PAYOUT	Ratio between amount of IOE and total earnings distributed in cash in the current year		
*IOE_IOE**	Ratio between amount of IOE and maximum allowed by law in the current year		
IND	Dummy that assumes the value "1" if the main controlling shareholder is an individual	Boulton et al. (2012), Brockman and Unlu (2009), Silva (2004), Truong and Heaney (2007)	OWNERSHIP STRUCTURE: Firms with a more concentrated ownership structure pay fewer dividends than those with less concentrated capital since greater free cash flow provides opportunities to expropriate minority shareholders.
CS2	Dummy that assumes the value "1" if the main controlling shareholder is a firm with up to two vertical levels before the ultimate individual shareholder		
CS3	Dummy that assumes the value "1" if the main controlling shareholder is a firm with up to three vertical levels before the ultimate individual shareholder		
FUNDS	Dummy that assumes the value "1" if the main controlling shareholder is an associative investment entity		
GOV	Dummy that assumes the value "1" if the main controlling shareholder is a government body or state-owned firm		
FUNDS_PART	Dummy that assumes the value "1" if there is any associative investment entity that holds 5% or more of voting capital		
VOTING_SHARES	Proportion of voting shares held by main controlling shareholder		
CONTROL_TOTALCAP	Ratio between share of voting capital and share of total capital maintained by controlling shareholders		
SIZE	Natural logarithm of total assets	Boulton et al. (2012), Brockman and Unlu (2009), Fama and French (2001), Mitton (2004)	SIZE: Firm size is positively related to the distribution of earnings in cash.
EBITDA_TA	Ratio between EBITDA and total assets in the current year	Brockman and Unlu (2009), Fama and French (2001), Ferreira, Nakamura, Martin and Bastos (2010), Mitton (2004), Truong and Heaney (2007)	PROFITABILITY: The more profitable the firm, the lower the tendency to need external financing, and the greater the tendency to distribute dividends in cash.
PROFITRES_TA	Ratio between total profit reserves plus accumulated profits and total assets in the previous year		
ROA	Ratio between current net profit and total assets at the beginning of the period		

Table D1
Continued...

CONSTRUCT	DESCRIPTION	REFERENCES	THEORY AND MOTIVATION
FINEXPENSES_TA	Ratio between financial expenses and total assets in the current year	Boulton et al. (2012), Brockman and Unlu (2009), Truong and Heaney (2007)	NON-EQUITY TAX SHIELDS: Firms that receive high non-equity tax shields tend to have lower or even zero benefits with payment by IOE.
DEPREC_TA	Ratio between total depreciation and amortization and total assets in the current year		
PREV_LOSSES	Dummy variable that assumes the value "1" if the firm has accumulated losses from prior fiscal years, and "0" otherwise		
ADR	Dummy that assumes the value "1" if the firm has ADRs (American Depositary Receipts) on the NYSE (New York Stock Exchange)	Boulton et al. (2012), Brockman and Unlu (2009), Mitton (2004), Truong and Heaney (2007)	CORPORATE GOVERNANCE: Better corporate governance leads to fewer agency problems, and therefore reduces the need to distribute dividends.
N2_NM	Dummy that assumes the value "1" if the firm is listed in Level 2 or the New Market of the BM&F Bovespa		
N1_N2_NM	Dummy that assumes the value "1" if the firm is listed at any level of corporate governance of the BM&F Bovespa		
MARKET_BOOK	Market-to-book ratio	Boulton et al (2012), Fama and French (2001), Ferreira, et al. (2010) Truong and Heaney (2007)	INVESTMENT OPPORTUNITIES: Distribution of dividends is inversely proportional to investment opportunities/growth.

Table D2

Composition by industry, means of dependent variables, and ownership structure

INDUSTRY (n=21)	NUMBER OF OBSERVATIONS				DEPENDENT VARIABLES					OWNERSHIP STRUCTURE							
	ASSET YEARS	%	FIRM YEARS	%	IOE BIN	IOE TA	IOE PAYOUT	IOE EPS	IOE IOE*	IND	CS2	CS3	FUNDS	GOV	FUNDS PART	VOTING SHARES (%)	CONTROL TOTALCAP
Finance and Insurance	491	11.79%	286	12.58%	0.33	0.00	0.10	0.27	0.22	0.10	0.22	0.31	0.06	0.28	0.15	67.69	1.38
Steel and Metals	456	10.95%	238	10.47%	0.31	0.01	0.07	0.22	0.21	0.08	0.15	0.61	0.09	0.00	0.23	62.98	1.65
Electrical Power	447	10.73%	237	10.42%	0.36	0.01	0.08	0.21	0.19	0.00	0.00	0.66	0.06	0.27	0.18	70.29	1.41
Textiles	293	7.03%	148	6.51%	0.06	0.00	0.02	0.05	0.05	0.31	0.34	0.20	0.00	0.00	0.18	51.69	1.60
Chemicals	292	7.01%	146	6.42%	0.19	0.00	0.04	0.11	0.10	0.00	0.21	0.73	0.00	0.06	0.18	70.22	1.69
Telecommunications	273	6.55%	137	6.02%	0.37	0.01	0.12	0.26	0.20	0.00	0.03	0.93	0.04	0.00	0.27	64.07	1.92
Food and Beverages	263	6.31%	138	6.07%	0.20	0.00	0.06	0.15	0.14	0.08	0.36	0.34	0.16	0.00	0.34	56.21	1.38
Business Management	251	6.02%	143	6.29%	0.17	0.00	0.04	0.13	0.11	0.18	0.45	0.18	0.07	0.00	0.30	54.41	1.58
Vehicles and Parts	201	4.82%	115	5.06%	0.17	0.00	0.05	0.12	0.15	0.25	0.16	0.39	0.16	0.00	0.68	54.87	1.61
Commerce	180	4.32%	106	4.66%	0.28	0.00	0.07	0.20	0.20	0.03	0.37	0.31	0.00	0.00	0.27	49.44	1.59
Others	155	3.72%	94	4.13%	0.19	0.00	0.06	0.16	0.15	0.45	0.14	0.09	0.06	0.18	0.12	56.70	1.66
Oil and Gas	122	2.93%	65	2.86%	0.23	0.00	0.05	0.17	0.17	0.00	0.48	0.22	0.00	0.20	0.48	43.93	1.77
Pulp and Paper	120	2.88%	64	2.81%	0.27	0.01	0.09	0.20	0.18	0.00	0.23	0.77	0.00	0.00	0.00	65.30	1.81
Manufacturing	118	2.83%	66	2.90%	0.13	0.00	0.03	0.06	0.09	0.12	0.25	0.62	0.00	0.00	0.19	75.76	1.54
Construction	114	2.74%	68	2.99%	0.02	0.00	0.00	0.01	0.01	0.50	0.19	0.07	0.00	0.00	0.11	45.58	1.25
Industrial Machines	97	2.33%	57	2.51%	0.39	0.01	0.09	0.21	0.18	0.00	0.22	0.53	0.00	0.00	0.22	65.92	1.72
Electronics	86	2.06%	50	2.20%	0.15	0.00	0.02	0.06	0.08	0.02	0.23	0.70	0.02	0.00	0.34	59.80	1.22
Non-Metal Minerals	72	1.73%	41	1.80%	0.14	0.00	0.03	0.06	0.07	0.00	0.32	0.35	0.15	0.00	0.31	52.29	1.21
Mining	68	1.63%	34	1.50%	0.63	0.01	0.17	0.56	0.31	0.00	0.21	0.64	0.15	0.00	0.15	54.38	1.61
Transportation	56	1.34%	35	1.54%	0.30	0.00	0.08	0.22	0.19	0.00	0.14	0.45	0.38	0.00	0.57	54.46	1.21
Agriculture and Fishing	11	0.26%	6	0.26%	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	77.16	1.48
Total	**4166**	**100.00%**	**2274**	**100.00%**	**0.25**	**0.00**	**0.07**	**0.18**	**0.16**	**0.10**	**0.22**	**0.47**	**0.06**	**0.08**	**0.24**	**60.95**	**1.56**

Note: This table shows the number of observations in the sample, segmented by industry, for the period from 1997 to 2008. The sample is composed of those firms that distributed cash dividends, through dividends, IOE, or a combination of both. The ASSETS column considers the number of observations per asset, in each industry, for the entire period. The FIRMS column restricts the maximum number of assets to one per firm. In addition to the composition of the sample by industry, the means of the dependent variables (*IOE_BIN*, *IOE_TA*, *IOE_PAYOUT*, *IOE_EPS*, and *IOE_IOE**) and ownership structure (*IND*, *CS1*, *CS2*, *FUNDS*, *GOV*, *FUNDS_PART*, *VOTING_SHARES*, and *CONTROL_TOTALCAP*) are presented for each of the 21 industries in the sample.

Table D3

Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
(1) IOE_IOE*	1.00																				
(2) IOE_BIN	0.84	1.00																			
(3) IOE_TA	0.91	0.81	1.00																		
(4) IOE_PAYOUT	0.73	0.87	0.74	1.00																	
(5) IOE_EPS	0.75	0.84	0.77	0.85	1.00																
(6) SIZE	0.28	0.36	0.25	0.32	0.32	1.00															
(7) EBITDA_TA	0.21	0.18	0.23	0.08	0.10	0.14	1.00														
(8) PROFITRES_TA	-0.07	-0.04	0.03	0.01	0.02	-0.15	0.03	1.00													
(9) FINEXPENSES_TA	-0.09	-0.11	-0.11	-0.11	-0.11	-0.05	-0.03	-0.23	1.00												
(10) DEPREC_TA	0.08	0.10	0.14	0.09	0.11	0.18	0.35	0.08	0.04	1.00											
(11) MARKET_BOOK	0.32	0.28	0.22	0.13	0.16	0.16	0.31	-0.13	0.02	0.04	1.00										
(12) ADR	0.19	0.27	0.24	0.28	0.29	0.54	0.14	0.12	-0.06	0.33	0.11	1.00									
(13) N2_NM	0.18	0.15	0.09	0.11	0.13	0.15	-0.04	-0.16	0.02	-0.11	0.27	-0.01	1.00								
(14) IND	0.00	-0.06	-0.03	-0.02	-0.03	-0.22	-0.15	0.01	0.00	-0.09	-0.06	-0.13	0.13	1.00							
(15) CS2	-0.13	-0.16	-0.13	-0.14	-0.14	-0.23	-0.14	0.14	-0.03	-0.17	-0.08	-0.20	-0.03	-0.18	1.00						
(16) CS3	0.07	0.11	0.07	0.06	0.07	0.25	0.26	-0.07	0.01	0.26	0.08	0.15	-0.17	-0.33	-0.57	1.00					
(17) GOV	0.07	0.15	0.13	0.17	0.14	0.28	-0.06	0.05	-0.08	-0.07	-0.05	0.29	0.01	-0.06	-0.10	-0.20	1.00				
(18) FUNDS	0.04	0.04	0.03	0.03	0.04	0.10	0.03	-0.12	0.04	0.00	0.10	0.08	0.18	-0.08	-0.14	-0.26	-0.05	1.00			
(19) FUNDS_PART	0.09	0.08	0.10	0.10	0.09	0.17	0.01	-0.03	0.02	-0.03	0.01	0.08	0.14	-0.02	0.09	-0.31	0.08	0.36	1.00		
(20) VOTING_SHARES	-0.04	-0.03	0.01	-0.04	-0.02	-0.05	0.02	0.03	-0.07	0.05	-0.03	-0.05	-0.22	-0.18	0.04	0.28	0.04	-0.17	-0.30	1.00	
(21) CONTROL_ TOTALCAP	0.06	0.08	0.04	0.10	0.05	0.09	-0.03	0.11	0.02	0.07	-0.04	0.16	-0.10	0.03	0.12	-0.08	-0.01	-0.04	0.01	-0.05	1.00

Note: This table shows the correlation matrix among the variables used in this study, from 1997 to 2008.

Table D4
Multicollinearity analysis (VIF)

Variable	VIF	SQRT VIF	Tolerance	R-Squared
SIZE	2.03	1.42	0.4935	0.5065
EBITDA_TA	1.51	1.23	0.6618	0.3382
PROFITRES_TA	2.22	1.49	0.4514	0.5486
FINEXPENSES_TA	1.82	1.35	0.5502	0.4498
DEPREC_TA	1.23	1.11	0.8117	0.1883
MARKET_BOOK	1.2	1.1	0.8326	0.1674
ADR	1.6	1.26	0.6254	0.3746
N2_NM	1.17	1.08	0.8512	0.1488
IND	2.28	1.51	0.4389	0.5611
CS2	3.42	1.85	0.2921	0.7079
CS3	4.75	2.18	0.2106	0.7894
GOV	1.86	1.36	0.5384	0.4616
FUNDS	1.98	1.41	0.5039	0.4961
FUNDS_PART	1.32	1.15	0.7568	0.2432
VOTING_SHARES	1.26	1.12	0.7905	0.2095
CONTROL_TOTALCAP	1.11	1.05	0.9006	0.0994
Mean VIF	1.92			

Table D5
Robustness checks – IOE distribution in subsamples, 1998-2004 and 2005-2008, probit and tobit models

VARIABLES	ESTIMATION METHOD AND PERIOD			
	1998-2004		2005-2008	
	PROBIT	TOBIT	PROBIT	TOBIT
CONSTANT	-474.368	-0.3692	-7.0397***	-0.0431***
	(-0.02)	(-0.05)	(-4.94)	(-3.55)
SIZE	1.9510***	0.0115***	0.3683***	0.0018**
	(5.07)	(6.18)	(3.79)	(2.14)
EBITDA_TA	14.4402***	0.1012***	3.7612***	0.0545***
	(3.65)	(5.63)	(3.07)	(5.13)
PROFITRES_TA	-5.2212**	-0.0081	17.907	0.0157
	(-2.02)	(-0.55)	(1.57)	(1.61)
DEPREC_TA	-175.555	-0.0135	18.644	0.0511***
	(-1.64)	(-0.21)	(0.93)	(3.20)
FINEXPENSES_TA	-8.3736**	-0.0117	-0.8185	-0.0137
	(-2.25)	(-0.64)	(-0.40)	(-0.80)
ADR	10.152	0.0046	-0.0980	0.0027
	(1.47)	(1.33)	(-0.28)	(0.85)

Note: This table presents the marginal effects of the probit and tobit panel data regressions for the periods 1998-2004 and 2005-2008, respectively. The dependent variables are IOE_BIN (for probit regressions) and IOE_IOE* (for tobit regressions). Year and sector dummies were inserted in the table in an attempt to capture the effects of period and sector on economic activity. The estimated coefficient and the z statistic (in parentheses) are reported for each variable.

Table D5
Continued...

VARIABLES	ESTIMATION METHOD AND PERIOD			
	1998-2004		2005-2008	
	PROBIT	TOBIT	PROBIT	TOBIT
N2_NM	152.037	0.0288	0.5888	0.0036
	(0.00)	(1.61)	(1.58)	(1.23)
MARKET_BOOK	0.5186***	0.0010	0.0148	-0.0000
	(3.28)	(1.34)	(0.27)	(-0.10)
IND	0.0000	-0.0558	0.4058	0.0046
	(.)	(-0.01)	(0.76)	(1.01)
CS2	15.387	0.0194*	-0.7982*	-0.0049
	(0.76)	(1.95)	(-1.70)	(-1.26)
CS3	16.641	0.0200***	-0.7780	-0.0049
	(0.99)	(2.94)	(-1.54)	(-1.16)
GOV	32.680	0.0350***	-0.2897	0.0000
	(1.48)	(3.05)	(-0.36)	(0.01)
FUNDS	11.065	0.0118	-0.5100	-0.0014
	(0.58)	(1.27)	(-0.91)	(-0.30)
FUNDS_PART	0.2365	0.0047	0.3148	0.0056**
	(0.32)	(0.97)	(1.15)	(2.33)
VOTING_SHARES	-0.0838	-0.0011	0.3685	0.0049
	(-0.07)	(-0.16)	(0.86)	(1.25)
CONTROL_TOTALCAP	0.8594**	0.0061**	0.2893*	0.0032**
	(2.08)	(2.34)	(1.82)	(2.28)
				Conclusion
Observations (n)	823	1254	774	779
Log likelihood	-156.17	422.88	-385.64	984.64
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes

Note: This table presents the marginal effects of the probit and tobit panel data regressions for the periods 1998-2004 and 2005-2008, respectively. The dependent variables are IOE_BIN (for probit regressions) and IOE_IOE* (for tobit regressions). Year and sector dummies were inserted in the table in an attempt to capture the effects of period and sector on economic activity. The estimated coefficient and the z statistic (in parentheses) are reported for each variable.

Table D6
Robustness checks – adding growth of EBITDA and current liquidity ratio as explanatory variables

VARIABLES	ESTIMATION METHOD							
	PROBIT				TOBIT			
	REG_1	REG_2	REG_3	REG_4	REG_5	REG_6	REG_7	REG_8
CONSTANT	-8.9072***	-6.2686***	-8.8124***	-5.8498***	-51.237	-1.9556***	-50.150	-1.7043***
	(-6.73)	(-6.12)	(-6.46)	(-5.36)	(-0.10)	(-5.13)	(-0.08)	(-4.20)

Note: same as Table 2, but adding the following additional explanatory variables: GROWTH_MGEBITA = growth in EBITDA margin (in percentage points); CURR_LIQ = current assets minus current liabilities. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Table D6
Continued...

VARIABLES	ESTIMATION METHOD							
	PROBIT				TOBIT			
	REG_1	REG_2	REG_3	REG_4	REG_5	REG_6	REG_7	REG_8
SIZE	0.3184***	0.2947***	0.3359***	0.3080***	0.1027***	0.0937***	0.1047***	0.0948***
	(4.97)	(4.53)	(4.97)	(4.50)	(4.17)	(3.77)	(4.02)	(3.61)
EBITDA_TA	2.0190**	1.6524*	2.0324**	1.6610*	1.0389***	0.9155***	1.1272***	1.0053***
	(2.41)	(1.83)	(2.27)	(1.71)	(3.49)	(2.85)	(3.54)	(2.93)
PROFITRES_TA	0.8885	0.9376	1.3105*	1.3750*	0.0277	0.0569	0.2197	0.2527
	(1.24)	(1.29)	(1.68)	(1.74)	(0.11)	(0.23)	(0.80)	(0.91)
DEPREC_TA	28.548	20.475	21.784	12.050	1.8539***	1.6954***	1.7274***	1.5156**
	(1.64)	(1.14)	(1.18)	(0.63)	(3.15)	(2.81)	(2.74)	(2.34)
FINEXPENSES_TA	-10.676	-11.660	-11.257	-13.506	-0.5144	-0.5674	-0.5646	-0.6508
	(-0.83)	(-0.90)	(-0.82)	(-0.98)	(-1.18)	(-1.29)	(-1.22)	(-1.40)
ADR	0.3587	0.3736	0.4517*	0.4577*	0.1149	0.1190	0.1499	0.1506
	(1.48)	(1.54)	(1.68)	(1.70)	(1.30)	(1.35)	(1.52)	(1.53)
N2_NM	0.6040**	0.5835**	0.4814	0.4600	0.2708***	0.2671***	0.2678***	0.2630***
	(2.10)	(2.02)	(1.59)	(1.51)	(2.89)	(2.85)	(2.69)	(2.64)
MARKET_BOOK	0.0916**	0.1045**	0.0699	0.0843*	0.0167	0.0205	0.0017	0.0059
	(2.24)	(2.49)	(1.55)	(1.82)	(1.18)	(1.42)	(0.10)	(0.37)
GROWTH_MGEBITDA		0.0048		0.0046		0.0016		0.0016
		(1.32)		(1.25)		(1.18)		(1.11)
CURR_LIQ			-0.0753	-0.1036			-0.0459	-0.0541*
			(-0.96)	(-1.29)			(-1.61)	(-1.87)
IND	0.5529	0.5552	0.4190	0.4253	0.2257*	0.2314*	0.1558	0.1611
	(1.43)	(1.40)	(1.05)	(1.04)	(1.65)	(1.67)	(1.09)	(1.11)
CS2	-0.1727	-0.2934	-0.3036	-0.4289	0.0322	0.0046	-0.0336	-0.0614
	(-0.55)	(-0.91)	(-0.91)	(-1.25)	(0.28)	(0.04)	(-0.27)	(-0.49)
CS3	0.1775	0.1255	0.2984	0.2528	0.1122	0.1065	0.1569	0.1541
	(0.56)	(0.39)	(0.88)	(0.73)	(0.98)	(0.92)	(1.27)	(1.24)
GOV	0.8725	0.8180	0.8196	0.7784	0.2541	0.2500	0.1773	0.1779
	(1.60)	(1.50)	(1.44)	(1.37)	(1.27)	(1.26)	(0.85)	(0.85)
FUNDS	-0.2300	-0.3087	-0.1539	-0.1948	0.0172	-0.0019	-0.0286	-0.0367
	(-0.60)	(-0.80)	(-0.36)	(-0.46)	(0.13)	(-0.01)	(-0.19)	(-0.24)
FUNDS_PART	0.3583*	0.3993**	0.3685*	0.4290**	0.1464**	0.1625**	0.1650**	0.1875**
	(1.80)	(1.98)	(1.80)	(2.06)	(1.96)	(2.16)	(2.10)	(2.38)
VOTING_SHARES	-0.2140	-0.1694	-0.3826	-0.3463	-0.0876	-0.0785	-0.1133	-0.1094
	(-0.69)	(-0.54)	(-1.14)	(-1.03)	(-0.76)	(-0.68)	(-0.91)	(-0.88)
CONTROL_TOTALCAP	0.4480***	0.4759***	0.5162***	0.5474***	0.1884***	0.1959***	0.2076***	0.2158***
	(4.16)	(4.34)	(4.33)	(4.50)	(4.77)	(4.91)	(4.82)	(4.95)
Obs.	2033	1943	1820	1734	2033	1943	1820	1734
Log Likelihood	-691.57	-679.34	-599.17	-586.96	-903.88	-891.94	-784.34	-772.77
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: same as Table 2, but adding the following additional explanatory variables: GROWTH_MGEBITA = growth in EBITDA margin (in percentage points); CURR_LIQ = current assets minus current liabilities. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Appendix E

Are the Core Findings of the Paper a Result of Endogeneity?

One of the typical econometric shortcomings of studies trying to estimate the partial effect of ownership structure – including identity – on some output (performance, dividends, etc.) is endogeneity (Lee, 2008). As pointed out by Roberts and Whited (2013), the first step in addressing endogeneity is to identify the problem – which variables are endogenous and why? In our particular case, if ownership identity is endogenously determined, estimates from an OLS regression will be inconsistent, leading to potentially misleading interpretations. For example, one could argue that dividend payments and ownership identity are jointly determined, and thus dividend payouts could also affect ownership structure (reverse causality).

Due to the potential effect of endogeneity on our empirical analysis, we perform some extra regressions considering ownership identity as potentially endogenous – lagged regressors, Heckman's two-step selection model, and matched samples.[1] For the sake of brevity, we report our strongest empirical result regarding ownership identity: the participation of investment entities with 5% or more of the voting shares (FUNDS_PART) increases both the likelihood and the amount an invested firm payouts as IOE. The results are reported in Table E1.

Table E1
Endogeneity analysis – Regressions considering omitted variables and selection biases, 1997-2008

	Probit - Lag(1)	Probit - Lag(2)	Tobit - Lag(1)	Tobit - Lag(2)	Heckman 2-Step	Matched Sample (1:1)	Matched Sample (1:5)
FUNDS_PART	0.4347**	0.5244**	0.1510**	0.1968**	0.6844**	0.0534**	0.0329*
	(2.17)	(2.44)	(2.03)	(2.55)	(2.33)	(2.03)	(1.76)
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Log-likelihood	-672.15	-633.16	-890.91	-841.17	-1567.7584	-82.17	-158.99
Observations	1981	1819	1981	1819	3149	807	1420

Note: This table presents the marginal effects of the regressions that consider ownership identity as potentially endogenous. Regressions run from 1997 to 2008. The dependent variables are IOE_BIN (for probit regressions) and IOE_IOE* (for tobit regressions). The estimated coefficient and the z statistic (in parentheses) are reported for each variable. Lag(#) stands for the number of the lag considered for the endogenous regressor. Heckman 2-step refers to the regressions that jointly determine dividend payout and ownership identity. Matched Sample (1:1 and 1:5) reports the results of tobit regressions for a matched sample (based on the propensity score matching), associating one treated firm to one and four control firms, respectively. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

As we can observe from Table E1 – which builds on the complete model specifications, including industry fixed effects, year fixed effects, firm-level controls, and ownership identity variables – the results are virtually unchanged considering different classes of models to deal with endogeneity. Taken together, the results from Table E1 corroborate with the notion that, because of the substantial tax advantages, firms with a large presence of investment entities in their voting shares use more IOE payments relative to regular dividends than an otherwise similar firm (corroborating with H1).

Finally, besides the empirical evidence previously presented in Table E1, we have one strong theoretical reason to believe that ownership identity affects payout policy, and not the other way around: ownership identity is very rigid in Brazil. There are several reasons for that. One is the development of the capital market itself, which is still small relative to the size of the national economy. Second, it is very costly and time-consuming to start a business in Brazil – according to the "Doing Business Report" (World Bank, 2020) the country is ranked 138 out of 190 countries. To test if these issues are identifiable in our data, we estimate the transition probabilities of ownership identity throughout our sample period, and we find that ownership structure is highly persistent (i.e., the legal nature of the controlling shareholder barely changes on a year-by-year basis). Thus, it is unlikely that investors adjust ownership identity in response to changes in market outcomes, which seems to be a characteristic that is common to emerging markets (Lee, 2008).

Appendix F

Additional Information regarding the propensity score matching (PSM) procedure

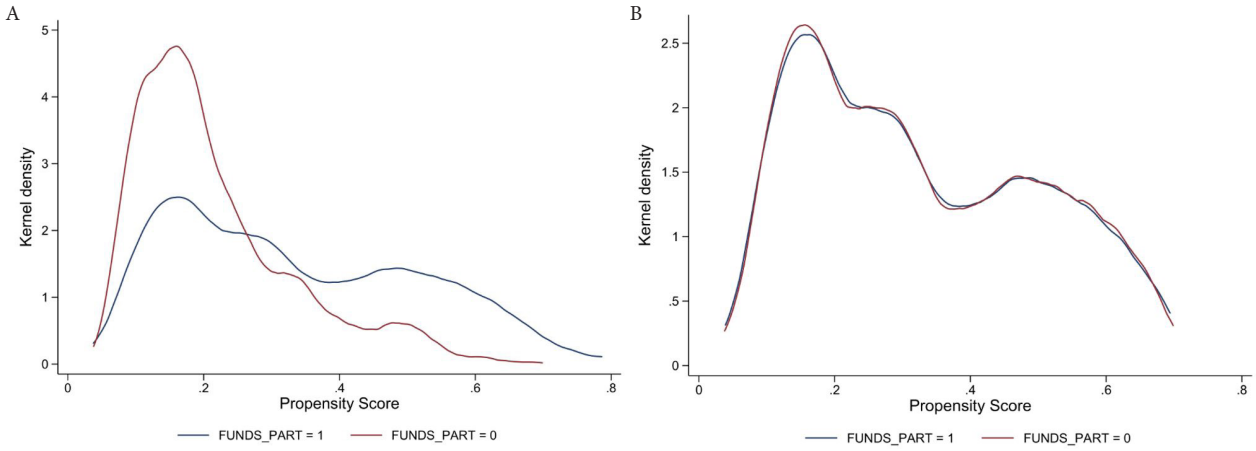

Figure F1. Kernel density of the propensity score before (A) and after (B) the matching

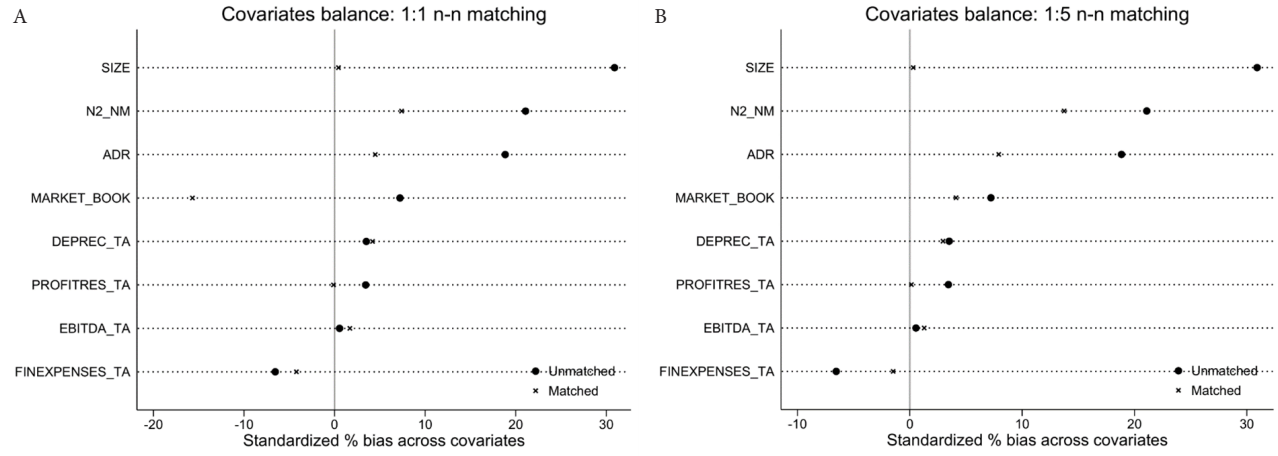

Figure F2. Covariate balance after matching – nearest neighbor 1:1 (A) and 1:5 (B)

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Plagiarism analysis:
RBGN performs plagiarism analysis on all its articles at the time of submission and after approval of the manuscript using the iThenticate tool.

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