Revisiting the Link Between Ownership Concentration and Financial Performance: Evidence from Brazilian Publicly Traded Companies

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Abstract

This paper provides two overriding contributions: a granular examination of Brazilian publicly traded companies' ownership structures and a thorough investigation of their relationship with performance. We rely on a dataset constructed by hand-collecting and organizing data from mandatory reports that listed companies filed with the capital markets regulator over the period from 2003 to 2013. Despite improvements in the institutional and regulatory framework as well as the great number of companies that went public over the sample period and were listed on the governance premium segments, we find that corporate ownership configuration barely changed in Brazil, preserving high levels of ownership and control concentration, the predominance of family control, and the widespread use of control-enhancing devices – through pyramidal ownership schemes, shareholders' agreements, issuance of non-voting shares, and board overrepresentation with directors mostly submissive to controlling shareholders. In addition, the estimation of a dynamic model with the dynamic system GMM panel estimator to address endogeneity concerns yields no evidence that companies' returns on assets appear to be systematically swayed by ownership and governance variables.

Introduction

Studies on the relationship between corporate ownership and performance have a long-standing tradition in the corporate finance literature. Until the 1980s, empirical research on that topic focused mostly on issues reflecting the US experience, notably the managers' agency conflict highlighted by Berle and Means (1932). Motivated to a great extent by several original contributions of La Porta, Lopez-de-Silanes, Shleifer and Vishny, the focal point shifted thereafter to the agency problem underlying controlling shareholders, purportedly endowed with power and incentives to expropriate minority investors. There followed a cornucopia of theoretical and empirical studies on the rationale and implications of "controlling-minority structures", as Bebchuk, Kraakman, and Triantis (2000) call the ownership arrangements prevailing across non-Anglo-Saxon countries that separate control (voting rights) from stakes in the overall capital (cash-flow rights). They argue that shareholders who reach control with a small capital stake in the company, on top of economizing on investment, also internalize only a paltry share of the agency costs entailed by corporate value-destroying decisions that provide them private benefits at the expense of minority shareholders (the expropriation hypothesis).

Almeida and Wolfenzon (2006) gave rise to another inflection point by modelling a theoretical interpretation of pyramidal ownership in family business groups as a response to financial constraints on investment into projects requiring large amounts of funding but with low pledgeable assets or cash flows. Notably in economies where the risk of expropriation of outside investors is high, pyramidal ownership could make viable a new company intensive in such sort of investments by providing "an internal capital market", through which an already established company transfers capital to the financially-constrained new company. Therefore, companies' characteristics regarding asset and cash flow pleadgeability would determine the ownership structure the controlling shareholder should choose. Almeida, Park, Subrahmanyam, and Wolfenzon (2011) as well as Masulis, Pham, and Zein (2011) provide empirical evidence consistent with Almeida and Wolfenzon's financing advantage hypothesis.

From the methodological viewpoint, empirical studies on corporate ownership until the 1980s neglected endogeneity issues and mostly relied on cross-sectional regressions. Subsequent research began to be attentive to endogeneity concerns by employing fixed effects estimator and instrumental variables. Nonetheless, either the validity of the instruments was questionable (company's size or idiosyncratic risk are likely correlated

with profitability or valuation of the companies) or types of endogeneity other than time-invariant unobserved heterogeneity were ignored.

In this paper, we begin by thoroughly examining the ownership and control structures of publicly traded companies listed on the Brazilian stock exchange over the period 2003-2013 and then we revisit the possible relationships of those structures with performance. For achieving this double intent, we built a dataset by hand-collecting data from reports that those companies have to file with Comissão de Valores Imobiliários (CVM), the Brazilian capital market watchdog. For each company, we traced the ownership chains linking the company to their largest ultimate shareholders. Compilation arranged the collected data according to criteria and procedures to fit the Brazilian corporate setting's peculiarities and our hypotheses evaluation.

Descriptive statistics drawn from this dataset allowed us to compose a detailed account of the Brazilian public companies' ownership and control structures over a period when economic and institutional changes took place and generated profound implications to the corporate governance standards. Nevertheless, we find the persistence of the same ownership profile reported by other studies analyzing previous periods: high ownership and control concentration, the widespread use of devices for separating voting and cash-flow rights, the predominance of family-controlled companies, and boards submissive to controlling shareholders. Turning to the possible effects of ownership and control structures on company performance, our results from estimating a battery of specifications for static and dynamic system-GMM estimator models do not support the expropriation hypothesis.

The remainder of this paper is divided into five sections. Section 1 outlines the main economic and institutional changes affecting Brazilian corporate governance over the last two decades, that is the scope for insiders' moral hazard and agency costs. Section 2 reviews the pertinent literature. Section 3 describes how the database was constructed and thoroughly examines the sample companies' ownership, control and governance characteristics. Section 4 formulates the hypotheses, lays out the methodological procedures followed to evaluate it, and discusses the estimation results. Finally, the last section summarizes our main findings and try to draw some policy implications.

1 Economic and Institutional Changes Affecting the Capital Market and Corporate Governance Setting in the Last Two Decades

At the end of the 1990s, the main Brazilian stock exchange, then called Bovespa and now B3, seemed to be in dire straits. [1] Poor legal protection of minority investors was aggravated by a toothless capital market regulator, high transaction costs (related to brokerage fees and a tax on every financial transaction), and the hard competition in the asset markets with government bonds, which provided at the same time high returns, low risk and near-money liquidity. In 1997, the Federal Government had reinforced controlling shareholders' power by revoking a corporate law clause that then mandated a public offer at the same price as that of the controlling block transfer for all ordinary shareholders (the tag-along provision). [2] Threats of changes favoring minority shareholders looming on discussions in the Congress lower house on the bill amending the corporate law triggered fierce resistance from controlling shareholders. Against this hostile backdrop to equity investment in the turn of the century, no wonder the growing delisting, the shrinking company valuations, scanty IPOs and seasoned equity offerings, and the low stock-trading volume in Bovespa, which increasingly lost trade to NYSE, where the largest Brazilian companies traded ADRs in search of valuation, lower external finance costs, and better bargaining power in international mergers and acquisitions.

Acknowledging both that poor legal investor protection was the major stumbling block impairing the equity market and that political economy factors obstructed legal changes that could improve the protection of their rights, Bovespa implemented in December 2000 three-tiered listing requirements. These special listing segments are subject to stricter governance rules than those mandated by law and observed by companies listed on the traditional segment. Joining any of the special segments is a private, voluntary contracting. The eligibility requirements to list on Novo Mercado is the most stringent, followed by Level 2, and then Level 1. By forcing companies to reveal how committed they are to the benchmark governance practices, this institutional innovation is certainly one of the main factors responsible for ushering in the resumption of IPOs and SEOs in 2004 and the overwhelming share of foreign investors.

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[1] In 2008, São Paulo Stock Exchange (Bovespa) merged with BM&F (a futures exchange) into BM&FBovespa, which in turn became B3 after acquiring CETIP, a settlement and clearinghouse, in 2017.

[2] Fiscally motivated, this reform allowed the Government to increase privatization proceeds. Unlike public share offerings, private negotiations of the controlling blocks entitled it to reap the control premia.

Besides the corporate law, companies listed on Level 1 were then subject to more stringent disclosure rules (concerning financial information, insiders' securities ownership and trading, and related party transactions), to keep a free float at a minimum of 25% of the shares outstanding, and to be committed to share dispersion in public offering. Level 2 further required tag-along rights in control transfers of 100% for common shares and of 80% for preferred shares, a compulsory public tender offer for at least the economic value in case of delisting or segment exit, membership to the market arbitration chamber, financial statements disclosed according to international standards, minimum of five members in the board of directors with at least 20% independent directors with a unified term of up to two years, and voting rights to preferred shareholders in case of mergers and spinoffs. Companies listed on Novo Mercado should comply with Level 2's requirements and issue only ordinary shares.

The implementation of Bovespa premium listing segments combined with institutional and policy changes conducted by the state and other initiatives led by private institutions and companies have greatly contributed to enhancing corporate governance in Brazil since 2000. The amendment of both the Corporate Law and the Securities Law has mitigated the traditional power imbalance favoring controlling shareholders. Act n. 10303 reforming the Corporate Law, enacted in October 2001, ensured minority shareholders the right to sell their common shares to the new controlling shareholder in control transfer events for at least 80% of the price per share s/he paid for, to nominate one director if their common shares reached at least 15% of the company's total capital, and to receive dividends for their non-voting shares. Importantly, the new act lowered companies' upper limit to issue non-voting shares from 66.6% to 50.0% of the total capital (binding only for new issuances) and rendered insider trading based on private information and market manipulations as "crimes against capital markets". The reform of the Securities Law governing securities issuance, holding, and trading as well as the regulator's attributions and power (Act n. 10411 as of February 2002) endowed the Brazilian capital market regulator (CVM) with large statutory independence, strengthening its autonomy at the administrative, operating, financial and budgetary levels. Act n. 11638, enacted in December 2007, has made mandatory the disclosure of financial statements for public companies in accordance with the International Financial Reporting Standards (IFRS), improving companies' transparency and information quality.

Since 2002, CVM has been much more proactive, taking important steps to enhance and enforce the regulatory framework. Besides creating a dedicated division to detect and investigate suspicions of irregularities and illicit behavior involving public companies and securities issuance and trading, CVM set forth two important measures in 2009: Instrução n. 480, which requires public companies to disclose a standardized form (Formulário de Referência) containing comprehensive and detailed information to the investors; and Instrução n. 481, which facilitates voting by proxy at shareholders' general meeting as well as dissident shareholders' initiatives.[3]

A number of studies have portrayed the corporate scene in Brazil at the beginning of the 2000s as dominated by companies controlled by a single family owning a high fraction of the overall and the voting capital, and generally relying on control-enhancing mechanisms, such as non-voting shares and pyramid schemes (Aldrighi and Mazzer, 2007; Valadares and Leal, 1999/2000). As pointed out in the next section, some authors relate voting power concentration and high discrepancies between voting and cash-flow rights to poor protection of investors. Bearing in mind that recent changes in the institutional framework regulating corporate governance seem to have restrained the scope for controlling shareholders' discretion, one can wonder whether these changes have rendered Brazilian public companies' ownership and control structures less concentrated. This issue is addressed in section 3, after the review of the pertinent literature in the next section.

2 Literature Review

There has been an enduring debate on the effect of ownership and control concentration on company valuation and performance. Consistent theoretical arguments can be found to sustain either a positive or a negative effect as well as no meaningful relation at all, ambiguity which empirical studies have failed to clear up. If we trace back to the origin of the debate, Berle and Means (1932) argued that the modern corporation's key characteristic feature – the separation between ownership, dispersed among many small shareholders, and control, held *de facto* by managers – provides management with discretion to extract private benefits from the company at the expense of shareholders,

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[3] For being outside the sample period, we do not examine the new rules for the premium listing segments that B3 implemented in 2014 and in 2018.

who contract and delegate power to managers who supposedly should owe fiduciary obligations to them. Undersupply of management monitoring, due to scattered shareholders' weak individual incentives, coupled with collective actions' coordination costs, the typical dilemma of public good provision, so they claimed, make it easier for managers to expropriate corporate wealth. Thus, managerial discretion could be curbed by ownership concentration, inasmuch as a large block shareholder wields power and incentives to monitor officers. Large shareholders' voting rights entitle them to affect companies' decisions either directly (when they are officers themselves) or by imposing management the actions they should take. Moreover, the concentration of their wealth in the company aligns their interest to profit maximization. Along the same lines, Jensen and Meckling (1976) argue that agency costs decline with the manager's capital stake: higher it is, stronger her incentives to behave in consonance with other shareholders' interest.

By contrast, Demsetz (1983) claims that ownership structures are not exogenous, but rather the result from shareholders' interests concerning risk diversification, liquidity, and returns as well as from observed and unobserved company characteristics (e.g. company size, the business riskiness, and the contracting environment), presenting no systematic relationship with company performance. Demsetz and Lehn (1985) vindicate his argument about ownership endogeneity by providing cross-sectional evidence from US corporations that diffuse ownership is neither statistically significant nor negatively related to company performance. Controlling for simultaneity bias, Demsetz and Villalonga (2001) find a similar result. Based on cross-sectional data of 371 large US companies for 1980, Morck, Shleifer and Vishny (1988) identify a non-linear relation between insider ownership and Tobin's q (and return on asset), interpreting it as the outcome of two opposing effects of large insider ownership: the incentive effect, which increases the company's market valuation as insiders' large capital stakes align their interests with other shareholders'; and the entrenchment effect, which reduces companies' market valuation because insiders' ownership concentration heightens discretionary power that induces to suboptimal decision-making.

In the 1990s, the empirical literature shifted focus towards the agency conflict between controlling and minority shareholders, which prevailed in most of the countries. The strong power and incentives that large individual shareholders have to push managers to maximize profit could also be exerted to extract private benefits of control at the expense

of minority shareholders, notably in countries with weak institutions where control-enhancing mechanisms are widespread. The ownership concentration's benefit of providing the public good of management monitoring also trades off with low share liquidity, shallow equity markets, companies' higher external finance costs owing to the higher perceived risks of expropriation from controlling shareholders with low portfolio diversification, and the impairment of other governance devices, such as submissive boards, low institutional investor activism, and the absence of a takeover market (Adams and Ferreira, 2008; Faccio, Lang, and Young, 2001; Gugler, Ivanova, and Zechmer, 2014; Wang and Shailer, 2015). Despite copious, this strand of the literature is far from consensual.

Dominant until the mid-2000s, the expropriation interpretation claims that one or a few shareholders set up controlling-minority structures to reach control by spending little capital investment: the implied large wedge between control and cash-flow rights allows them to externalize most of the costs of extracting private benefits of control to outside investors (Bebchuk, Kraakman, and Triantis, 2000; Morck, Wolfenzon and Yeung, 2005). Numerous studies provided empirical evidence then considered as supporting this view.[4] Negative correlations between performance measures and any factor that could potentially tip the balance of corporate power in favor of controlling shareholders were taken as further evidence supporting the expropriation hypothesis:[5] companies belonging to business groups; controlling shareholders being also CEO, chairman or a member of the board of directors; family or government control; low share of independent directors; or the absence of outside block shareholders. Cronqvist and Nilsson (2003) and Claessens et al. (2002) documented a higher valuation discount for family-controlled companies. Bianco and Casavola (1999) and Jon (2003) provide evidence of business group affiliation' adverse impact on company assets' returns. Whereas Claessens et al. (2002)

[4] La Porta, Lopes de Silanes and Shleifer (2002), Claessens et al. (2002) and Joh (2003) find that companies' market value or return on capital increases with controlling shareholders' cash-flow rights. Bianco and Casavola (1999) and Cronqvist and Nilsson (2003) show that return on assets and Tobin's q are negatively related to controlling shareholders' voting concentration, whose coefficient, however, lose statistical significance if cash flow rights are added as regressor. Claessens et al. (2002) and Joh (2003) observe a negative relationship between company performance and the discrepancy between voting rights and capital ownership. In addition, Joh (2003) presents evidence of non-linear effects of ownership on company performance, as Morck, Shleifer and Vishny (1988) do.

[5] On the mechanisms by which controlling shareholders manage to expropriate corporate wealth, see among others: Johnson et al. (2000); Bertrand, Mehta, and Mullainathan (2002); Morck, Wolfenzon, and Yeung (2005); Atanasov, Black, and Ciccotello (2011); Friedman, Johnson, and Mitton (2003); and Riyanto and Toolsema (2008).

find no meaningful relation between valuation and dummies for the distinct control-enhancing mechanisms, Villalonga and Amit (2006) show that the latter increases the risk of expropriating outside shareholders.

Subsequent studies dwelt on the distinct controlling-minority structures, especially on the motivation and implications of pyramidal ownership arrangements. Based on previous studies that had already emphasized pyramidal groups' potential for enhancing efficiency by filling institutional voids that entailed capital and labor market failures (Khanna and Palepu, 2000; Gomes, 2000; Khanna and Yafeh, 2005), Almeida and Wolfenzon (2006) formulate a theoretical model defying the expropriation view. They assign to family pyramidal business groups the advantage of diverting cash flows from existent group companies into new companies that otherwise would face financial constraint, as their investment requires large amounts of finance while they have low pledgeable assets and cash flows. Hence controlling families "select" new companies with those characteristics to be owned through pyramidal ownership, whereas they own directly companies facing no financial constraint. As the expropriation hypothesis, the financing advantage hypothesis also implies a negative relationship between pyramidal ownership and performance, but while the former contends that pyramids lead to lower performance, the alternative hypothesis argues instead that companies' different performance results from controlling families' choice: they select distinct types of companies to different positions in the pyramidal ownership structure, with less profitable companies being located at the bottom of the pyramid. The financing advantage of the pyramidal ownership structures would stem from their operation as internal capital markets.

Using data of Korean companies, Almeida et al. (2011) yield empirical evidence consistent with Almeida and Wolfenzon (2006). Controlling families own new companies with high financing needs and low pledgeable assets and cash flows through pyramidal ownership arrangements that locate those companies at the bottom of the business groups' structure. Masulis, Pham, and Zein (2011) find similar results relying on cross-country data: companies at the bottom of family pyramidal groups exhibit higher Tobin's q and investment rate, despite being smaller, younger, less transparent, and having higher idiosyncratic risk vis-à-vis those directly controlled or at their top. They also observe a lower valuation for group-affiliated companies that use control-enhancing mechanisms other than pyramids, such as dual-class shares. This is in line with Villalonga and Amit's (2009) findings: both pyramidal ownership and shareholders' agreements increase US

companies' valuation, which in turn is lower for companies relying on other enhancing-control mechanisms. Bena and Ortiz-Molina (2013) bring further support for Almeida and Wolfenzon's thesis with data of private and public companies from 38 European countries.

Although thorny endogeneity issues pervade the ownership-performance relationship, most of the studies until the 1990s either overlooked them – arguing that ownership patterns could be taken as exogenous as they change slowly over time – or dealt with them by using inappropriate instruments or by focusing on just one type of endogeneity and neglecting others. As Roberts and Whited (2007) underscore, studies in corporate finance, as a rule, rely on instruments related to companies' observed characteristics that are commonly employed as control variables in performance regressions, such as proxies for companies' size and idiosyncratic risk, thus failing to comply with the exclusion condition of no correlation with the performance variable. In addition, they rarely report if the relevance condition (correlation with the endogenous regressor) is met. Among the first to acknowledge that companies' insider ownership and value are both accounted for by common unobservable and observed characteristics and to use instrumental variables and controls for the time-invariant unobserved company heterogeneity, Himmelberg, Hubbard, and Palia (1999) find no significant impact of managerial ownership on companies' valuation.[6]

Addressing the simultaneity bias, Lins (2003) document that disproportionate managerial voting rights reduce companies' valuation, while Bhagat and Bolton (2008) show that firm performance is positively related to the median value of directors' shareholding and with non-chair CEO and diminishes with board independence. With data from Spanish companies, Pindado and de La Torre (2004) present evidence that the simultaneity bias is more responsible for the ownership endogeneity observed in value regressions than individual heterogeneity. As Demsetz and Lehn (1985), they also find that company size is pivotal to make ownership concentration endogenous. Reverse causality between company performance and the gap separating executives' voting and cash-flow rights could derive from executives increasing that gap to preserve its control when they anticipate a fall in the company's future cash flows (Lins, 2003). Omitted variables can

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[6] Following the same methodology, Leal and Carvalhal da Silva (2007), with a short panel data of Brazilian companies, and Gugler and Weigand (2003), with panel data of US companies, reach similar results. Zhou (2001) criticizes Himmelberg, Hubbard, and Palia (1999) on the grounds that, as ownership changes little over time within each company, fixed effects estimator has weak statistical power.

also lead to spurious inference, e.g. when a controlling shareholder facing financial constraint reacts to an adverse shock affecting the company by issuing additional shares and diluting consequently his/her stake (Cronqvist and Nilsson, 2003). Management compensation packages based on stock options are another example of how both ownership and company performance may result from third factors, in addition to be a channel whereby past performance may impact on the ownership structure (Bhagat and Bolton, 2008).

Causality claims underlying previous ownership-performance studies have been questioned in the last years. Besides Almeida et al. (2011), who document a selection effect in Korean family-owned business groups' pyramidal companies, Wintoki, Linck, and Netter (2012) find evidence that past realizations of company performance affect board characteristics (dynamic endogeneity) while the latter does not affect systematically current performance. Jiang et al. (2017) rely on three distinct estimators to address endogeneity issues in their regression estimations with data of Chinese listed companies: a propensity score matching, by which they analyze how differences in companies' observed characteristics influence different types of ownership structures and thus compares company performance among different types; fixed effects, to control for time-invariant unobserved company-specific variables that are correlated with both those variables; and a difference-in-differences estimator, to deal with reverse causality. Unlike Himmelberg, Hubbard, and Palia (1999), they document that companies owned by a single controlling shareholder other than the government present the lowest agency costs, followed by multiple large non-controlling shareholders (each holding at least 10% of the companies' outstanding shares), with single large non-controlling shareholders staying at the bottom of their proposed pecking order for ownership structure based on agency costs.

With respect to family control, theoretical arguments can underpin either positive or negative impacts on company performance. Commonly relying on control-enhancing devices to reach control in the companies wherein their wealth is concentrated, families may use the resulting disproportionate power to pursue their own private benefits to the detriment of other investors, implying inefficiencies and value–destruction, e.g. by nominating family members as executives or directors irrespective of competence, setting high compensation regardless of performance, self-dealing, and managing earnings (Bhaumik and Gregoriou, 2010). Nonetheless, concentrated ownership together with an enduring, transgenerational commitment to the companies' existence may strengthen

controlling families' incentives to maximize company value. Indeed, empirical studies provide mixed evidence, mostly explained by differences in ownership-control discrepancy size, governance structures, institutional backgrounds, and whether the family member is the founder. Based on a sample of Chilean companies, Torres, Bertina, and López-Iturriaga (2017) find that when family-controlled companies belong to business groups, the harmful effect on valuation of large discrepancies between control and ownership is mitigated, a result which they interpret as evidence of "the bright side of internal capital markets" favoring group-affiliated companies. By contrast, Bertrand et al. (2008) show that for the largest Thai business groups ownership and boards' membership of the founders' sons worsen company performance, probably due to disputes among descendants over corporate tunneling. Wang and Shailer (2015) and Wang and Shailer (2017) use meta-analysis techniques to investigate the ownership concentration-performance nexus in emerging markets for public companies as a whole and family companies, respectively. They document a negative relation between ownership concentration and performance for the former, whereas controlling families may create corporate value if their capital stake is moderate and investors' protection is reasonable.[7]

The impact of government ownership on company performance is an unsettled question, either theoretically or empirically, even controlling for countries' institutions and politics. Government-owned companies may underperform because they pursue social aims or are prey to predatory political interference that leads to corporate value-destroying decisions, inefficiencies, and corruption. As a case in point, Boubakri, Cosset and Guedhami (2005) document a negative impact of state ownership on companies' profitability and operating efficiency for a sample of 189 companies from 39 countries operating in strategic industries that were privatized over the period 1984-2002. By contrast, a soft budget constraint may favor government-owned companies' market valuation (Kornai, Maskin, and Roland, 2003). Boubakri et al. (2018) provide evidence supporting this view with data of East Asian publicly listed companies: government-owned companies' market valuation is higher than the other companies' provided that the government voting rights are lower than 50%.

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[7] For further evidence, see Cronqvist and Nilsson (2003) for Sweden; Villalonga and Amit (2006) and Anderson and Reeb (2003) for the United States; Bertrand et al. (2008) for Thailand; Cucculelli and Micucci (2008) for Italy; King and Santor (2008) for Canada; and Jameson, Prevost and Puthenpurackal (2014) for India.

This literature review regarding the relationships between ownership structures and company performance reveals that empirical findings are heterogeneous and non-inconclusive. Part of the divergence may be assigned to countries' institutional peculiarities and sampling characteristics (as time period, inclusion of private companies, exclusion of companies belonging to certain industries). Differences in definitions and choices of proxies for explanatory, control and dependent variables, in model specifications, as well as in the estimation methods are likely to be responsible for another relevant fraction of the evidence discrepancy. More specifically, endogeneity issues appear to be a key factor driving this empirical discordance while the methods to cope with them are far from clear (Wang and Shailer, 2015).

3 The Ownership Structure of Publicly-Traded Companies in Brazil over the Period 2003-2013

Source and Definitions

Before 2009, every public company was legally required to submit every year to CVM, Brazil's securities exchange commission, a report called "Informações Anuais" (IAN, Annual Information) that disclosed, for example, classes and number of shares outstanding as well as those of individual shareholders with at least 5% of the company's capital, boards' size and composition, and the existence of shareholders' agreement. In 2010, CVM substituted IAN with "Formulário de Referência" (FR, Reference Form), a more comprehensive, in-depth report that public companies have to disclose and update whenever further relevant changes come out. We draw primary data from these two sources for every public company for every year over the period 2003-2013, which allow us to reconstitute the direct and indirect ownership chains of the ultimate shareholders, to reckon their corresponding shares in total capital and voting capital, and to find the largest ultimate shareholder.[8]

The calculation of shareholders' shares in cash-flow rights and voting rights relies on some criteria and definitions. A shareholder holds indirect participation in the sample

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[8] We begin by identifying every sample company's direct shareholders; if they are other companies, we check their direct shareholders – therefore, the sample company's indirect shareholders. If this second tier's shareholders are also companies, we reiterate the procedure up to reach every ownership chain's ultimate shareholder. We then draw organograms representing the ownership structure for every company and year, wherein we insert the cash-flow rights and voting rights in every intermediate company along the ownership chains.

company's capital if she holds a stake in at least one intermediate company owning a direct stake in the sample company. Pyramidal ownership is indirect ownership wherein at least one intermediate company along the ownership chain is publicly traded.[9] A business group, which comprises legally independent companies under the control of the same entity, can be horizontal, when the controlling shareholder owns the affiliated companies directly or through a private holding, or pyramidal, when at least a publicly-traded company separates the shareholder from the other affiliated companies. A company's largest ultimate shareholder (LUS) owns the largest sum of direct and indirect shares in voting rights. Each LUS is classed into one of the following categories: family, shareholders' agreement (a contractual commitment of a group of shareholders to vote in a coordinated way), the various levels of government as well as entities they control, foreigners, mutual fund, pension fund, private company, co-operative or foundation. A shareholders' agreement is the LUS if none of its members owns individually more than 50% of the voting capital. As for Villalonga and Amit (2009), family LUS refers to an individual entrepreneur, shareholders with consanguinity ties, or usual partnerships of different families or entrepreneurs. Given LUS' high voting right concentration in most of Brazilian public companies, we define controlling shareholder as the shareholder owning at least 50% of the company's voting rights and, in the case of indirect ownership, if s/he owns at least 50% of the voting rights in every company along the ownership chain linking her/him to the sample company.[10]

The ultimate shareholder's participation in the company's cash-flow rights is calculated as the ratio of the common and preferred shares she owns over the company's shares outstanding when ownership is direct, and the product of her participation in the companies along the ownership chain, adding the products of these stakes if there are more than one ownership chain. A shareholder's participation in the company's voting

[9] Villalonga and Amit (2009) define "a company's ownership structure as a pyramid if the founding family holds its shares of the company indirectly, through one or more investment vehicles in which the family owns less than 100%." Paligorova and Xu (2012) define pyramids "as a collection or chain of listed companies having an ultimate owner at the top that controls the entire chain of companies.

[10] La Porta, Lopez-de-Silanes and Shleifer (1999) use voting right cutoffs of 10% and 20% to define control. Masulis, Pham, and Zein (2011) use the 20% cutoff but if the largest shareholder is the company's CEO, the chairman of the board, or the founder, the cutoff is reduced to 10% of the voting capital. Analysing Asian companies, Claessens et al. (2002) further adopt the 40% cutoff. Notwithstanding the predominance of these cutoffs in the literature, we opt for the 50% cutoff because it leaves little room for outside shareholders contesting controlling shareholder's decisions and the prevalence of Brazilian public companies with individual shareholders owning a very high share of voting rights (Chapelle and Szafarz, 2005).

rights is the ratio of her common shares over the common shares outstanding for direct ownership; for indirect ownership, when the LUS does not control the company his participation in the voting rights is calculated in the same way as for cash-flow rights, that is by multiplying the stake in the voting capital in the intermediate companies along each ownership chain and adding the corresponding products; if the LUS does control the company, her participation in voting rights is the first intermediate company's direct participation in the sample company's voting capital.[11] For companies that hold cross-ownerships, making each of them a shareholder of itself, a shareholder's participation in the voting or cash-flow rights of one of them is reckoned in relation to the number of shares not belonging to that company.[12]

Besides data on ownership data (such as LUS voting rights and cash-flow rights, percentage of non-voting shares in the shares outstanding, existence of indirect or pyramidal ownership, and LUS categories), we also compile data from CVM on board size and composition: number of directors, of non-executive directors, of directors nominated by the controlling shareholder, if the CEO is a director or the chairman, and the average number of boards on which the sample company's directors serve.

Accounting and financial data were drawn from the Standardized Financial Statements (Demonstrações Financeiras Padronizadas, which every public company is required to file with CVM) and Economatica, a financial data vendor company. Supplementary information was found on the websites of B3 (data on listing segments), Bank of New York Mellon (data on Brazilian companies' American depositary receipts), and public companies (foundation year and main business activity).

The Ownership Structure's Main Characteristic Features

The sample comprises all the public companies that submitted IAN or Reference Form over the period 2003-2013, totaling 3,899 year-companies and a number of companies

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[11] La Porta, Lopez-de-Silanes, and Shleifer (1999) and Claessens et al. (2002) define the ultimate shareholder's share in the company's voting shares outstanding as the sum of the lowest fraction of voting rights ("the weakest link") in each of the sample company's indirect ownership chains, with the clumsy implication that the sum can exceed 100%. See Faccio and Lang (2002).

[12] For the sake of illustration, when two companies, *A* and *B*, have the same cross-ownership of 40%, a shareholder holding a stake of α in *A* is entitled in fact to $\alpha/(1 - 0.4 \times 0.4)$ of *A*'s cash-flow and voting rights. See Masulis, Pham, and Zein (2011). Considered the host of peculiarities involved in calculating LUS participation in the sample company's voting rights and cash-flow rights, Appendix 1 reports the rules and procedures followed, which are illustrated by discussing the rather complex ownership structures of two companies.

ranging from 335 to 401 per year. As regards sectoral composition, companies in 2013 were concentrated in public utilities (15.2%), other services (12.5%), finance (11.3%), machinery, computers, electronic and electrical equipment (9.5%), and construction (6.8%). As compared with 2003, other services, agriculture, mining, construction, and oil, gas, and biofuel gained individual participation by more than 50%, while that of chemicals, telecommunication, and rubber and petrochemicals strongly shrank (see Appendix 2). The median company in 2013 was 40 years old (with 36% of the companies younger than 20 years), had market value and total assets of, respectively, R$ 1.63 billion and R$ 2.92 billion, return on asset of 5.91%, leverage of 60.1%, capital expenditures over total assets of 11.9%, and held 15.7% of the total assets in immobilized assets (Table 1). As Table 2 shows, near 37% of the companies in 2013 had gone public from 2003 on, most of which listed on Novo Mercado (83%). The number of companies in this premium listing segment jumped from 2 in 2003 to 134 in 2013, when it accounted for 40% of the listed companies, slightly below the traditional segment (43%).

Table 1
Descriptive statistics of accounting and financial variable (2013)

Variable	Obs.	Mean	Median	St. Dev.	Max	Min
Age	335	40.31	40	30.08	205	1
Asset	334	22.10	2.92	117.00	1300.00	0.00
Market value	299	7.92	1.63	26.30	271.00	0.00
ROA	307	0.03	0.06	0.25	0.87	-1.56
Leverage	335	1.62	0.60	11.07	187.93	0.01
CAPEX/Asset	319	0.15	0.12	0.65	5.76	-2.00
Tangibility	311	0.22	0.16	0.23	0.99	0.00

Source: Own elaboration with data from CVM and Economatica. Asset and market value in billions of reais; return on assets, leverage, CAPEX/Asset, and tangibility in value.

Table 2
Listing segments and IPOs: 2003-2010 (in %)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
IPO in 2003/13	0.3	2.3	4.4	11.8	25.2	27.2	29.7	30.3	33.8	34.3	36.9
IPO in 2003/13 if NM	0.0	71.4	64.7	73.3	82.4	80.2	78.9	77.9	78.2	77.0	76.9
NM if IPO in 2003/13	0.0	62.5	73.3	78.6	74.3	74.0	72.8	75.0	80.2	81.7	83.1
IPO in 2003/13 and NM	0.0	1.4	3.2	9.2	18.7	20.1	21.6	22.8	27.1	28.1	30.7
Trad	93.4	90.3	85.6	76.5	62.6	59.3	55.3	53.9	47.8	46.4	43.3
L1	5.2	6.0	7.0	7.0	9.0	9.1	9.8	9.8	10.8	10.5	10.1
L2	0.9	1.7	2.3	3.4	4.5	4.7	5.5	5.6	5.8	5.7	5.7
NM	0.6	2.0	5.0	12.6	22.7	25.1	27.4	29.2	34.7	36.5	40.0
N. of companies	348	352	341	357	401	383	347	356	343	335	336

Source: Own elaboration with data from CVM. Percentage in relation to the number of all sample companies or those listed on the Novo Mercado (NM). Trad, L1, and L2 stand for the traditional, Level 1, and Level 2 listing segments, respectively.

Families prevailed among the LUS' types of identity, representing 46% of the companies in 2013, followed by shareholders' agreements, whose share jumped 8 percentage points between 2003 and 2013 – from 15.8% to 23.8% (Table 3).13 The shares of foreigners and pension funds declined over the period (7.7 and 1.7 percentage points, respectively), while that of investment companies raised from 2.0% to 6.3%. Government share hovered at around 8%.

Table 3
Largest Ultimate Shareholder's Categories (in %)

LUS category	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2003/13
Sh. agreement	15.8	18.2	18.5	17.1	18.7	18.8	22.2	23.6	23.3	23.3	23.8	20.2
Government	8.3	8.0	7.9	8.4	7.7	7.8	7.8	7.6	7.9	8.4	8.9	8.1
Foreigners	18.1	17.9	15.8	15.4	12.7	11.7	11.5	10.7	10.5	9.9	10.4	13.2
Family	46.8	46.9	48.1	50.1	53.1	52.5	52.4	50.6	50.4	49.3	46.4	49.8
Mutual funds	2.0	2.3	0.6	2.0	1.7	3.1	3.2	3.4	4.1	5.1	6.3	3.0
Pension funds	2.3	1.7	1.8	1.7	1.5	1.6	1.2	1.1	0.9	0.9	0.6	1.4
Others	6.6	5.1	7.3	5.3	4.5	4.4	1.7	3.1	2.9	3.3	3.6	4.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	348	352	341	357	401	383	347	356	343	335	336	3,899

Source: Own elaboration with data from CVM.

As evidenced by Figure 1, the strong ownership and control concentration in the Brazilian corporate landscape observed in other studies for previous years persisted over that period (e.g. Aldrighi and Mazzer Neto, 2007; Valadares and Leal, 1999-2000). The average LUS held at least 66% of the voting rights and 46% of the cash-flow rights in every year over the period, implying an average wedge between these rights of 17 percentage points. Taking the 50% voting right cutoff to define control, almost 78% of the sample companies had a controlling shareholder in 2013, against 83% in 2003 (Table A2 in the appendix). In 2013, the LUS controlled more than 2/3 of the votes in 53% of the sample companies and at least 90% in 28% of them (Figure 2). Using lower cutoffs to define control, as did La Porta, Lopez-de-Silanes and Shleifer (1999) and Claessens et al. (2002), the fraction of "widely-held" companies becomes negligible. As Figure 3 shows, with the cutoffs of 10%, 20%, and 40%, companies with no controlling shareholder accounted for only 1.2%, 8.6%, and 17.6%, respectively, of the sample companies in 2013.

13 Shareholders' agreements, which usually impose on their members commitment to vote jointly and constraints on selling common shares to other investors, also gained importance in Italy when institutional reforms in the 1990s strengthened protection of minority investors' rights. This fostered coalitions between shareholders, notably banks, to substitute for pyramids as a mechanism to ensure control. See Bianchi and Bianco (2006), Bianchi, Bianco, and Enriques (2001) and Enriques and Volpin (2007).

Figure 1
Companies' Average LUS Voting and Cash-Flow Rights and Deviation of Rights
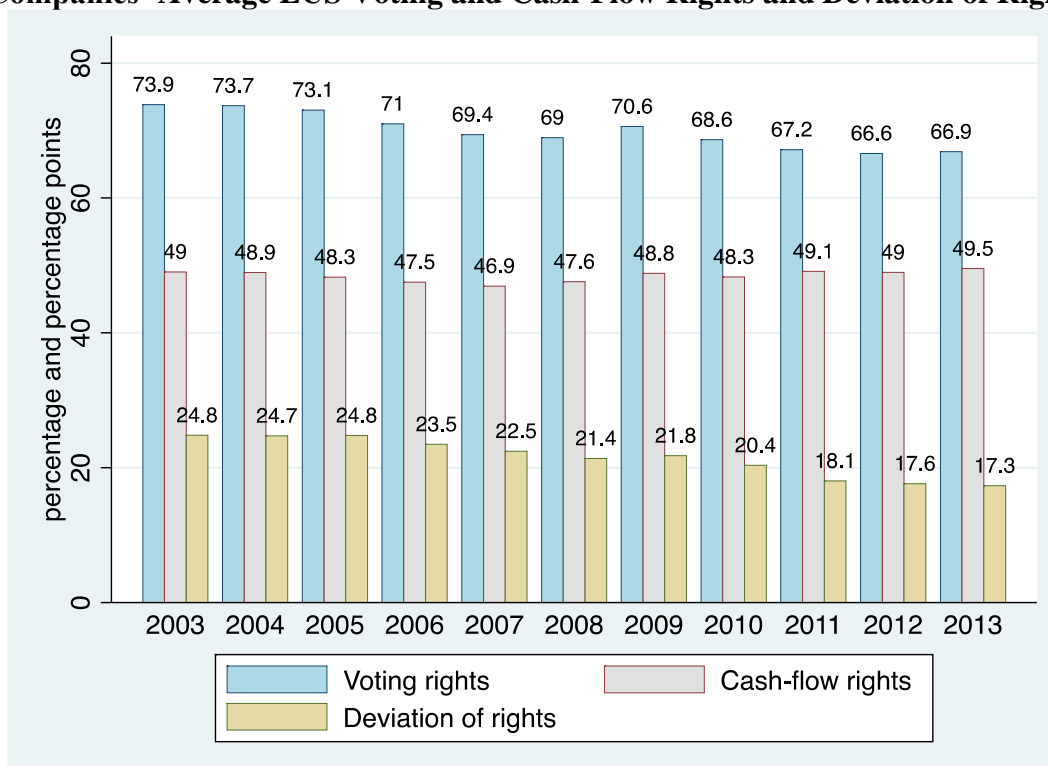
Source: Own elaboration with data from CVM. Voting rights and cash-flow rights measured in percentage and wedge in rights in percentage points.

Figure 2
Distribution of the Largest Ultimate Shareholders' Voting Rights (2013)
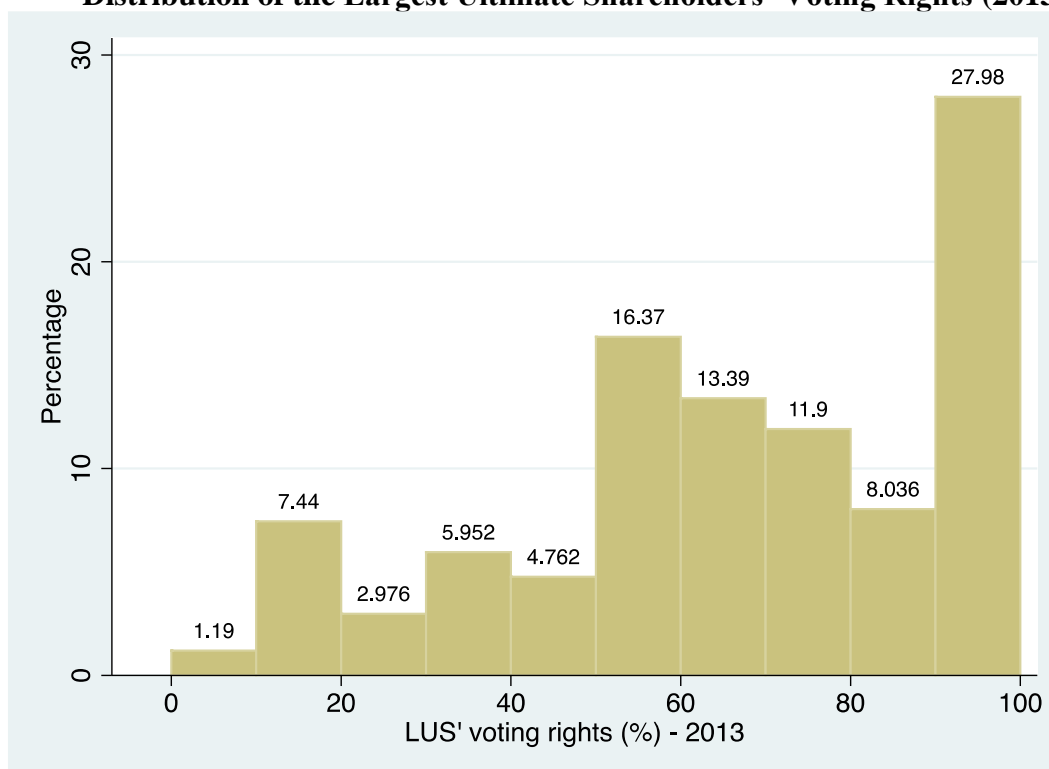
Source: Own elaboration with data from CVM.

Figure 3
Percentage of Companies with Controlling Shareholder: 10, 20, and 40% Cutoffs
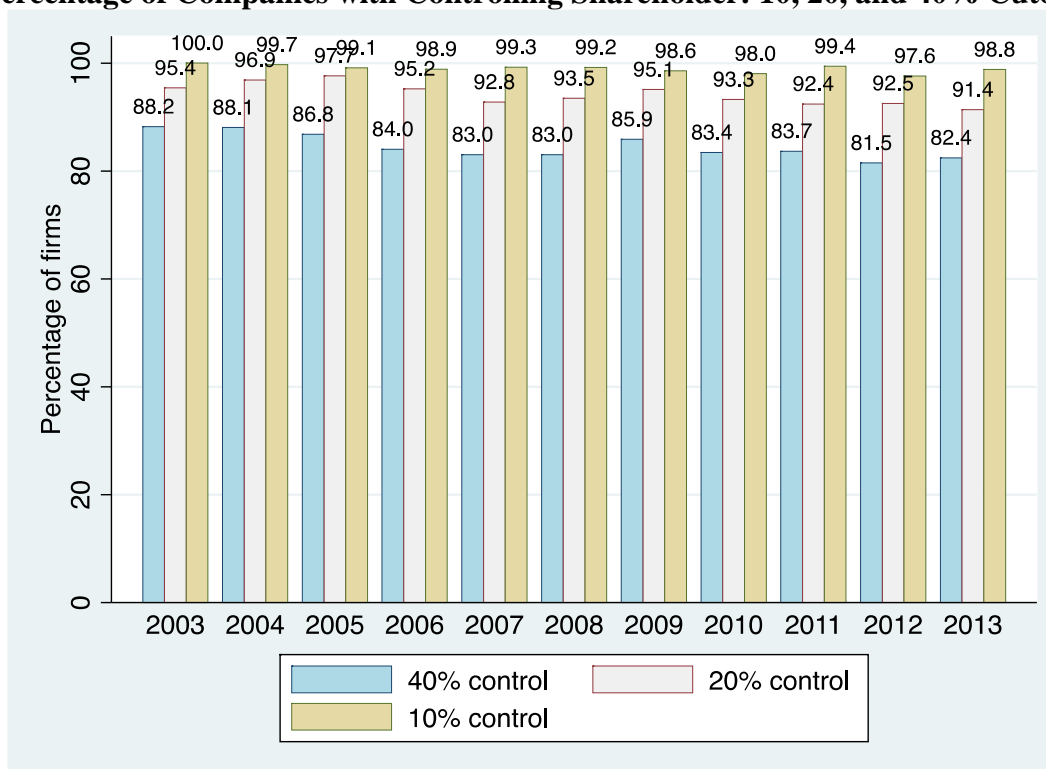
Source: Own elaboration with data from CVM. The company is considered as having a controlling shareholder if she owns 10, 20, or 40% of the voting rights.

Though relatively much lower, the concentration of LUS voting rights in companies listed on the Novo Mercado was nonetheless very high: the average voting power in 2013 was 46% and 56% of its 134 companies had a controlling shareholder (Table 4 and Figure A3). Shareholders' agreements (40 companies) and families (50 companies) were the categories of LUS with the highest voting right means (55.1% and 50.7%, respectively), while pension funds and investment companies (21 companies), with the lowest (19%).

Table 4
Average LUS Voting Rights According to the Listing Segment

year	Trad	L1	L2	NM
2003	74.2	69.1	78.0	58.9
2004	74.0	69.9	78.2	65.7
2005	74.0	70.7	85.0	53.8
2006	75.0	70.4	76.7	45.1
2007	75.9	75.5	77.1	46.8
2008	75.7	75.3	80.3	48.5
2009	79.3	76.8	82.8	48.2
2010	78.7	79.3	78.9	45.0
2011	78.4	79.8	79.6	45.7
2012	80.2	81.0	76.1	43.6
2013	81.2	80.1	76.6	46.4

Source: Own elaboration with data from CVM.

As compared with LUS voting rights, LUS cash-flow rights were lower and less concentrated around the right tail, even though in most of the companies they were sufficiently high to ensure control without resorting to enhancing-control mechanisms. Average LUS shares in the companies' cash-flow rights ranged from 47% to 49% over the period. In 2013, it averaged 49.5%, and the LUS owned at least a 50% stake in the capital of 52% of the companies (Figure 1 and Table 5, and also Figure A4 in the appendix). High shares of LUS cash-flow rights in the majority of the sample companies suggest that the main motivation underlying the widespread use of devices to separate control and cash-flow rights may rely on other reasons than minimizing investment to ensure control. Even for companies listed on the Novo Mercado, the share of the LUS in the company's total capital is considerably high – averaging 41.9% and exceeding a 50% stake in 52% of them in 2013. For companies whose the LUS was a family, the average share of the cash-flow rights (46%) is considerably lower than that for companies whose LUS was a governmental entity (63%), a foreigner (57%), and a shareholders' agreement (56%).[14]

Table 5
The Largest Ultimate Shareholder's Cash-Flow Rights (%)

year	mean	p25	p50	sd	max	min	N	cfr≥50%	NM
2003	49.0	25.8	45.5	27.9	100.0	1.2	348	45.1	55.3
2004	48.9	24.8	45.4	28.2	100.0	1.2	352	45.2	63.3
2005	48.3	25.2	43.7	27.4	100.0	0.0	341	43.4	50.3
2006	47.5	24.2	43.8	26.9	100.0	3.9	357	42.9	41.4
2007	46.9	23.9	44.5	26.1	100.0	6.2	401	45.4	43.0
2008	47.6	23.5	46.2	26.9	100.0	3.4	383	46.2	44.2
2009	48.8	24.4	50.1	26.3	100.0	4.5	347	50.4	43.5
2010	48.3	25.3	47.3	26.1	100.0	3.0	356	46.9	39.2
2011	49.1	28.2	50.1	24.9	100.0	4.6	343	50.4	40.8
2012	49.0	27.9	50.8	25.0	100.0	4.6	335	51.6	39.8
2013	49.5	30.3	50.7	24.8	100.0	4.1	336	52.1	41.9

Source: Own elaboration with data from CVM.
The columns show for every year the mean, the 25o. percentile, the median, the standard deviation, the maximum, the minimum, the number of observations, the percentage of the sample companies wherein the LUS cash-flow rights exceed 50%, and the average LUS cash-flow right for NM-listed companies.

Notwithstanding the high share of the LUS in the companies' total capital, the wedge between voting and cash-flow rights is also high, although tending to decline along the sample period. Around 37% of the sample companies presented a deviation of at least 20 percentage points in 2013, against 51% in 2003. Mean and median deviations felt from 24.8 and 20.8 in 2003 to 17.3 and 5.9 percentage points in 2013, respectively (Table 6),

[14] For the sake of space constraint, the table and figure supporting these remarks are not shown herein.

mostly due to companies going public or migrating to Novo Mercado. While the average deviation in companies listed on the Novo Mercado, the sole listing segment where companies cannot issue non-voting right shares, was just 4.6 percentage points in 2013, it reached 35 and 28 percentage points in companies listed on Level 1 and Level 2 (the segments where most of the largest companies are listed), which are higher than that in companies listed on the traditional segment (23 percentage points). The deviation was null in more than 81% of the 134 companies listed on the Novo Mercado in 2013. Considering the whole of the sample companies, those whose LUS were families presented average discrepancy between rights in 2013 higher than those whose LUS was a governmental entity, a foreigner, or a shareholders' agreement – 22.4, 17.1, 14.2, and 13.5 percentage points, respectively. Nonmetallic mineral (29.1 percentage points), chemical/petrochemical (26.8) and public utilities (24.6) were the industries with the highest average deviations. Average deviations were even higher in some industries in 2003, such as telecommunication (35.6 percentage points), mining (33.7), cellulose (32.4), and chemical/petrochemical (30.4). A great number of companies belonging to these sectors were privatized in the 1990s.

Table 6

The Wedge between the LUS' Voting Rights and Cash-Flow Rights

year	mean	p50	max	min	N	≥ 20	TRAD	L1	L2	NM
2003	24.8	20.8	91.7	-33.2	348	51.1	24.3	34.4	35.9	3.6
2004	24.7	20.2	94.9	-33.2	352	50.6	23.9	39.0	45.2	2.4
2005	24.8	21.9	92.1	-24.0	341	50.7	24.1	40.5	47.1	3.5
2006	23.5	17.3	93.0	-24.0	357	47.6	24.5	40.7	34.7	3.7
2007	22.5	15.1	93.8	-29.2	401	46.6	25.9	37.2	30.7	3.7
2008	21.4	12.1	93.1	-24.0	383	44.4	24.6	36.3	35.5	4.3
2009	21.8	14.5	93.1	-19.5	347	43.5	25.4	38.3	34.5	4.7
2010	20.4	12.8	93.0	-19.5	356	41.9	23.4	39.1	32.6	5.8
2011	18.1	10.1	85.2	-19.5	343	38.8	22.2	36.4	26.5	4.8
2012	17.6	7.5	89.2	-19.5	335	37.3	23.0	36.2	23.3	3.8
2013	17.3	5.9	89.2	-14.9	336	37.2	22.8	35.4	28.4	4.6

Source: Own elaboration with data from CVM.
Deviations measured in percentage points. The column "≥ 20" reports the percentage of companies wherein the deviation is at least 20 percentage points. The columns TRAD, L1, L2 and NM refer to the average deviation in the traditional segment, Level 1, Level 2, and Novo Mercado.

Discrepancies between LUS' voting and cash-flow rights can derive from non-voting share issuance, pyramidal ownership schemes, cross-shareholdings and/or shareholders' agreement. Until the beginnings of the 2000s, most of the Brazilian listed companies had a large fraction of their equity capital issued as non-voting right shares (PN class of shares): in 2003, more than 85% of the sample companies had issued PN shares, 53%

(36%) had at least 50% (60%) of the equity capital as non-voting shares, and 18% had issued up to the then legal upper limit of 2/3 of the company's capital (Table 7). Institutional changes (the corporate law reform in 2001 forbidding listed companies from issuing further non-voting shares exceeding 50% of their capital and the requirement that companies listed on the Novo Mercado should issue exclusively voting ordinary shares) shrank the importance of PN in the following years: the mean (median) fraction of non-voting shares fell from 42% (50%) in 2003 to 23% (0%) in 2013, when 51.5% of the sample companies had issued no PN shares, and the share of companies whose PN shares represented at least 50% (60%) of the total capital had fallen to 27% (18%) – in 2003 it was 53% (36%). Nonetheless, 27% of the companies in 2013 still had at least 50% of their capital as PN shares and 11% had reached the upper legal limit of 66% – implying that the LUS could gain control by acquiring just 17% of the capital (50% of the voting capital, which accounted for 1/3 of total capital). Family companies issued preferred shares in higher proportion than the others: 28.6% and 18.9% respectively in 2013. Furthermore, 34% of the family companies had issued non-voting shares representing at least 50% of the capital against only 27% of the others.

Table 7
Non-Voting (Preferred) Shares

year	mean	mean/fam	p50	N	pn>0	pn≥50	pn≥50/fam	pn≥60	pn≥66
2003	42.4	44.7	50.0	346	85.1	53.2	56.4	35.8	18.2
2004	40.8	43.9	50.0	350	81.8	50.9	53.9	33.7	18.6
2005	38.2	42.3	48.0	338	78.3	47.0	52.8	31.7	18.3
2006	33.7	38.3	43.0	353	69.5	41.9	49.4	27.8	15.3
2007	30.4	34.2	35.0	397	62.8	37.0	41.5	24.4	13.6
2008	29.8	33.7	31.0	380	61.4	38.4	44.5	24.7	13.7
2009	28.0	31.4	25.0	345	58.5	34.5	40.1	21.2	12.5
2010	25.9	29.7	11.0	355	55.1	31.3	37.2	20.6	11.8
2011	25.1	30.2	6.5	342	53.4	29.5	35.8	19.6	11.1
2012	24.7	29.8	3.0	333	51.0	29.1	35.8	19.2	11.1
2013	23.4	28.6	0.0	332	48.5	27.1	34.4	18.4	11.1

Source: Own elaboration with data from CVM.
Mean and mean/fam refers to the average percentage of shares issued as non-voting shares by the sample companies and by family companies, respectively; p50: the median; N: number of observations; pn>0: percentage of the sample companies that issued non-voting shares; pn≥50: percentage of the sample companies that issued at least 50% of their shares as non-voting shares; pn≥50/fam: percentage of the family-controlled companies that issued at least 50% of their shares as non-voting shares; pn≥60: percentage of the sample companies that issued at least 60% of their shares as non-voting shares; pn≥66: percentage of the sample companies that issued at least 66% of their shares as non-voting shares.

Pyramid-affiliated companies, i.e. companies owned indirectly through at least one intermediate listed company, comprised 18% of the sample companies in 2013. Compared with other companies, the average LUS voting rights for pyramidal companies were consistently higher, with the difference getting larger along the period, reaching

more than 13 percentage points in 2012 and in 2013 (Table 8). Concerning average LUS cash-flow rights, it was the other way around: they were higher for non-pyramidal companies, with the difference tending to diminish – from 12.6% in 2003 to 4.3% in 2013. Out of the 61 pyramidal companies in 2013, 28 (46%) had issued up to 10% of the capital as non-voting shares while this type of shares represented at least 50% of the capital in just 12 companies (Figure A5). The significant number of pyramidal companies that had issued no or a small fraction of PN shares runs counter the expropriation view, which suggests that pyramidal ownership should emerge only when the legal cap for issuing non-voting shares, the cheapest way to enhancing control, was achieved. Two additional findings also are at odds with that view: the LUS held more than 50% of the cash-flow rights in 22 pyramidal companies (36%) in 2013, and the wedge between rights was below 20 percentage points in 20 pyramidal companies (33%) – which implies that control could be achieved with the same wedge if the company had issued less than 40% of the capital as PN shares.

Table 8
Average Voting Rights, Cash-Flow Rights, and Deviation of Rights of the Largest Ultimate Shareholders for Pyramidally and Indirectly Owned Companies

			cfr (%)		vr (%)		dev (pps)	
year	obs	% P	P	NP	P	NP	P	NP
2003	349	20.6	39.1	51.7	74.0	73.9	34.8	22.3
2004	353	21.0	41.3	51.0	75.1	73.4	33.8	22.4
2005	342	21.9	43.6	50.0	76.2	72.6	32.6	22.7
2006	359	20.6	42.3	49.1	76.0	69.9	33.7	20.8
2007	402	19.7	37.6	49.4	73.9	68.4	36.3	19.0
2008	383	19.8	37.6	50.0	72.4	68.1	34.8	18.1
2009	347	20.5	38.5	51.5	76.7	69.0	38.1	17.6
2010	356	20.5	41.8	50.0	75.7	66.8	33.9	16.9
2011	343	18.4	43.2	50.5	75.7	65.3	32.5	14.8
2012	335	18.5	44.2	50.0	77.5	64.1	33.3	14.1
2013	336	18.2	46.0	50.3	78.1	64.4	32.1	14.1

Source: Own elaboration with data from CVM. obs: total number of companies; cfr: average cash-flow rights of companies' largest ultimate shareholder (LUS) in percentage; vr: average LUS voting rights in percentage; dev: average LUS deviation of rights in percentage points. % P: percentage of pyramidally-owned companies; P: pyramidally-owned companies; NP: non-pyramidally-owned companies.

In 2013, the sample pyramidal companies had predominantly a controlling shareholder (87% of them) and were concentrated in public utilities (31%), telecommunications (11%), and finance (11%). Almost 2/3 of the pyramidally-owned companies were listed on the traditional segment and 21% on the Novo Mercado, the same companies that had launched IPO over the period 2003-2013. Shareholders' agreements stood out among pyramidal companies' largest ultimate shareholders (47.5%), followed by families (37.7%) and governmental entities (9.8%). Thus, unlike the evidence of Enriques and

Volpin (2007) on the Italian experience, shareholders' agreements and pyramidal ownership in Brazil are complementary rather than substitute arrangements. Impeded from issuing non-voting shares, companies listed on the Novo Mercado could arguably rely on pyramidal schemes to leverage voting power. Nonetheless, only 13 (9.7%) of the 134 companies listed on the Novo Mercado in 2013 were pyramidally owned, with the LUS' average wedge between rights of 31.4 percentage points – high but similar to that for other listing segments' companies (32.3 percentage points).

Indirectly-owned companies, i.e. those wherein a shareholder owns an equity stake through intermediate companies that s/he may or may not entirely own, accounted for almost 73% of the sample companies in 2013 (Table 9). The average number of intermediate companies ranged from 2.4 to 2.9 from 2003 to 2013 and the number of companies with at least five intermediate companies separating them from the corresponding LUS increased from 28 in 2003 (11.0%) to 49 (18.4%) in 2010 and then decreased to 36 (14.8%) in 2013. In that year, there were six companies separated from the LUS through eight intermediate companies, six by nine intermediate companies, one by 11 and one with 12. For the 134 Novo Mercado-listed companies, 88 (65.7%) were indirectly owned, 13 of which with at least 5 intermediate companies.

Table 9
Indirectly-Owned Companies and Levels of Indirect Ownership

					cfr		vr		dev	
Year	Obs.	% I	Av.NI	Max.NI	InP	D	InP	D	InP	D
2003	348	73.0	2.4	12	49.4	56.0	75.2	71.4	25.8	15.4
2004	352	74.1	2.4	13	48.1	56.9	73.6	73.0	25.4	16.1
2005	341	75.1	2.5	8	48.4	53.3	73.9	69.9	25.5	16.6
2006	357	76.2	2.6	9	47.4	53.0	70.8	67.7	23.4	14.7
2007	401	75.1	2.7	15	48.7	50.8	70.2	64.4	21.5	13.6
2008	383	75.5	2.8	11	50.1	49.9	70.2	63.5	20.1	13.6
2009	347	78.1	2.8	12	52.2	49.5	71.5	62.4	19.3	12.9
2010	356	75.0	2.9	13	51.9	45.6	70.9	58.0	19.0	12.3
2011	343	76.1	2.6	11	51.8	47.2	67.6	59.5	15.8	12.3
2012	335	74.3	2.7	13	51.8	46.1	67.5	56.8	15.7	10.6
2013	336	72.9	2.8	12	51.4	48.0	67.8	57.4	16.4	9.3

Source: Own elaboration with data from CVM. Intermediate companies are those between the LUS and the sample company. obs: total number of companies; % I: percentage of indirectly-owned companies; Av.NI: average number of intermediate companies; Max.NI: maximum number of intermediate companies. cfr: average cash-flow rights of companies' largest ultimate shareholder (LUS) in percentage; vr: average LUS voting rights in percentage; dev: average LUS deviation of rights in percentage points. InP: indirectly but non-pyramidally-owned companies; D: directly-owned companies.

Compared with directly-owned companies, indirectly-owned companies not belonging to pyramidal schemes presented, on average, higher LUS voting rights as well as deviation of rights – 67.8% and 16.4 percentage points for the latter against 57.4% and 9.3

percentage points to the former in 2013, suggesting that these companies could rely on other types of enhancing-control mechanisms. Indirectly but non-pyramidally owned companies were concentrated in the tails of the distribution of companies according to the percentage of non-voting shares: whilst 53% of them had issued less than 10% of their overall capital as PN shares in 2013, 31% had more than 50% of the capital as PN shares.

Shareholders' agreements (ShAs) grew in importance along the period among the devices to leverage the LUS' voting power. Figure 4 documents that companies wherein control was reached through ShAs represented 23.8% of the sample in 2013 – an increase of 8 percentage points as regards 2003. For companies listed on the Novo Mercado, companies with a ShA as the LUS accounted for an even higher percentage – 29.9%, peaking at 33.7% in 2010. Companies with ShAs regardless of ensuring control or not also rocketed up: from 21.8% in 2003 to 37.3% in 2013. As Figure 5 shows, for companies whose control was achieved through ShAs, the LUS average cash-flow rights, voting rights, and deviations of rights were all high throughout the period: 55.8%, 69.3%, and 13.5 percentage points, respectively, in 2013.

Figure 4
Percentage of Companies with Shareholders' Agreement
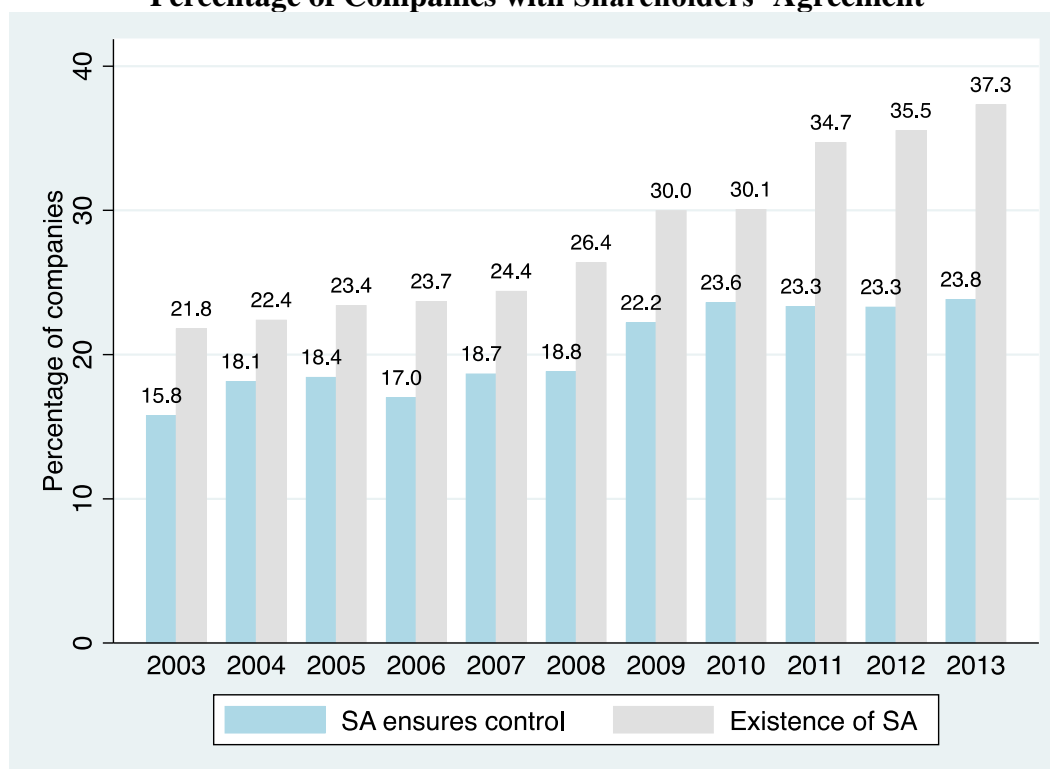
Own elaboration with data from CVM. Percentage of companies wherein shareholders' agreement ensures control and percentage of companies with shareholders' agreement.

Figure 5
**LUS' Average Voting Rights, Cash-Flow Rights, and Deviation of Rights in
Companies Reaching Control Via Shareholders' Agreement**
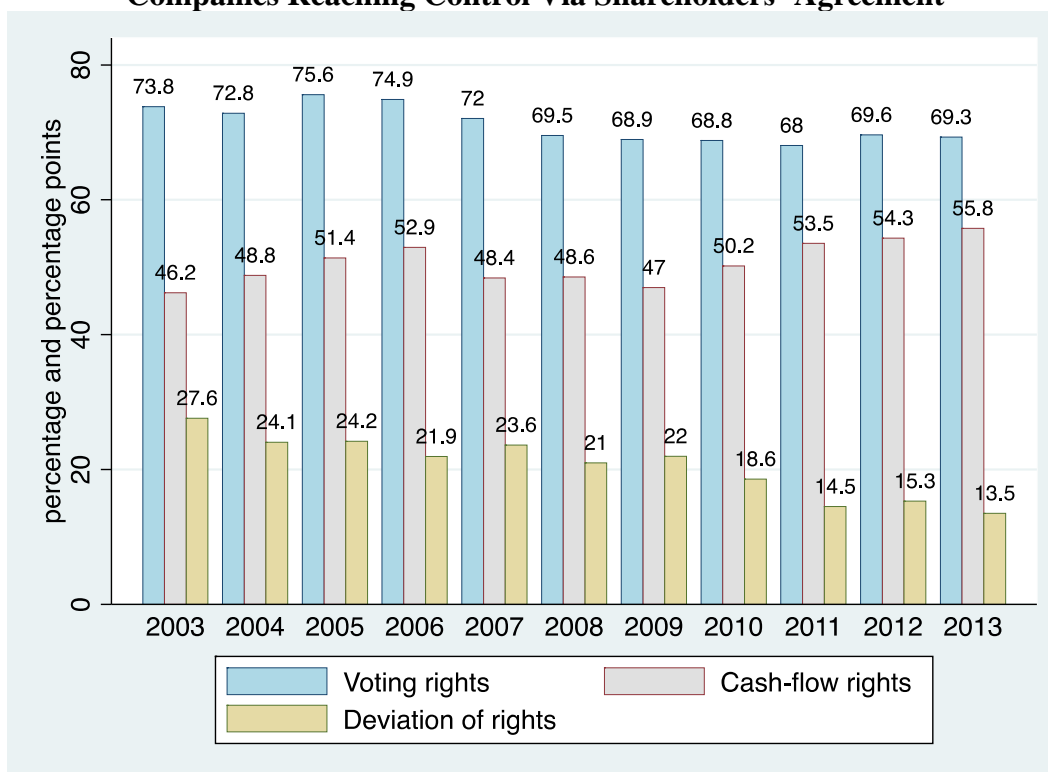
Source: Own elaboration with data from CVM.

Besides enhancing voting rights vis-à-vis their equity investment in the companies, controlling shareholders may lever even more power by representation in the boards of directors disproportionate to their voting rights. Villalonga and Amit (2009) measure LUS board overrepresentation as the difference between the share of directors the LUS nominates – and thus to whom they are submissive – and that of the LUS voting rights. As the Formulário de Referência (fields 12.6/8), and the IAN before 2010, releases information on the fraction of directors nominated by the controlling shareholder (and also on that of "outside or independent" directors, loosely defined as non-executive directors), we reckon the LUS board overrepresentation, which is shown in Table 10 together with other descriptive statistics for the companies' boards of directors. The average size of the boards of directors increased slightly over the period – from 6.2% to 6.9%. The share of companies with the CEO also being a director fell from 59.5% to 50.6% while that for those where the CEO and the chairman were the same person sharply shrank, from 29% to 15.5%, probably anticipating the upcoming requirement in May 2014 of the separation of the CEO and chairman roles for companies listed on Level 1,

Level 2 and Novo Mercado. As the shares of "outside and independent" directors (82.0% in 2013) and of directors nominated by the controlling shareholder (73.9%) were not very different, it is likely that information companies reported to CVM concerning the independence of their directors does not reflect the actual extent of the directors' autonomy. Moreover, the controlling shareholder nominated in 2013 at least 90% of the directors in 39.6% of the companies and less than 50% of them in only 14.6 of the companies. Being unlikely to defy those who awarded them such position, directors nominated by the controlling shareholder were bound to merely rubber-stamp her/his decisions, rendering the board of directors, the highest instance of authority within the company, submissive to the controlling shareholder's interests. Board overrepresentation was 7.5 percentage points in 2013, varying over the period from 5.1 to 8.6 percentage points. Its relatively low levels result from the high amount of the LUS voting rights. Nevertheless, the average overrepresentation in companies listed on the Novo Mercado achieved 18 percentage points in 2013, indicating that controlling shareholders, prevented from issuing non-voting shares, might be relying on board overrepresentation as a way to augment their corporate power.

Table 10
Boards of Directors' Structure: Size, Composition, and LUS Overrepresentation

year	size	ceo_ch	ceo_dir	ext_dir	contr_dir	over_repr
2003	6.2	29.0	59.5	82.5	79.0	5.1
2004	6.2	23.6	58.0	82.3	82.6	8.7
2005	6.2	24.0	56.6	83.1	82.2	9.2
2006	6.2	24.1	58.8	82.6	80.6	9.6
2007	6.4	24.4	59.9	82.7	77.6	8.4
2008	6.5	25.8	58.0	84.0	76.7	7.8
2009	6.6	27.7	56.8	82.8	79.0	9.0
2010	6.7	27.0	55.3	84.7	76.7	8.2
2011	6.9	21.9	55.1	85.9	76.3	9.3
2012	6.8	22.1	54.0	85.9	74.6	8.4
2013	6.9	15.5	50.6	82.0	73.9	7.5

Source: Own elaboration with data from CVM.
Size refers to the average number of the boards of directors (BDs); ceo_ch and ceo_dir stand for the percentage of companies whose CEO is a member or the chairman of the BD, respectively; ext_dir and contr_dir are the average percentages of outside directors and of directors nominated by the controlling shareholder; and over_repr stands for LUS board overrepresentation, measured as the difference between contr_dir and the LUS voting rights in percentage points.

The descriptive statistics presented above testify the persistence of the highly concentrated ownership and control structures in the Brazilian publicly-traded companies pointed out by other studies for former periods, despite the wave of IPOs in 2006 and 2007, notably of the companies that chose to list on the Novo Mercado, underpinned by

the institutional advances in corporate governance that took place at the beginnings of the 2000s. Brazil' corporate scene remains composed of companies whose LUS are mostly families that, notwithstanding their high equity stakes, rely on several devices to render their corporate power incontestable – pyramidal ownership, issuance of non-voting shares, shareholders' agreement, and board overrepresentation. The next section estimates an empirical model to examine if these ownership characteristics affect companies' performance.

4 Estimating the ownership-performance relationship

This section revisits the empirical relationship between companies' ownership characteristics and performance by using a novel ownership dataset for all non-financial publicly traded companies in Brazil over the period 2003-2013. Given the endogeneity issues permeating this relationship, which were highlighted in Section 2, we endeavor to tackle them by estimating a dynamic panel data model with the system GMM estimator. In the absence of valid and powerful external instruments and ownership-independent shocks over the sample period,[15] this estimator may contributing to isolate the impact on company performance from each of the potential endogenous ownership regressors. Blundell and Bond (1998) provide evidence that, for highly autoregressive time series and relatively small panel data, it entails lower finite sample bias as well as large efficiency gains as compared with the differenced estimator. Moreover, as Wintoki, Linck, and Netter (2012) emphasize, the system GMM estimator may control not only for time-invariant unobserved heterogeneity, as the fixed effects estimator does, but also for simultaneity bias and dynamic endogeneity between current ownership structure and past company performance, provided that some conditions are met.[16] Based on simulations with "representative" corporate finance datasets to compare the performance of the available estimators in dynamic panel model estimations, Flannery and Hankins (2013) conclude that the system GMM is "the best choice in the presence of endogeneity and even (surprisingly) second-order serial correlation if the dataset includes shorter

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[15] As pointed out by Roberts and Whited (2013), while corporate finance empirical models involve numerous potential endogenous regressors, reliable external instruments are overall scanty – such as natural events or features or institutional and policy changes orthogonal to the interest variable that function as quasi-natural experiments. See also Flannery and Hankins (2013).

[16] Dynamic endogeneity herein means that companies' past performance affects current ownership and governance characteristics. For example, company size may influence the ownership structure at the same it is influenced by past performance, linking therefore past performance to the current ownership structure.

panels", being "reliable regardless of the level of endogeneity or dependent variable persistence and should be the default choice under these conditions".[17] As they present evidence that "LSDVC is the most accurate estimator in the absence of endogenous independent variables and second-order serial correlation," we also employ for robustness check the least squares dummy variable correction estimator with lagged regressors (Bruno, 2005a; 2005b).

Our baseline dynamic empirical model takes the following general form:

$$y_{it} = \alpha + \gamma\, y_{i,t-1} + \mathbf{x'}_{it}\boldsymbol{\beta} + \eta_i + \varepsilon_{it} \qquad\qquad (1),$$

where y_{it} is the return on assets for company i (i= 1, 2, ..., N) in year t (t = 2003, 2004..., 2013),[18] $\mathbf{x}_{it}$ is a k×1 vector of k explanatory and control variables (referring to companies' ownership, governance, and other characteristics), $\boldsymbol{\beta}$ is a column vector of the k parameters to be estimated, η_i is the unobserved company fixed effects, and ε_{it} is the idiosyncratic error.[19]

We use the following explanatory variables in the performance regression: the share of the largest ultimate shareholder (LUS) in the company's cash-flow rights and voting rights; the gap between these rights; dummy variables for the existence of shareholders having several voting right thresholds (at least 10%, 20%, 40%, 50% or 66%); dummies for companies owned indirectly or through pyramidal schemes; the number of intermediate companies and of listed intermediate companies between the LUS and the sample company; the share of preferred shares in the company's shares outstanding; dummies for companies that issue preferred shares or in a proportion of at least 33%, 50%, or 66% of the shares outstanding; the number of shareholders directly holding at least 10% or 20% of the company's voting capital – the existence of multiple block holders as well as the size of their stakes affect the LUS behavior and strategies; dummies for LUS categories, such as family, state, foreign shareholders, and shareholders'

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[17] As ownership variables change very little over time within each company, fixed effects estimator has weak statistical power (Zhou, 2001). Blundell and Bond (1998) suggest that the system GMM estimator performs better with persistent data series than the first differencing estimators. On the advantages and limitation of the system GMM over its first-differenced counterpart, see Roodman (2009a, 2009b), Blundell and Bond (1998, 2000), Blundell, Bond and Windmeijer (2001), and Wintoki, Linck, and Netter (2012).

[18] We define y_{it} as the ratio of a company's net income in a given year plus financial expenditures less the corresponding tax shield to the total value of its assets. This measure mitigates the influence of companies' specific types of finance on their profitability.

[19] By estimating OLS regressions, we find that employing one lag of the dependent variable as a regressor is enough to incorporate the relevant past information on its dynamic interaction with ownership and governance variables.

agreements; a dummy for companies whose LUS is the Banco Nacional de Desenvolvimento Econômico e Social (BNDES) or a shareholder agreement in which BNDES takes part;[20] a dummy for the existence of a shareholders' agreement, regardless of implying control or not; dummies for the stock exchange segment on which the company was listed (traditional, L1, L2, or Novo Mercado); a dummy for companies that issued ADRs; dummies for board structure (size, percentage of outside members and of members nominated by the controlling shareholders, and CEO who was also the chairman or a member of the board); and board overrepresentation, measured by the excess of the share of directors nominated by the controlling shareholders over her share in the voting rights, as a proxy for voting power leverage at the boards (Table A3 lists the definitions of the covariates used in the empirical model).

As control variables, we employ companies' observable characteristics that the literature usually does, such as company age; company size (proxied by the natural log of total assets deflated to 2013 reais); dummies for industries; whether the IPO was recent (over the period 2003-2013); Tobin's q (the company market value plus long-term and short-term liabilities less circulating asset scaled by total assets); growth in net operating revenue (sales) in the former three years as proxies for companies' growth prospects; investment ratio, calculated as the ratio of capital expenditures (CAPEX) to the value of property, plant and equipment (PPE); financial leverage as a proxy for the financial structure, measured as a company's total liabilities over total assets; tangibility, the value of fixed assets scaled by the value of total assets; and market share, measured as the company's share in the corresponding industry net operating revenue for a given year, as a proxy for market power. A set of time (year) dummies are included in the regressions to control for business cycle effects (macroeconomic changes and/or general market conditions). Fixed industry effects and non-linear ownership effects were also controlled for.

Although the theoretical and empirical literature has profusely explored the relationships of these explanatory and control variables with companies' performance, there remain controversies or indeterminacy for some of them. As discussed before, the expropriation view, which led the research on that topic until the beginnings of the 2000s, emphasizes the close link between shareholder's power concentration and minority shareholders'

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[20] BNDES is the government-owned development bank, which until recently provided subsidized long-term credit as well as acquired large capital stakes in the largest Brazilian companies.

expropriation, claiming that characteristics potentially favoring insiders' moral hazard have a negative impact on company performance. We test a number of hypotheses entailed by the expropriation view. According to it, companies' returns and valuation tend to be positively associated with the LUS capital ownership (higher capital stakes would strengthen LUS incentives to maximize company's profit) and to decrease with the LUS share in the company's voting rights (high voting power would leave scope for entrenchment and inhibit outside investors from contesting) and with the disparity between LUS voting rights and cash-flow rights, as higher discrepancy reduces the capital investment required to reach control and thus gives rise to controlling minority structures, which lower the agency costs that controlling shareholders have to internalize as a result of value-destroying decisions and self-dealing (Bebchuk, Kraakman, and Triantis, 2000). That view also contends that all types of minority controlling structures (regardless whether through pyramids, dual-class shares etc.) aim solely to extract private benefits at the expense of outside shareholders. Differently, Villalonga and Amit (2009) find evidence for a sample of US companies that specific mechanisms to enhance control have different impacts: while dual-class shares and disproportionate board representation reduce company value, pyramids and shareholders' agreements have a positive impact. Almeida et al. (2011) and Masulis, Pham, and Zein (2011) show in addition that pyramidal arrangements owned by families contribute to mitigating companies' financial restrictions.

The number of shareholders directly owning at least 10% or 20% of the company's voting shares is a rough proxy for control contestability, as the LUS may be indirectly linked with them. With respect to the LUS categories, as pointed out in Section 2, theoretical arguments and empirical evidence are inconclusive. On the one hand, controlling families may strive to just enhance discretionary power and entrench themselves in the companies – e.g. by nominating themselves or submissive representatives as directors or managers, irrespective of expertise and qualification (Schulze, Lubatkin, and Dino, 2003; Morck and Yeung, 2003; Cronqvist and Nilsson, 2003). On the other hand, families' wealth concentration in the companies, at the cost of relinquishing liquidity and diversification benefits, together with their commitment to company intergenerational permanency may provide them high-power incentives to run companies efficiently (Anderson, Mansi, and Reeb, 2003). The effect of shareholders' agreements on company performance is also ambiguous: while their members may yield mutual monitoring and reduce agency costs

and coordination costs, they may also pursue self-benefiting coalitions at the expense of other investors. Empirical studies generally document that state ownership has a negative impact on firm performance, what is assigned to politically-motivated decision-making, corruption, and "soft budget constraint", while the effect of foreign ownership is viewed as positive as a result of more stringent governance regulation in the LUS origin countries.

Recent theoretical work modelling board structures as an efficient response to companies' characteristics and contractual constraints has been vindicated by empirical studies that, after controlling for endogeneity, find no systematic relationship between board variables and companies' returns or valuation.[21] In countries with institutional voids, controlling shareholders with voting rights far exceeding cash-flow rights might reach enough power to nominate self-servicing boards that merely rubber-stamp value-destroying decisions that increase their private benefits.

Regarding companies listed on the premium listing segments (Level 1, Level 2, and Novo Mercado), one could claim that better corporate governance standards in terms of transparency and investors' protection vis-à-vis those legally mandated would reduce companies' governance risks and thus their cost of capital, making them relatively more profitable.

As for company-level control variables, proxies for company size may capture monitoring by a greater number of analysts and rating agencies as well as better disclosure, both of which may lower agency and capital costs and increase share liquidity. Company's age and Tobin's q may be related to its growth opportunities. Leverage may affect profitability either negatively, via higher bankruptcy risks and financial constraints on profitable investment opportunities, or positively, through debt tax shields and lower agency costs of free cash flows – the disciplinary role Jensen (1986) attributes to debt. The impact of capital expenditures scaled by the value of property, plant, and equipment (PPE) is also ambiguous, as they may convey information on agency costs of free cash flows (overinvestment) or promising opportunities for profit and growth. Tangibility ratio proxies for asset pledgeability and access to credit, inasmuch as immobilized assets

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[21] For instance, in a context where independent directors face costly access to company's information, a CEO who also plays the role of a director or a chairman may facilitate the flow of relevant information to the board, contributing to attenuate mutual mistrust and render the strategic decision-making more efficient. Linck, Netter, and Yang (2008) and Wintoki, Linck, and Netter (2012) provide empirical support to the theoretical models and arguments of Hermalin and Weisbach (1998), Raheja (2005) and Harris and Raviv (2008). See the surveys of Adams, Hermalin, and Weisbach (2010) and Hermalin and Weisbach (2003).

exhibit low monitoring and verification costs and thus can serve as reliable collateral. Product market competition may refrain insiders from mismanagement but also limit markups. We also use a few interaction variables, such as those linking the dummy for family LUS with dual CEO-chairman roles, or the number of intermediate companies separating the LUS and the sample company with listing on the Novo Mercado – to verify whether in companies listed on that segment, which prevents the issuance of non-voting shares, the LUS would resort to indirect ownership or pyramidal schemes to facilitate tunneling and externalize the underlying costs, as the expropriation hypothesis claims.

Table 11 presents the correlation matrix for the financial/accounting variables.[22] Only the correlation coefficients of ROA with leverage (-43%) and of leverage with Tobin's q (39%) are higher than 20%. Concerning ownership or governance variables, Table 12 shows that the correlation coefficient with ROA of none of them complies with this criterion. As expected, LUS voting rights (*vr*), cash-flow rights (*cfr*) and deviations of rights (*dev*) are highly correlated with one another. Both *vr* and *cfr* are positively correlated with the fraction of the board's members nominated by the controlling shareholder (*contr_dir*), while only *vr* is positively correlated with the fraction of non-voting shares (*pn*) and the number of intermediate companies (*n_int*) and negatively correlated with being listed on the Novo Mercado (*NM*) and going public over the period 2003-2013 (*ipo*) – with *NM* and *ipo* being highly positively correlated with one another and both negatively correlated with *age*. Deviation (*dev*) is negatively correlated with *NM*, *ipo*, and the company age (*age*), while positively correlated with *pn*, being listed on Level 1 (*L1*), *n_int*, and the number of listed intermediate companies (*n_list*).

Table 11
Pairwise Correlation Matrix: Financial and Accounting Variables

	roa	q_tobin	ln_asset	ln_age	lev	capex
q_tobin	-0.0200					
ln_asset	**0.1939**	-0.1168				
ln_age	**0.0584**	-0.1146	**-0.1687**			
lev	**-0.4285**	**0.3861**	**-0.1218**	0.0668		
capex	0.0041	**0.0804**	-0.0080	**-0.0916**	-0.0202	
tang	**-0.0820**	-0.0046	**0.0995**	**0.0987**	**0.1132**	**-0.1137**

Data refer to non-financial companies. Table A3 in the appendix describes the variables. Figures in bold indicate that correlation is statistically significant at the 95% confidence level.

[22] In this section, we exclude financial companies from the sample, as they are subject to stricter regulations that can affect their operating performance and valuation.

Table 12
Spearman Correlation Matrix: ROA, Age, and Ownership and Governance Variables

	ROA	cfr	Vr	dev	int	L_int	pn	b_size	ceo_ch	ceo_dir	out_dir	contr_dir	fam	gov	SA	bndes	L1	NM	ipo
cfr	0.0062																		
vr	0.0053	**0.5404**																	
dev	-0.0237	**-0.3260**	**0.5398**																
n_int	**0.0722**	-0.0117	**0.2358**	**0.2914**															
n_list	**0.0905**	**-0.1758**	**0.1019**	**0.2663**	**0.4806**														
pn	-0.0148	**-0.1173**	**0.4331**	**0.6534**	0.0370	0.0453													
b_size	**0.1042**	**-0.0899**	**-0.0661**	0.0007	**0.1495**	**0.0972**	**-0.1183**												
ceo_ch	**-0.0637**	0.0154	**0.0590**	**0.0673**	-0.0419	-0.0134	**0.1316**	**-0.2722**											
ceo_dir	0.0088	**0.0500**	0.0388	0.0160	**-0.1030**	**-0.1279**	**0.0524**	**-0.1184**	**0.4949**										
out_dir	**0.0454**	**-0.0462**	-0.0216	-0.0112	**0.1024**	**0.1463**	**-0.0819**	**0.3695**	**-0.5184**	**-0.7538**									
contr_dir	**-0.0676**	**0.2366**	**0.2300**	**0.0775**	**0.1894**	**0.0766**	**0.1231**	**-0.1105**	0.0366	0.0134	**-0.0825**								
fam	**-0.1023**	**-0.1033**	0.0136	**0.1355**	0.0204	**-0.1161**	**0.1410**	**-0.2808**	**0.3003**	**0.1619**	**-0.2850**	**0.0492**							
gov	**-0.0940**	**0.0919**	**0.1160**	**0.0824**	**-0.1860**	0.0051	0.0147	**0.2366**	**-0.0787**	**0.1156**	**0.0790**	**-0.0853**	**-0.2719**						
ShA	**0.0670**	**0.0698**	**-0.0539**	**-0.0817**	**0.2524**	**0.2462**	**-0.1427**	**0.1752**	**-0.1580**	**-0.2201**	**0.2322**	**0.0812**	**-0.5307**	**-0.1432**					
bndes	-0.0024	**-0.0495**	0.0418	**0.1075**	**0.2422**	**0.2237**	0.0161	**0.1317**	-0.0514	-0.0215	**0.0813**	0.0019	**-0.2488**	**0.1606**	**0.3547**				
L1	0.0365	**-0.1294**	**0.1081**	**0.2768**	**0.0735**	0.0091	**0.2438**	**0.2367**	**-0.0841**	**-0.0760**	**0.1420**	-0.0330	0.0097	**0.1268**	-0.0374	0.0321			
NM	0.0174	**-0.0455**	**-0.4829**	**-0.5700**	**-0.1150**	**-0.1361**	**-0.6933**	**0.1322**	**-0.1236**	**-0.1083**	**0.1300**	**-0.1820**	**-0.0938**	**-0.1012**	**0.1474**	**-0.0850**	**-0.2025**		
ipo	-0.0139	0.0282	**-0.3177**	**-0.4348**	**-0.1006**	**-0.1239**	**-0.5475**	**0.0828**	**-0.0700**	**-0.0827**	**0.0915**	**-0.1167**	-0.0321	**-0.1199**	**-0.0785**	**-0.1860**	**0.7530**		
age	**0.0571**	**-0.0664**	**0.0778**	**0.2347**	**-0.0871**	**-0.0398**	**0.2630**	**-0.1726**	**0.1205**	**0.0913**	**-0.1293**	0.0125	**0.1835**	0.0063	**-0.1102**	**-0.0485**	**0.1007**	**-0.3728**	**-0.4410**

Data refer to non-financial companies. Table A3 in the appendix describes the variables. Figures in bold indicate that correlation is statistically significant at the 95% confidence level.

The variables *n_int* and *n_list* are highly correlated with one another and both positively correlated with shareholders' agreement as the LUS (*ShA*) and the company having BNDES as the LUS or as a member of the shareholders' agreement (*bndes*). The fraction of PN shares is positively correlated with *L1* and *age* (the largest companies are the oldest and tended to be listed on the Level 1) and highly negatively correlated with *ipo*. Regarding board variables, board size is negatively correlated with CEO who also was the company's chairman (*ceo_ch*) and family LUS (*fam*) and positively correlated with the fraction of outside directors (*out_dir*), government LUS (*gov*), and *L1*. CEO who was also one of the company's directors (*ceo_dir*) and *ceo_ch* are highly correlated with one another and both are highly negatively correlated with *out_dir*. While *ceo_ch* is very positively correlated with *fam*, *ceo_dir* is negatively correlated with *ShA*. Family as the LUS is negatively correlated with *out_dir*, while *ShA* is positively correlated with *out_dir* and *bndes*.

Table 13 displays the descriptive statistics of the ownership, governance, financial, and accounting variables for the sample non-financial companies. Overall, they are very similar to those for the whole sample: ownership and control were highly concentrated, control-enhancing mechanisms were widespread, families and shareholders' agreements predominated among the largest ultimate shareholders, and most of the companies were listed on the Novo Mercado and had gone public over the period 2003-2013. The distribution of accounting and financial variables is generally spread. The average company was large (total assets worth R$11.9 billion), leveraged (66%), invested 21% of its PPE, and with a Tobin's *q* close to 1.

We check for the persistence of companies' ownership and governance characteristics by reckoning the percentage of companies in which they changed significantly from year to year and over the whole sample period. Table A4 in the appendix shows that relevant variations happened in more than 20% of the companies in most of the years for the LUS' cash-flow and control rights and for board composition (the percentage of outside directors or of members nominated by the controlling shareholders), while they were less frequent (below 8% of the sample companies in most of the years) for being listed on the Novo Mercado, LUS pyramidal ownership, government LUS, and foreigner LUS. In between, changes in the existence of a controlling shareholder, indirect ownership, the fraction of non-voting shares, the accumulation of the roles of CEO and chairman or CEO and director, family LUS, and shareholders' agreement LUS ranged from 8.6% to 15.3%.

Even not being especially high, the magnitude of most of these time-series changes is adequate to estimate panel data regressions (for comparison, see Wintoki, Linck, and Netter, 2012).

Table 13
Descriptive Statistics of Ownership and Governance Variables – 2013

variable	N	mean	p50	sd	min	max
vr	246	0.621	0.629	0.262	0.055	1
cfr	246	0.458	0.462	0.225	0.046	1
dev	246	0.163	0.031	0.214	-0.149	0.852
pn	243	0.212	0	0.278	0	0.670
lus_control	245	0.727	1	0.447	0	1
d_pyr	246	0.134	0	0.342	0	1
n_list	246	0.175	0	0.484	0	3
d_io	246	0.748	1	0.435	0	1
n_int	244	2.012	1.5	2.130	0	12
ShA	246	0.232	0	0.423	0.0	1
gov	246	0.065	0	0.247	0.0	1
fgn	246	0.114	0	0.318	0.0	1
fam	246	0.480	0	0.501	0.0	1
inv_comp	246	0.069	0	0.254	0.0	1
bndes	246	0.073	0	0.261	0.0	1
ceo_ch	246	0.142	0	0.350	0.0	1
ceo_dir	246	0.488	0	0.501	0.0	1
b_size	241	7.257	7	2.431	3	15
ext_dir	241	0.823	0.830	0.124	0.330	1
contr_dir	239	0.714	0.800	0.334	0	1
b_overrepr	239	0.097	0.073	0.309	-0.956	0.898
trad	246	0.358	0	0.480	0	1
L1	246	0.089	0	0.286	0	1
L2	246	0.053	0	0.224	0	1
NM	246	0.488	0	0.501	0	1
d_pn50	243	0.259	0	0.439	0	1
d_pn33	243	0.342	0	0.475	0	1
ipo	246	0.415	0	0.494	0	1
age	245	38.9	34	28.8	1	123
roa	246	0.050	0.060	0.157	-1.399	0.355
ln_asset	246	14.758	14.920	1.694	9.673	20.440
lev	246	0.659	0.571	0.486	0.070	4.027
tobin_q	246	1.075	0.803	0.967	0.003	7.747
tang	246	0.250	0.217	0.221	0.000	0.897
capex	244	0.208	0.139	0.636	-1.999	5.760
mk_share	246	0.066	0.022	0.125	0.000	0.954

Source: Own elaboration with data from CVM. Data refer to non-financial companies. Table A3 in the appendix describes the variables. The variables roa, market share, leverage, tangibility, and capex are expressed as ratios, and assets in thousand reais. The columns show the number of observations, the mean, the median, the standard deviation, the maximum, and the minimum.

To test whether companies' past performance and characteristics influence their current ownership structures and characteristics, we regress some of the latter on the past values of companies' performance and characteristics. We find that total asset, leverage, Tobin's *q* and tangibility are all correlated with the lagged values of companies' performance and other characteristics, while ownership variables are correlated with the lagged values of

other ownership variables and characteristics.[23] These findings point to the potential endogeneity of the explanatory (ownership) and control variables. Furthermore, we follow Wooldridge (2010, p. 324-5) and Grieser and Hadlock (2019) and test the strict exogeneity assumption that the current values of the explanatory ownership and control variables are independent of the past values of the company performance (the condition of no feedback underlying the FE estimator) by carrying out a fixed effects estimation of the baseline regression (1) augmented by future values ($t + 1$) of those variables:

$$y_{it} = \mathbf{x'}_{it}\boldsymbol{\beta} + \mathbf{w'}_{i,t+1}\boldsymbol{\delta} + \eta_i + \varepsilon_{it}, t = 1, 2, \ldots, T - 1 \qquad (2),$$

where $\mathbf{w}_{i,t+1}$ is a subset of future values of the ownership and control variables ($\mathbf{x}_{i,t+1}$). Under the null hypothesis of strict exogeneity, the coefficients of the lead variables, $\boldsymbol{\delta}$, should be 0.[24] In most of the specifications, the coefficients of the future values of some ownership and governance variables are different from zero (Table A5 in the appendix), indicating that they are not strictly exogenous and that the feedback between the explanatory and dependent variables should be dealt with IV procedures.

To identify the number of lags of the dependent variable (company performance) to include as a regressor, we estimate an OLS regression of its current value (y_t) on variables related to companies' characteristics (size, age, tangibility, Tobin's q, leverage, and capex) as well as to different combinations of the dependent variable' lags (y_{t-1}; y_{t-2}; y_{t-1} and y_{t-2}; y_{t-1}, y_{t-2}, and y_{t-3}; y_{t-1}, y_{t-2}, y_{t-3}, and y_{t-4}). Only when the first lagged dependent variable is the sole regressor other than the control variables is the coefficient of the lagged performance statistically significant, suggesting that one lag is enough to convey

[23] Companies' total assets are correlated with the lagged values of ROA, age, Tobin's q, and tangibility; leverage with the lagged values of ROA, age, and tangibility; Tobin's q, with the lagged values of ROA, age, and leverage; tangibility, with the lagged values of ROA, total assets, age, leverage, and capex. Concerning ownership variables, companies' LUS voting right is correlated with the lagged values of itself, of the LUS cash-flow right, of the fraction of non-voting shares, of the number of intermediate companies, and of the dummy for Novo Mercado, while the number of intermediate companies is correlated with the lagged values of itself, of total assets, and of the dummies for family control and for Novo Mercado. To economize on space, we do not present the table with these results.

[24] Strictly exogenous variables are uncorrelated with past, present, and future values of the unpredictable errors. Endogenous variables are potentially correlated with past and contemporaneous errors. Predetermined variables are determined before the current period, being predetermined therefore relative to the time-varying errors (sequential exogeneity), implying that they are uncorrelated with current and future values of the errors but may be correlated with their lagged values. Thus, given the current and past values of the predetermined regressors, the expectation of the error term (unpredictable errors) should be zero.

information related to past performance persistence.[25] Hence, we employ the first lagged dependent variable as a regressor in all specifications.

To curb instrument proliferation, which could overfit the instrumented variables and thus lead to biased estimates and efficiency loss, we restrict the number of lags used as instruments (just the 2nd, 3rd, and 4th lags of the endogenous variables for first differences equation and their first-lag differences for the equation in levels) and also collapse them – that is, we employ one instrument for each variable and lag distance for all the time periods (Roodman, 2009a).

Our baseline regression includes as control variables the natural logarithm of total assets, of the company's age, and of Tobin's q, leverage, tangibility, and CAPEX over total assets (Wang and Shailer, 2015); and as explanatory variables the LUS voting rights and cash-flow rights, the number of intermediate companies between the sample company and the LUS, the fraction of non-voting shares, dummies for family control, dual CEO-chairman roles, and being listed on the Novo Mercado, and the variables interacting indirect ownership with listing on the Novo Mercado (to check whether Novo Mercado-listed companies resort to indirect ownership as a way to reach control) and family control with CEO-chairman, who in family companies might either have high-powered incentives and expertise to make the company efficient or use discretionary power to entrench herself. As do Wintoki, Linck, and Netter (2012), we estimate the performance equation by using a dynamic panel system-GMM estimator, besides static models with OLS and FE estimators and a dynamic model with OLS estimator.

Table 14 presents the estimation results. To evaluate the exogeneity assumption of the instruments relative to current performance, we rely on two standard post-estimation tests. First, the Arellano-Bond test shows that the null hypothesis of no second-order serial correlation in the error term cannot be rejected. Second, the Hansen and the difference-in-Hansen tests of overidentifying restrictions indicate that neither the null hypothesis of the joint validity of the full instrument set in the first-differenced equation nor the null hypothesis of the validity of the additional exclusions restrictions in the levels equation can be rejected. Thus, the instruments of the estimated models are valid and the number of instruments is not excessive.

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[25] For the sake of brevity, these estimation results are not shown herein.

Table 14: Regressing Company Performance on Ownership and Governance Variables

We estimate the following empirical model: $y_{it} = \alpha + \gamma\, y_{i,t-1} + x'_{it}\beta + \eta_i + \varepsilon_{it}$, where y_{it} is the return on asset of the company i in year t, $\mathbf{x}_{it}$ is a vector of the explanatory (ownership and governance) and control variables, η_i refers to the company-fixed effects, and ε_{it} is the idiosyncratic error. Control variables include: *ln_asset*, the natural log of company total assets; *ln_age*, the natural log of the company age; *lev*, the company leverage; *ln_q_tobin*, the natural log of company Tobin's q; *tang*, the ratio of tangible assets over total assets; *capex*, CAPEX scaled by PPE, and year dummies. The ownership and governance variables of the estimated model specifications presented below comprise *cfr*, the largest ultimate shareholder's (LUS) fraction of the company cash-flow rights; *vr*, the LUS fraction of company voting rights; *pn*, the fraction of non-voting shares in company outstanding shares; *n_int*, the number of intermediate companies between the sample company and its LUS; *ceo_ch*, a dummy worth 1 if the company CEO and chair are the same person, and 0 otherwise; *fam*, a dummy that takes the value 1 if the LUS is a family, and 0 otherwise; *NM*, a dummy that takes the value 1 if the company is listed on the Novo Mercado, and 0 otherwise; and the interaction terms *fam* X *ceo_ch* and *int* X *NM*. N, NoC, and NoI mean number of observations, companies/clusters, and instruments, respectively. AR(1)p and AR(2)p stand for the p-values of the Arellano-Bond tests under the null hypothesis of no first-order and second-order serial correlation in the error term, respectively. Hansen_p and D_Hansen_p refer to the p values of the tests of the exclusion restrictions (exogeneity) of the instruments: the Hansen J test for the first-differences equation, under the null hypothesis of the validity of all the instruments, and the difference-in-Hansen test, under the null hypothesis of the validity of the instruments for the level equations. To limit instrument proliferation, we collapse instruments. Instruments for first differences equation: the second, third, and forth lags of *roa*, *ln_asset*, *lev*, *ln_q_tobin*, *tang*, *capex*, *cfr*, *vr*, *pn*, *n_int*, *ceo_ch*, *fam*, *NM*, *fam_ceo_ch*, and *int_NM* for specification (12); the same instruments of specification (12) excluding the latter two for specification (8); the first six instruments of specification (12) for specification (4). Substituting the first-lag differences for the lags of the variables, the instruments for the equation in levels are the same as for the first differences equation. The sample comprises all the publicly traded companies that filed annual forms with the CVM over the period 2003-2013. Robust, company-clustered standard errors in parentheses. Statistical significance at the 10%, 5% and 1% levels is denoted by *, **, and ***, respectively.

variables	pooled	FE	pooled_dyn	syst-gmm	pooled	FE	pooled_dyn	syst-gmm	pooled	FE	pooled_dyn	syst-gmm
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
L.roa			0.145*	0.0871**			0.143*	0.0860**			0.143*	0.0790*
			(0.0802)	(0.0435)			(0.0812)	(0.0394)			(0.0812)	(0.0418)
ln_asset	0.0145***	0.0195**	0.0122***	0.00135	0.0140***	0.0172**	0.0118***	0.0127	0.0140***	0.0169**	0.0118***	0.0119
	(0.00315)	(0.00800)	(0.00302)	(0.0114)	(0.00359)	(0.00727)	(0.00349)	(0.0100)	(0.00361)	(0.00718)	(0.00351)	(0.0109)
ln_age	0.0186***	0.0190*	0.0146***	0.0101*	0.0185***	0.0217*	0.0159***	0.0172**	0.0185***	0.0225**	0.0160***	0.0164**
	(0.00386)	(0.0114)	(0.00373)	(0.00542)	(0.00405)	(0.0111)	(0.00399)	(0.00683)	(0.00407)	(0.0111)	(0.00402)	(0.00701)
lev	-0.0706***	-0.155***	-0.0586***	-0.0520***	-0.0684***	-0.141***	-0.0581***	-0.0476***	-0.0684***	-0.141***	-0.0581***	-0.0495***
	(0.0128)	(0.0345)	(0.0127)	(0.00389)	(0.0115)	(0.0328)	(0.0127)	(0.00341)	(0.0115)	(0.0329)	(0.0127)	(0.00364)
ln_q_tobin	0.0389***	0.00105	0.0321***	0.0506***	0.0388***	0.000236	0.0310***	0.0363***	0.0389***	0.000441	0.0309***	0.0377***
	(0.0101)	(0.0134)	(0.0101)	(0.0117)	(0.00998)	(0.0143)	(0.0102)	(0.0110)	(0.0100)	(0.0144)	(0.0102)	(0.0120)
tang	-0.0487***	-0.0832**	-0.0478***	-0.130*	-0.0501***	-0.0688**	-0.0525***	-0.0999*	-0.0501***	-0.0680**	-0.0524***	-0.0819*
	(0.0171)	(0.0325)	(0.0176)	(0.0669)	(0.0170)	(0.0313)	(0.0184)	(0.0514)	(0.0170)	(0.0313)	(0.0184)	(0.0496)
capex	-0.00171	-0.00232	-0.00126	-0.0318*	-0.00253	-0.00262	-0.00136	-0.0114	-0.00254	-0.00276	-0.00128	-0.00680
	(0.00204)	(0.00386)	(0.00193)	(0.0175)	(0.00217)	(0.00398)	(0.00185)	(0.0122)	(0.00219)	(0.00399)	(0.00186)	(0.00951)
cfr					0.0346*	0.0174	0.0272	0.0106	0.0347*	0.0183	0.0268	0.0101
					(0.0194)	(0.0277)	(0.0191)	(0.0459)	(0.0195)	(0.0279)	(0.0192)	(0.0499)
vr					-0.00557	-0.0397	0.00304	-0.00328	-0.00567	-0.0418	0.00299	-0.0161
					(0.0178)	(0.0334)	(0.0161)	(0.0524)	(0.0178)	(0.0331)	(0.0162)	(0.0523)
pn					0.0333*	0.0480*	0.0226	0.0427	0.0332*	0.0468*	0.0226	0.0596
					(0.0172)	(0.0283)	(0.0180)	(0.0585)	(0.0172)	(0.0280)	(0.0181)	(0.0575)
n_int					0.00154	0.00248	0.000982	-0.000987	0.00151	0.00435**	0.000717	-0.00173
					(0.00142)	(0.00154)	(0.00139)	(0.00418)	(0.00166)	(0.00174)	(0.00165)	(0.00482)
ceo_ch					-0.000462	0.00667	-0.00361	-0.0444**	-0.00221	-0.000707	0.00158	-0.0580
					(0.00736)	(0.00828)	(0.00718)	(0.0188)	(0.0132)	(0.0106)	(0.0138)	(0.0389)
fam					0.000728	-0.00800	0.00135	-0.0219	0.000287	-0.0107	0.00263	-0.0256
					(0.00778)	(0.0100)	(0.00771)	(0.0239)	(0.00829)	(0.0102)	(0.00811)	(0.0300)
NM					0.0201*	0.0160	0.0181*	0.0278	0.0198	0.0306*	0.0159	0.0175
					(0.0115)	(0.0167)	(0.0101)	(0.0307)	(0.0134)	(0.0179)	(0.0118)	(0.0346)
fam_ceo_ch									0.00248	0.0127	-0.00734	0.0241
									(0.0153)	(0.0155)		(0.0509)
int_NM									0.000111	-0.00973***	0.00127	0.00707
									(0.00319)	(0.00360)	(0.00281)	(0.00735)
N	2,586	2,586	2,218	2,218	2,567	2,567	2,202	2,202	2,567	2,567	2,202	2,202
NoC	395	395	376		392	392	373		392	392	373	
NoI				35				63				71
R-squared	0.267	0.152	0.304		0.274	0.129	0.308		0.274	0.131	0.308	
AR(1)p				0.00557				0.00006				0.00008
AR(2)p				0.167				0.171				0.205
Hansen_p				0.187				0.600				0.723
D_Hansen_p				0.463				0.408				0.487

The first set of specifications comprises as regressors only control variables (company's characteristics), the second set adds ownership and governance variables, and the third also includes interaction variables. Apart from capex, all the control variables show statistically significant coefficients in almost all specifications: age, Tobin's q (except for the FE estimator) and total assets (except for the specifications with the system GMM estimator) are positively related to ROA, which is negatively related to leverage and tangibility. It is noteworthy that leverage in all specifications and estimators is highly negatively associated with ROA at the 1% significance level, suggesting that debt harms profitability, at odds with Jensen's argument. Thus, outperforming companies tended to be older, less indebted, and with higher growth opportunities and more intangible assets.

Concerning ownership and governance variables, the coefficients of most of them are not significant or significance lacks robustness. Using the system GMM estimator, only the dummy for the dual CEO-chairman roles is significantly related to the company performance, but the significance disappears when interaction variables are added. Moreover, while the coefficient of that dummy is negative in the estimation of the dynamic panel GMM, it is positive with the FE estimator. As shown by Wintoki, Linck, and Netter (2012, p. 587), if the current value of an explanatory variable is dynamically related to past values of the dependent variable (e.g. the CEO is also the chairman because the company's good past outperformance gave the CEO more power), the results of a fixed-effects estimation of current values of performance on current values of the explanatory variable will be biased in the opposite direction of the dynamic relation. In only one other specification (column 10, related to FE estimator) the coefficient of at least one regressor is significant at the 5% level: the number of intermediate companies and its interaction with listing on the Novo Mercado.

Augmenting the number of lags used as instruments in the system GMM estimation (lags 2 to 5 and 2 to 6), the coefficient of the dummy for the dual CEO-chairman roles loses significance. Estimating the equation performance using the forward orthogonal deviations transformation (Arellano and Bover, 1995), which subtracts the average of all available future observations from the current value of a variable and thus allows for greater efficiency, the coefficient of the dummy for family LUS is significant (and with a negative sign) regardless of including or not the interaction variables, while that of the dummy for dual CEO-chairman roles is not. Taking the control variables as predetermined, no ownership/governance variables are statistically significant.

Results remain qualitatively the same by replacing LUS voting rights or LUS cash-flow rights with deviation of rights, the dummy for control, or overrepresentation; or the number of intermediate companies with the number of listed intermediate companies or with dummies for the existence of listed or non-listed intermediate companies; the fraction of non-voting shares with dummies for the issuance of such shares or for issuance above 0.6; the dummy for family LUS for any other type of LUS; the dummy for listing on the Novo Mercado with dummies for listing on other segments; the dummy for the dual CEO-chairman roles with any other board variables; and Tobin's q with the growth rate of net revenues.

Wintoki, Linck, and Netter (2012) argue that, as ownership, governance, and other characteristics may affect performance with a delay, estimating the performance equation with lagged regressors can attenuate the effect of simultaneity between the dependent variable (performance) and the right-hand variables, allowing therefore to use the bias-corrected fixed-effects estimator (least squares dummy variable correction, LSDVC) that otherwise could yield biased estimates (Flannery and Hankins, 2013; Bruno, 2005a; Bruno, 2005b). Thus, we also estimate the performance equation with lagged regressors:

$$y_{it} = \alpha + \gamma \, y_{i,t-1} + \mathbf{x'}_{i,t-1} \boldsymbol{\beta} + \eta_i + \varepsilon_{it} \qquad (3).$$

As Table 15 shows, whatever the estimator employed (OLS, system GMM, or LSDVC), the lagged ownership variables have no influence on firm performance.

In sum, after controlling for unobservable heterogeneity, simultaneity, and dynamical endogeneity potentially affecting the relationship between the current ownership/governance characteristics and previous company performance, we find no significant relationship between the current values of performance and ownership/governance characteristics. Although in disagreement with the expropriation view, this result endorses previous studies evincing that company's ownership and performance are endogenous and both are influenced by the company's characteristics such as, among others, size, financial leverage, tangibility, and Tobin's q (Demsetz, 1983; Demsetz and Lehn, 1985; Himmelberg, Hubbard, and Palia, 1999; Pindado and de la Torre, 2004; Wintoki, Linck, and Netter, 2012). Even bearing in mind potential limitations of the dynamic panel system GMM estimator (such as the risk of weak instruments and misspecification), it appears as the best available method using panel data regression model for dealing with this paper's question.

Table 15
Regressing Company Performance on Lagged Ownership and Governance Variables

We estimate the following empirical model: $y_{it} = \alpha + \gamma\, y_{i,t-1} + \mathbf{x'}_{i,t-1}\boldsymbol{\beta} + \eta_i + \varepsilon_{it}$, where y_{it} is the return on asset of the company i in year t, $\mathbf{x}_{it}$ is a vector of the explanatory (ownership and governance) and control variables, η_i refers to the company-fixed effects, and ε_{it} is the idiosyncratic error. Control variables include *L.ln_asset*, the natural log of lagged company total assets; *L.ln_age*, the natural log of lagged company age; *L.lev*, the lagged company leverage; *L.ln_q_tobin*, the natural log of lagged company Tobin's *q*; *L.tang*, the ratio of lagged tangible assets over lagged total assets; *L.capex*, lagged CAPEX scaled by lagged total assets, and year dummies. The ownership and governance variables of the estimated model specifications presented below comprise: *L.cfr*, the lagged largest ultimate shareholder's (LUS) fraction of the company cash-flow rights; *L.vr*, the lagged LUS fraction of company voting rights; *L.pn*, the lagged fraction of non-voting shares in company outstanding shares; *L.n_int*, the lagged number of intermediate companies between the sample company and its LUS, respectively; *L.ceo_ch*, the lag of a dummy that worth 1 if the company CEO and chair are the same person, and 0 otherwise; *L.fam*, the lag of a dummy that takes the value 1 if the LUS is a family, and 0 otherwise; *L.NM*, the lag of a dummy that takes the value 1 if the company is listed on the Novo Mercado, and 0 otherwise; and the interaction terms *L.fam* X *ceo_ch* and *L.int* X *NM*. N, NoC, and NoI mean number of observations, companies/clusters, and instruments, respectively. AR(1)p and AR(2)p stand for the p-values of the Arellano-Bond tests under the null hypothesis of no first-order and second-order serial correlation in the error term, respectively. Hansen_p and D_Hansen_p refer to the p values of the tests of the exclusion restrictions (exogeneity) of the instruments: the Hansen J test for the first-differences equation, under the null hypothesis of the validity of all the instruments, and the difference-in-Hansen test, under the null hypothesis of the validity of the instruments for the level equations. To limit instrument proliferation, we collapse instruments. Instruments for first differences equation: the second, third, and forth lags of the first lag of the following variables: *roa*, *ln_asset*, *lev*, *ln_q_tobin*, *tang*, *capex*, *cfr*, *vr*, *pn*, *n_int*, *ceo_ch*, *fam*, *NM*, *fam_ceo_ch*, and *int_NM* for specification (5). The instruments for the equation in levels are the same as for the first differences equation once substituting the first-lag differences for the lags of the variables. The sample comprises all the publicly traded companies that filed annual forms with the CVM over the period 2003-2013. Robust, company-clustered standard errors in parentheses. Statistical significance at the 10%, 5% and 1% levels is denoted by *, **, and ***, respectively.

variables	pooled	syst-gmm	lsdvc	pooled	syst-gmm	lsdvc
	(1)	(2)	(3)	(4)	(5)	(6)
L.roa	0.468***	0.0568	0.238***	0.468***	0.0469	0.237***
	(0.0917)	(0.300)	(0.0266)	(0.0917)	(0.273)	(0.0267)
L.ln_asset	0.00802***	0.00201	-0.0132	0.00807***	-0.00245	-0.0137
	(0.00248)	(0.0151)	(0.0103)	(0.00249)	(0.0122)	(0.0103)
L.ln_age	0.00860***	0.0168*	0.00708	0.00880***	0.0153	0.00771
	(0.00284)	(0.00943)	(0.0145)	(0.00286)	(0.00944)	(0.0144)
L.lev	-0.0374***	-0.0493**	0.00993	-0.0374***	-0.0430**	0.0101
	(0.00801)	(0.0220)	(0.0151)	(0.00799)	(0.0211)	(0.0153)
L.ln_q_tobin	0.0102*	-0.00597	0.00623	0.0102*	-0.0125	0.00613
	(0.00546)	(0.0148)	(0.00475)	(0.00547)	(0.0139)	(0.00472)
L.tang	-0.0255*	-0.0225	-0.0663***	-0.0254*	-0.0142	-0.0664***
	(0.0134)	(0.0553)	(0.0199)	(0.0135)	(0.0501)	(0.0199)
L.capex	0.00327	0.0195	0.00223	0.00336	0.0155	0.00223
	(0.00526)	(0.0155)	(0.00185)	(0.00527)	(0.0152)	(0.00184)
L.cfr	0.0162	0.00211	0.00456	0.0157	-0.0254	0.00696
	(0.0112)	(0.0568)	(0.0291)	(0.0113)	(0.0597)	(0.0289)
L.vr	0.0103	-0.0295	0.00857	0.0106	-0.000560	0.00637
	(0.0114)	(0.0561)	(0.0271)	(0.0115)	(0.0571)	(0.0271)
L.pn	0.00848	-0.00303	0.00614	0.00856	-0.0255	0.00592
	(0.0136)	(0.0775)	(0.0331)	(0.0137)	(0.0760)	(0.0333)
L.n_int	0.000731	0.00378	-0.000656	0.000525	-0.00112	0.000565
	(0.000984)	(0.00462)	(0.00254)	(0.00113)	(0.00590)	(0.00303)
L.ceo_ch	-0.000294	0.0189	0.0100	0.00960	0.0166	0.0145
	(0.00509)	(0.0338)	(0.00985)	(0.00988)	(0.0480)	(0.0114)
L.fam	-0.000315	-0.0190	0.00656	0.00238	-0.0153	0.00834
	(0.00588)	(0.0278)	(0.0118)	(0.00662)	(0.0369)	(0.0124)
L.NM	0.0121	0.0289	0.0241	0.0105	-0.00660	0.0334
	(0.00843)	(0.0422)	(0.0206)	(0.00963)	(0.0483)	(0.0221)
L.fam X *ceo_ch*				-0.0141	-0.0398	-0.00665
				(0.0114)	(0.0552)	(0.0140)
L.int X *NM*				0.00112	0.0150	-0.00580
				(0.00185)	(0.0125)	(0.00593)
N	2,113	2,113	2,113	2,113	2,113	2,113
NoC	360			360		
NoI		63			71	
R-squared	0.354			0.354		
AR(1)p		0.122			0.123	
AR(2)p		0.799			0.794	
Hansen_p		0.665			0.466	
D_Hansen_p		0.448			0.438	

5 Conclusion

This paper provides two main contributions: a granular examination of the Brazilian publicly-traded companies' ownership structures and a thorough investigation of their relationship with performance. For achieving both of them, we built a new dataset by hand-collecting and organizing data from mandatory reports that listed companies filed with the capital markets regulator (CVM) in the years from 2003 to 2013. For every listed company in every year over that period, we identify the largest ultimate shareholder (LUS) by reconstituting the ownership chains to trace the corresponding ultimate shareholders and to reckon their shares in the overall capital and in the voting capital. In addition, we raise data on a set of other ownership and governance characteristics – such as the number of intermediate companies separating the LUS from the sample company, the fraction of non-voting shares in the company's shares outstanding, and the size and composition of the boards of directors. So far as we know, this in-depth ownership dataset for Brazilian companies is unique.

Persistence of the high ownership and control concentration as well as of the family control stands out among the main characteristic features of the Brazilian corporate ownership configuration over that period, even in companies listed on the governance premium segments or that went publicly more recently. In 2013, families accounted for 46% of the sample companies' largest ultimate shareholders. It is nevertheless noteworthy that the participation of shareholders' agreements as the LUS increased from 16% in 2003 to 24% in 2013. On average, the LUS owned 67% of the voting rights and 50% of the cash-flow rights, with almost 78% of the companies (83% in 2003) having a controlling shareholder if the cutoff for defining control is 50%. Taking the 40% control cutoff, less than 18% of the companies would be widely held. For companies listed on the Novo Mercado, the average voting rights, though much lower than the other companies', was sufficiently high, 46%, to confer enormous power to the LUS; the average wedge between voting and cash-flow rights was less than 5 percentage points, well below the 17 percentage points for the whole of companies. Discrepancy in rights derived from pyramidal ownership schemes, shareholders' agreements and, for companies not listed on the Novo Mercado, non-voting shares. Even though the weight of preferred shares sharply declined over the period (from an average of 42% of the shares outstanding in 2003 to 23% in 2013), 27% of the companies had issued at least 50% of the shares outstanding as non-voting shares in 2013, reaching 34% of the companies

whose LUS was a family. Companies owned indirectly or through pyramidal arrangements comprised 73% and 18% of the sample respectively, of which one with 12 intermediate companies. The rationale for the widespread existence of indirect ownership in Brazil is still an underexplored topic.

Besides pyramidal schemes, non-voting shares, and shareholders' agreements, controlling shareholders also relied on disproportionate representation in the boards of directors to enhance corporate power. In 2013, 51% of the companies had a CEO sitting on the board, being the chair in 16% of them. On average, the controlling shareholder nominated 74% of the board, 7.5 percentage points above her voting rights. Despite directors' fiduciary duty of protecting the interests of all shareholders, board overrepresentation may bias decision-making regarding corporate strategies and executives' compensation plans towards controlling shareholders'.

Despite the recurring accounts of ownership and control concentration leading to controlling shareholders' malfeasance and wrongdoing at the expense of minority shareholders in Brazil's publicly traded companies (among others, Aldrighi, 2011), our results from the estimation of a dynamic model with the dynamic system GMM panel estimator, after controlling for simultaneity bias, unobservable heterogeneity, and dynamic endogeneity, do not corroborate the view that companies' performance would be systematically swayed by ownership arrangements. In contrast with prior studies that provide evidence for the expropriation hypothesis, albeit without addressing endogeneity issues, our findings vindicate others showing that companies' returns as well as ownership and governance characteristics hinge on companies' attributes that reflect the operating and contracting environment – such as size, age, leverage, and growth opportunities (Linck, Netter, and Yang, 2008; Himmelberg, Hubbard and Palia, 1999; Demsetz, 1983). Thus, ownership structures would result from the complex interplay of companies' contracts, characteristics, and previous performance as well as of stakeholders' interests, power, incentives, and expectations.

The evidence we provide casts suspicion on "one size fits all" policies and regulation targeted at improving corporate governance by restraining organizational choices – e.g. curbing control-enhancing devices, pyramidal business groups, or CEOs' participation in boards. Notably in emerging economies, where institutional and market failures abound, such type of regulation could stymie the operation of organizational structures that may mitigate the effects of these failures.

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# Appendix 1

Ownership Structures of Two Sample Companies

For the sake of illustration, we present below our procedure to calculate voting rights and cash-flow rights of the ultimate shareholders and thus to identify the largest ultimate shareholder (LUS) of two sample companies. We represent the corresponding ownership structures by means of organograms, wherein we reconstitute the ownership chains and identify the main shareholders. We use the following notation:

- Rectangles represent shareholders or the sample companies;
- Arrows indicate ownership relationships; the rectangle where the arrow begins represents the shareholder of the company, which is represented by the rectangle where the arrow ends;
- Percentages adjacent to the arrows refer to the shareholder's percentage in the voting capital (ON) or total capital (CT) in the company at which the arrow points;
- When only one percentage appears in a given arrow, voting rights and cash-flow rights are the same.

Braskem SA' Ownership Structure (2010)

In 2010, the Odebrecht family was linked to Braskem through two shareholders' agreements (ShAs): one with Petroquisa and the other with BNDES Participações (BNDESPar). Nonetheless, that family needed neither of them to control Braskem because it owned more than 50% of its the voting capital – the ShAs merely reinforced the family's voting power. As Figure A1 shows, the Odebrecht family owned 100% of Kieppe Participações and Administração Ltda's voting shares and of the capital. This company in turn owned 55.13% of OBDINV's voting capital and 54.26% of its capital. OBDINV owned the whole voting capital of Odebrecht SA, which by direct and indirect ownership controlled all the votes in Odebrecht Serviços and Participações, which owned 53.79% of BRK Investimentos' voting capital. BRK held 93.16% of Braskem SA's voting capital and 52.48% of its total capital. Due to the ShA with Petroquisa, the family's stake in Braskem's voting capital reached 93.97% but just 20.68% of the cash-flow rights: 54.26%*(9.88%+53.79%*52.48%). This implies a discrepancy between control and ownership of 73.29% percentage points. Ten intermediate companies separated Braskem from the Odebrecht family through the longest ownership chain.

**Figure A1: Braskem's Ownership Structure (2010)**
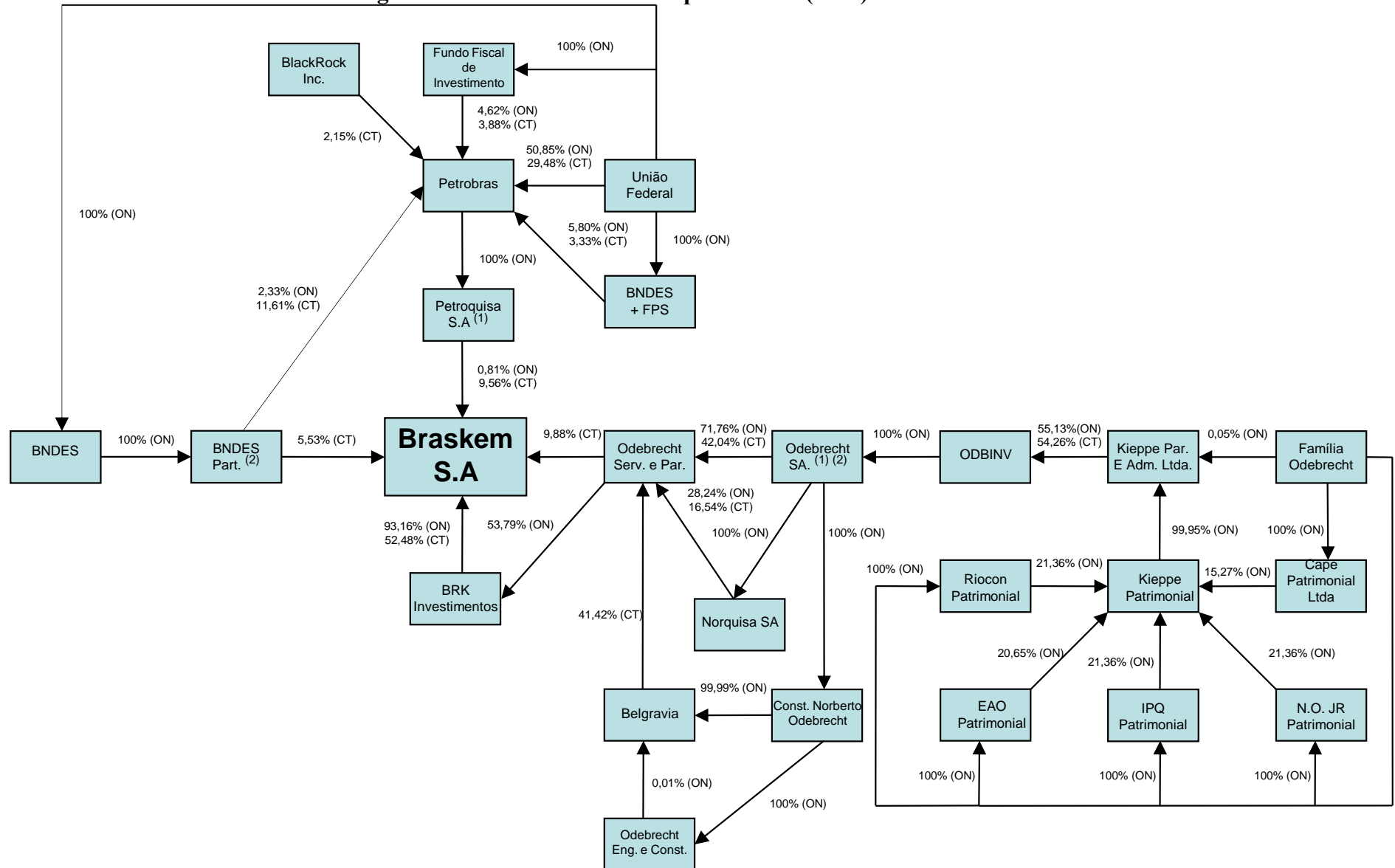
1 – Acordo entre os acionistas Odebrecht S.A. e Petroquisa S.A.
2 – Acordo entre os acionistas Odebrecht S.A e BNDES Participações.

Cosan Indústria e Comércio's Ownership Structure

Cosan Indústria e Comércio (Cosan henceforth) was listed in 2010 on the Novo Mercado, having therefore only voting shares. It was owned through a pyramidal arrangement involving two publicly-traded companies: Usina Costa Pinto and Cosan Limited (Figure A2). Cosan Limited, which held 62.30% of Cosan's capital, and Rezende Barbosa SA, with a 10.88% stake, were joined in a formal shareholders' agreement. The Rezende Barbosa family controlled Rezende Barbosa SA, while Cosan Limited had four direct shareholders: two investment companies (Janus Capital Group and Fundo Gávea, holding 6.33% and 14.57% of its voting capital, respectively) and two companies, Queluz Holdings and Usina Costa Pinto, both of which controlled by the Ometto family through an ownership chain of eight and seven intermediate companies, respectively, which ensured the family a 38.77% stake in Cosan Limited. As Cosan itself disclosed that it was controlled by those two companies, the Ometto family owned indirectly 62.30% of Cosan's shares as it controlled Cosan Limited via Queluz and Usina Costa Pinto. Moreover, due to the shareholders' agreement with the Rezende Barbosa family, the Ometto family held 73.18% of Cosan' voting capital.

Calculation of cash-flow rights was more demanding because there were 49 indirect ownership chains. For the sake of illustration, we take the indirect ownership sequence Ometto Moreno Ltda, Nova Aguassanta, Pedro Ometto Participações, Usina Costa Pinto, and Cosan Limited. Through it Ometto family's participation in Cosan's cash flows rights was 0.2546%, the result of 100%*6.25%*99.99%*58.97%*11.09%*62.30%. Turn now to the indirect ownership chain comprising the intermediate companies Belga Empreendimentos, Usina Bom Jesus, Amaralina Agrícola, Queluz SA, Queluz Holdings II Gmbh, Queluz Holdings Limited and Cosan Limited. Its stake was 0.9657%, the result of 99.98%*53.51%*33.55%*31.20%*100%*100%*27.68%*62.30%. Reiterating the procedure for the remaining 47 ownership chains and adding up the corresponding results, we find that the Ometto family's participation in Cosan's cash-flow rights is 11.50%. As its participation in Cosan's voting rights was 73.18%, the wedge between rights was 61.68 pps. The longest indirect ownership chain separating Cosan from the Ometto family comprised 14 intermediate companies: Belga, Rio das Pedras Participações, Nova Celisa, Usina Bom Jesus, Aguassanta Participações, Nova Aguassanta, Pedro Ometto Participações, Usina Costa Pinto, Santa Bárbara Agrícola, Amaralina Agrícola, Queluz SA, Queluz Holdings II Gmbh, Queluz Holdings Limited and Cosan Limited.

Figure A2: Cosan Indústria e Comércio SA's Ownership Structure (2010)
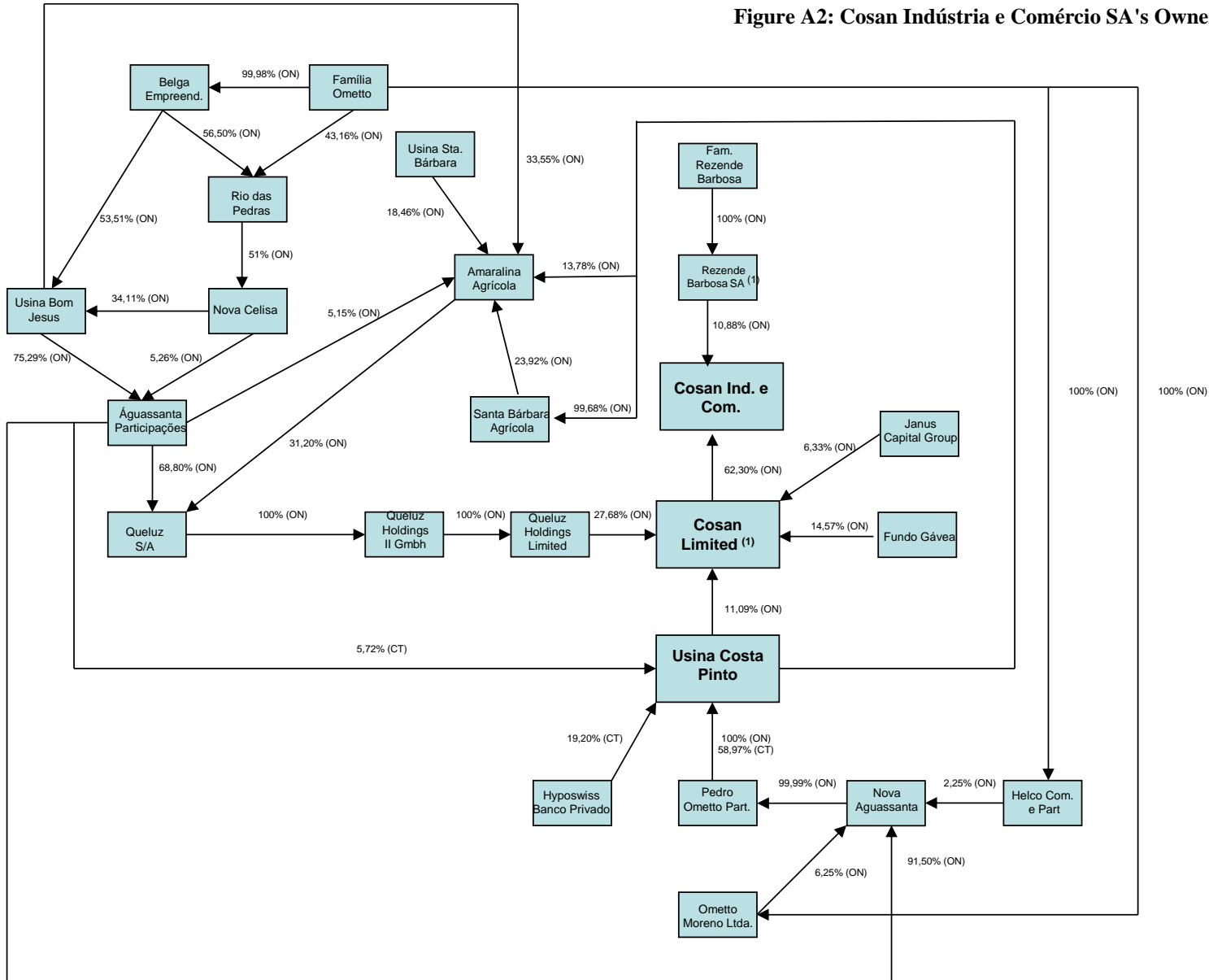
1 – Acordo entre os acionistas Cosan Limited e Rezende Barbosa S.A.

Appendix 2

Table A1
Sectoral Distribution of Companies (%)

| Sector	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2003/13
Agriculture	0.6	0.6	0.6	0.8	1.0	1.3	1.4	1.4	1.5	1.5	1.5	1.1
Chem/petroch.	5.5	5.4	5.3	3.6	3.0	3.4	3.5	2.8	2.3	2.4	1.8	3.5
Construction	4.0	4.0	3.5	4.8	7.7	8.1	7.2	7.0	7.0	7.2	6.8	6.2
Finance	10.1	9.7	10.0	9.2	10.5	9.4	10.7	11.0	10.5	11.0	11.3	10.3
Food/Bev./Tobac.	5.5	5.4	5.3	5.3	6.0	5.5	4.6	4.5	5.0	4.5	4.5	5.1
Mach./Comp./Elec	9.5	9.4	9.4	9.2	8.5	8.4	8.1	8.1	9.3	9.6	9.5	9.0
Manag. of cies	4.3	4.3	4.4	4.5	4.0	4.4	4.9	4.8	3.8	3.9	3.6	4.3
Mining	0.9	0.9	0.9	1.7	1.5	1.6	1.7	2.0	1.2	1.5	1.5	1.4
Miscell. Manuf.	2.6	2.6	2.6	2.5	2.7	2.9	2.6	2.8	2.9	3.3	3.3	2.8
Nonmet. Min.	9.8	9.7	9.7	9.2	7.5	7.6	6.9	6.5	6.4	6.3	6.0	7.8
Oil/Gas/Biofuel	1.7	1.7	2.1	2.2	2.0	1.8	2.0	2.0	2.3	2.4	2.7	2.1
Other Services	4.0	4.3	4.7	6.4	9.0	9.1	9.2	10.1	11.4	11.0	12.5	8.3
Paper and Printing	2.9	2.8	2.9	2.5	2.2	2.3	2.0	2.0	1.7	1.8	2.1	2.3
Telecomm.	8.3	8.2	6.2	5.0	4.5	4.2	3.5	3.4	2.6	2.4	2.4	4.6
Textile/Leather	8.0	7.7	8.5	7.6	7.0	7.6	6.9	7.0	7.0	6.9	6.0	7.3
Trade	5.2	5.4	5.0	5.3	4.2	3.9	4.3	3.9	4.7	4.8	4.8	4.7
Transport/Wareh.	4.3	4.8	5.3	5.0	5.5	4.7	5.2	5.3	5.8	5.1	4.8	5.1
Utilities	12.9	13.4	13.8	14.8	13.2	13.8	15.3	15.4	14.6	14.6	15.2	14.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N. of companies	348	352	341	357	401	383	347	356	343	335	336	3899

Source: Own elaboration with data from CVM. The sample companies were grouped into 21 industries: agriculture; mining; oil and gas; biofuel; textile and leather; food, beverage and tobacco; chemical/rubber/petrochemical; nonmetallic mineral/primary and fabricated metal; paper and printing; machinery, computer, electronic and electrical, and transport equipment; miscellaneous manufacturing; telecommunications; utilities; construction; trade; transportation and warehousing; finance and insurance; management of companies/enterprises; other services.

Table A2
The Largest Ultimate Shareholder's Voting Rights (%)

| Year	mean	p25	p50	p75	sd	max	min	N
2003	73.9	55.6	79.9	95.8	24.7	100.0	10.7	348
2004	73.7	55.7	79.2	96.1	24.5	100.0	5.7	352
2005	73.3	55.7	79.5	95.9	25.0	100.0	5.5	341
2006	71.0	53.1	76.5	95.6	26.4	100.0	5.7	357
2007	69.4	51.9	72.9	94.7	26.9	100.0	6.4	401
2008	69.0	52.1	71.4	94.1	26.7	100.0	8.5	383
2009	70.6	55.0	73.2	96.0	25.8	100.0	5.1	347
2010	68.6	51.8	71.5	94.3	27.0	100.0	5.1	356
2011	67.2	51.4	68.7	91.6	26.1	100.0	5.3	343
2012	66.6	51.0	69.1	92.4	27.0	100.0	5.0	335
2013	66.9	51.9	69.1	92.3	26.7	100.0	5.5	336

Source: Own elaboration with data from CVM. The columns show the following descriptive statistics for every year: the mean, the 25o. percentile, the median, the 75o. percentile, the standard deviation, the maximum, and the minimum. N is the number of observations.

Figure A3
Distribution of Voting Rights for Novo Mercado-Listed Companies (2013)
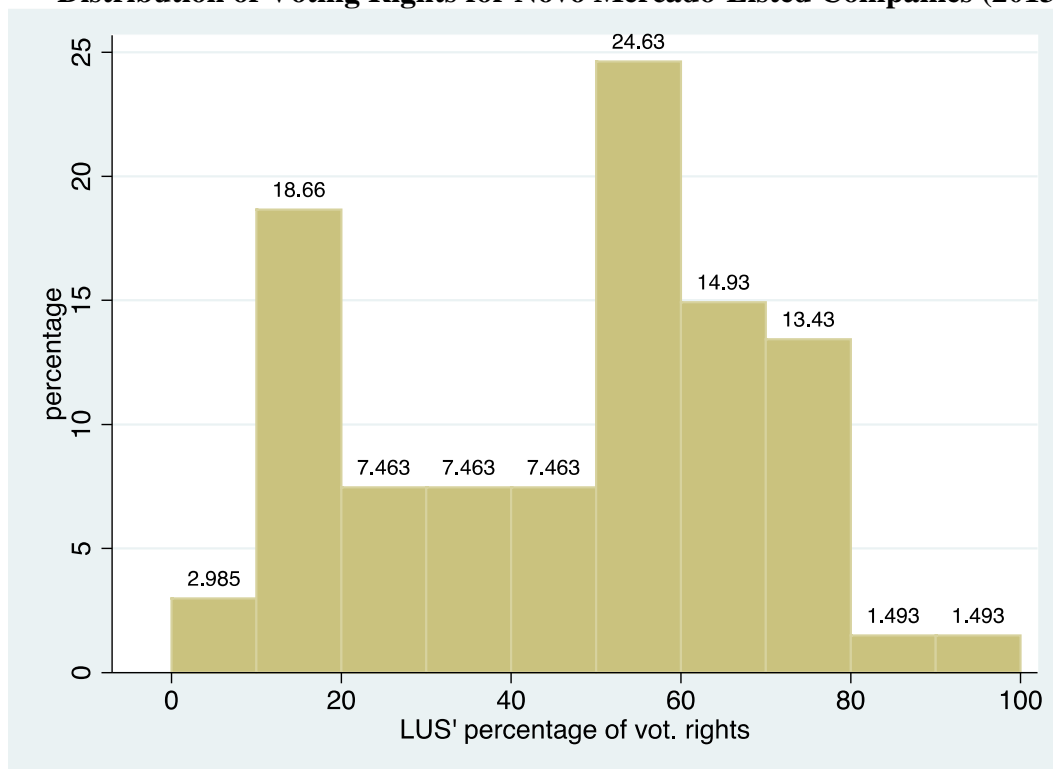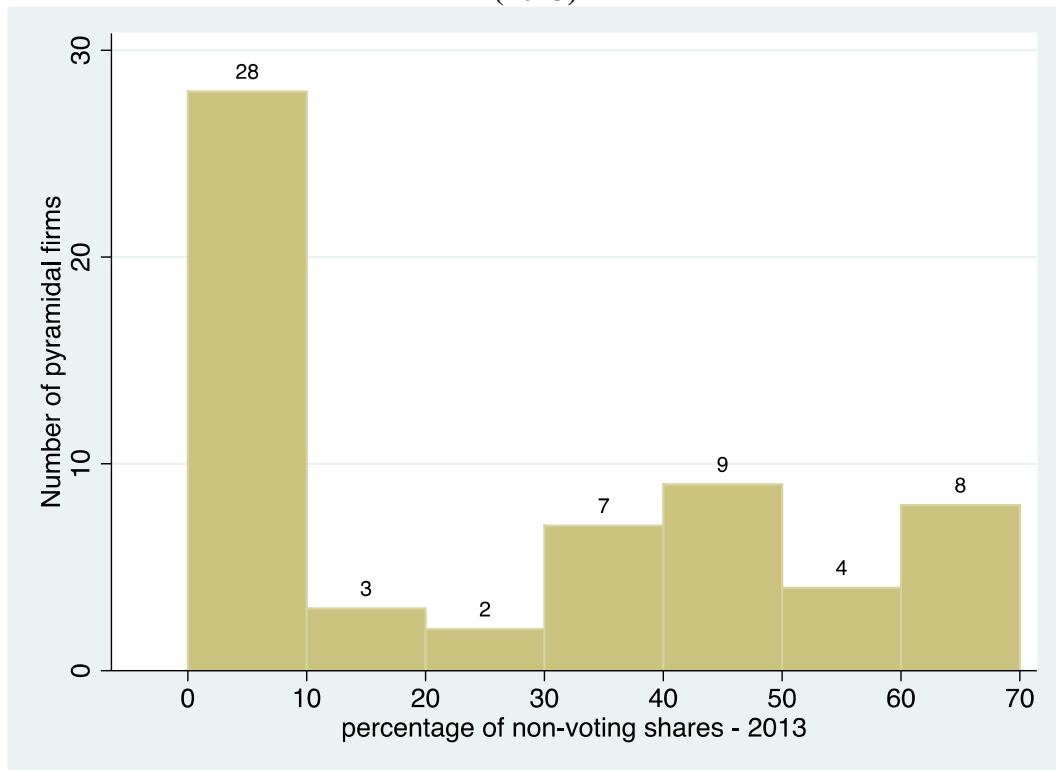

Source: Own elaboration with data from CVM.

Figure A4
The Largest Ultimate Shareholder's Cash-Flow Rights (2013)
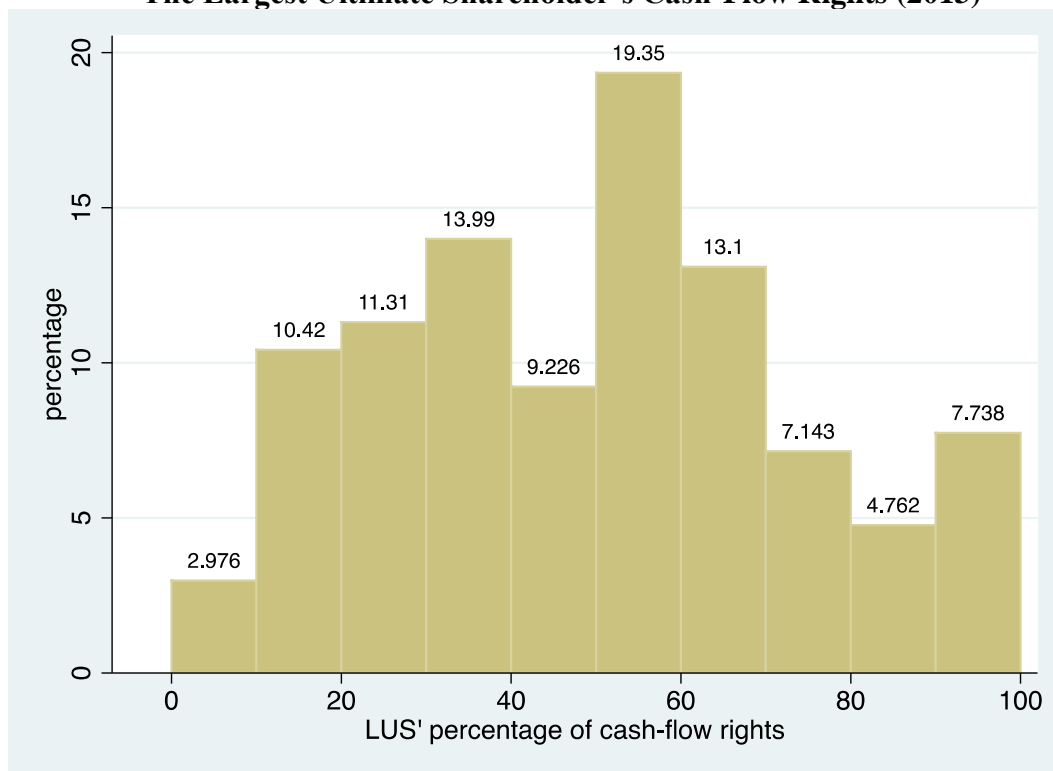
Source: Own elaboration with data from CVM.

Figure A5
Number of Pyramidal Companies According to the Percentage of PN Shares
(2013)

Source: Own elaboration with data from CVM.

Table A3
Definitions of the Variables Used in the Empirical Model

Variables	Description
vr	The fraction of the company's voting rights owned by the largest ultimate shareholder (LUS)
cfr	The fraction of the company's cash-flow rights held by the LUS
dev	The difference between vr and cfr
pn	The fraction of preferred shares in the company's shares outstanding
control	Dummy for the existence of a controlling shareholder in the company
d_pyr	A dummy variable that takes on the value 1 if the LUS owns the company through at least one intermediate publicly-traded company (i.e. through a pyramidal scheme), and 0 otherwise
n_list	The number of intermediate publicly-traded companies separating the LUS and the sample company
d_io	A dummy variable that takes on the value 1 if the LUS owns the company via at least one intermediate company, and 0 otherwise
n_int	The number of intermediate companies separating the LUS and the sample company
fam, gov, foreign, ShA ...	Dummies for the LUS identity's types: if family, government, foreigner, shareholder agreement, pension fund …
bndes	A dummy variable that takes on the value 1 if BNDES is the LUS or a member of the shareholder agreement that is the LUS
ceo_ch	A binary variable indicating whether the CEO of the company is also its board chair (CEO duality)
ceo_dir	A binary variable indicating whether the CEO of the company is also a director
b_size	The number of the company's directors
ext_dir	The fraction of outside directors in the board (those who are neither executive nor the controlling shareholder)
contr_dir	The fraction of directors nominated by the controlling shareholder
b_overrepr	The difference between contr_dir and vr
trad, L1, L2, and NM	Dummies for the companies' listing segments: traditional, Novo Mercado, Level 1, and Level 2
d_pn*	A dummy variable that takes on the value 1 if the company issued at least *% (33%, 50%, or 66%) of the shares outstanding as preferred shares, and 0 otherwise
ipo	A dummy variable that takes on the value 1 if the company went public over the period 2003-2013, and 0 otherwise
d_lus*	A dummy variable that takes on the value 1 if the LUS has at least *% (10%, 20%, 40% or 66%) of the company's voting rights, and 0 otherwise
d_sh_ag	A dummy variable that takes on the value 1 if there is a shareholders' agreement regardless whether it ensures control or not, and 0 otherwise
adr	A dummy variable that takes on the value 1 if the company issued American Depositary Receipt II or III, and 0 otherwise
age	Company age (years since its foundation)
ln_asset	Company size, proxied by the natural log of total assets at 2013 prices
lev	Leverage ratio: the book value of total debt scaled by the book value of total assets as a proxy for the financial structure
tobin_q	Tobin's q: the ratio of the company's market value of equity plus book value of total assets minus book value of equity to the book value of total assets (as a proxy for growth opportunities)
tang	Tangibility ratio, measured as tangible assets (the net value of property, plant and equipment, PPE) scaled by total assets
capex	The ratio of capital expenditures (CAPEX) to PPE
mkt_share	A proxy for market power, measured as the share of a company in the net revenue of all public companies operating in the same industry in a given year
growth	Annual geometric growth rate in net revenue at 2013 prices over the previous 3 years

Table A4
Percentage of Companies with Changes in Governance and Ownership Variables

year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2004-13
cfr ± 5 pps.	26.2	29.7	25.9	27.3	30.6	25.3	26.2	27.2	21.1	19.9	25.9
vr ± 5 pps.	22.7	23.1	25.5	29.2	29.1	18.9	23.8	21.7	21.1	20.7	23.6
control	7.6	13.2	13.6	20.2	10.5	8.8	11.7	8.7	5.7	7.3	10.8
d_io	11.1	8.0	14.1	16.1	7.4	8.4	10.5	11.8	2.8	8.5	9.9
n_int ± 2	12.0	12.3	17.3	20.2	11.6	7.6	10.5	10.3	3.7	7.8	11.3
d_pyr	6.7	7.5	10.9	16.5	5.4	2.8	6.9	6.7	2.4	6.1	7.2
n_list ± 2	4.4	4.2	9.1	15.7	3.1	2.4	6.9	5.9	1.6	5.3	5.9
pn ± 5 pps.	8.9	8.0	14.7	16.6	5.9	3.6	10.5	8.3	2.9	7.0	8.6
ceo_ch	12.9	10.4	15.5	19.9	10.9	8.0	14.1	10.6	6.1	16.3	12.5
ceo_dir	14.7	18.4	18.6	25.1	10.1	12.4	14.5	14.6	8.5	15.9	15.3
ext_dir ± 5 pps.	24.4	25.2	29.2	38.5	20.0	20.9	34.7	25.0	21.3	58.9	30.0
contr_dir ± 5 pps.	22.6	31.1	31.0	33.6	21.6	41.9	36.4	31.8	26.0	24.3	30.0
fam	5.3	8.0	12.7	16.1	8.5	4.8	8.9	9.4	5.3	7.7	8.7
fgn	8.0	7.5	12.3	15.7	4.3	2.8	8.1	7.5	2.4	6.5	7.5
gov	3.1	4.7	9.1	14.2	3.9	2.4	6.9	5.5	2.0	4.9	5.7
Sh_A	8.4	9.4	11.4	18.4	10.1	5.6	6.9	7.5	4.5	8.1	9.1
NM	0.0	1.5	2.5	1.3	1.6	0.0	0.0	3.3	0.4	0.9	1.1
N	225	212	220	267	258	249	248	254	247	246	2426

This table indicates the percentage of the non-financial companies whose value changed by a given magnitude in a determined year or over the whole period. *cfr ± 5 pps* means the percentage of the non-financial companies where the percentage of the LUS cash flow rights changed at least 5 percentage points upward or downward relative to the percentage in the previous year. *n_int ± 2* means the percentage of the non-financial companies where the number of intermediate companies increased or decreased by at least 2 intermediate companies. *cfr* and *vr* stand for the fractions of the company's cash-flow rights and voting rights, respectively, owned by the LUS; *control*: a dummy for the existence of a controlling shareholder; *d_io*: a dummy for indirect ownership; *n_int*: the number of intermediate companies; *d_pyr*: a dummy for pyramidal ownership; *n_list*: the number of listed intermediate companies; *pn*: the fraction of non-voting shares issued by the company; *ceo_ch*: a dummy for whether the CEO and the chairman are the same person; *ceo_dir*: a dummy for whether the CEO is also a director; *ext_dir*: the fraction of external directors; *contr_dir*: the fraction of directors nominated by the controlling shareholder; *fam*, *fgn*, *gov*, and *Sh_A*: dummies for whether the LUS is a family, a foreigner, some governmental entity, or a shareholders' agreement; *NM*: a dummy for being listed on the Novo Mercado; *N*: the number of observations.

Table A5
Test of Strict Exogeneity (Wooldridge, 2010)

To test the strict exogeneity of the explanatory/control variables, we carry out a fixed effects estimation of the equation $y_{it} = \mathbf{x'}_{it}\boldsymbol{\beta} + \mathbf{w'}_{i,t+1}\boldsymbol{\delta} + \eta_i + \varepsilon_{it}$, $t = 2003, 2004 \ldots 2012$, where $\mathbf{w}_{i,t+1}$ is a subset of future values of the ownership and control variables, y_{it} is the return on asset of company i in year t, $\mathbf{x}_{it}$ is a vector of the ownership and control variables, and ε_{it} is the idiosyncratic error (Wooldridge, 2010). Under the null hypothesis of strict exogeneity, the coefficients of the lead variables, $\boldsymbol{\delta}$, should be **0**. *F.* stands for the one-year lead value of the variable. The sample comprises all the non-financial publicly traded companies that filed annual forms with the CVM over the period 2003-2013. Robust, company-clustered standard errors in parentheses. Statistical significance at the 10%, 5% and 1% levels is denoted by *, **, and ***, respectively.

Dependent variable: ROA	(1)	(2)	(3)
ln_asset	0.0184	0.0208	0.0205
	(0.0124)	(0.0142)	(0.0141)
ln_age	0.0288**	0.0357***	0.0356***
	(0.0128)	(0.0128)	(0.0127)
lev	-0.114***	-0.0977**	-0.0979**
	(0.0342)	(0.0415)	(0.0414)
ln_q_tobin	0.0172*	0.0123	0.0113
	(0.00924)	(0.00950)	(0.00938)
tang	-0.0434*	-0.0383	-0.0389
	(0.0242)	(0.0266)	(0.0264)
capex	-0.00347	-0.00254	-0.00259
	(0.00449)	(0.00371)	(0.00376)
cfr		-0.00417	-0.00462
		(0.0203)	(0.0150)
vr	-0.00697	-0.000296	
	(0.0219)	(0.0186)	
pn	0.0563**	0.0503*	0.0437
	(0.0255)	(0.0294)	(0.0318)
n_int	0.00104	0.00268	0.00336**
	(0.00147)	(0.00171)	(0.00166)
ceo_ch	0.00256	0.00235	0.00191
	(0.00909)	(0.00923)	(0.00921)
fam	0.0125	0.0160*	0.0164*
	(0.00928)	(0.00916)	(0.00905)
NM	-0.00238	0.00925	0.0137
	(0.0153)	(0.0177)	(0.0178)
fam_ceo_ch		-0.00381	-0.00330
		(0.0132)	(0.0132)
int_NM		-0.00656*	-0.00951**
		(0.00347)	(0.00379)
F.ln_asset		0.00493	0.00474
		(0.0113)	(0.0112)
F.lev		-0.0358	-0.0351
		(0.0221)	(0.0221)
F.ln_q_tobin		0.00156	0.00183
		(0.00684)	(0.00673)
F.tang		-0.00964	-0.00901
		(0.0252)	(0.0251)
F.capex		0.00212	0.00214
		(0.00258)	(0.00261)
F.cfr		-0.0337*	-0.0342**
		(0.0196)	(0.0169)
F.vr	-0.0370*	0.00124	
	(0.0211)	(0.0202)	
F.pn	0.0218	-0.0140	
	(0.0262)	(0.0267)	
F.n_int	0.000554	0.00131	
	(0.00152)	(0.00170)	
F.ceo_ch	0.00565	-0.0169*	-0.0181*
	(0.00766)	(0.00948)	(0.00956)
F.fam	-0.0168*	-0.0304***	-0.0307***
	(0.00985)	(0.0107)	(0.0100)
F. NM	0.0287*	0.0352*	0.0260
	(0.0169)	(0.0184)	(0.0171)
F.fam_ceo_ch		0.0319***	0.0333***
		(0.0122)	(0.0122)
F.int_NM		-0.00669	
		(0.00418)	
Observations	2,232	2,118	2,121
R-squared	0.100	0.129	0.127