Concentration of ownership and performance: a study in the Brazilian listed companies of the electric utilities industry

Concentração de propriedade e desempenho: um estudo nas empresas brasileiras de capital aberto do setor de energia elétrica

Naiara Leite dos Santos Sant'Ana[1,2]
Natália Carolina Duarte de Medeiros[3]
Sabrina Amélia de Lima e Silva[2]
João Paulo Calembo Batista Menezes[2,4]
Caio Peixoto Chain[5]

Abstract: The concentration of ownership has long been discussed in order to assess its impact on business performance. This article aims to verify whether the ownership structure, more specifically the concentration of property, has an impact on the performance of companies of the electricity sector. Although numerous works on the theme have already been produced, this article introduces a new methodological approach by means of a new combination of variables, rekindling the discussion on the concentration of property in Brazil and the identity of these shareholders - in a peculiar scenery of scandals of mismanagement, controlled results, and business corruption in Brazil - from the perspective of the relationship between private and public capital with analysis performed in the electricity sector. The study was conducted through analysis of panel data. The sample analyzed considered 22 Brazilian public companies of the electricity sector between 2010 and 2014. The results show a better performance of the private enterprises in comparison with the public ones; better performance of companies with ordinary shares in the hands of only one majority shareholder; and a positive relationship with net profit. In contrast, the variables concerning common shares in the hands of the two largest shareholders and total assets showed a negative relationship with performance.

Keywords: Performance evaluation; Corporate governance; Econometrics.

Resumo: *A concentração de propriedade há muito vem sendo estudada para verificar se impacta no desempenho das empresas. O presente artigo tem por objetivo verificar se a estrutura de propriedade, mais especificamente a concentração de propriedade, tem algum impacto no desempenho das empresas do setor elétrico. Embora sejam numerosos os trabalhos que tratam sobre a relação de Desempenho e Concentração de Propriedade, este se propõe a apresentar uma proposta de abordagem metodológica por meio de uma nova combinação de variáveis. O trabalho busca reacender a discussão da concentração de propriedade no Brasil e a identidade desses acionistas em um cenário peculiar de escândalos de má gestão, controle de resultados e corrupção de empresas no Brasil, sob a óptica da relação entre capital privado e público, com a análise sendo feita no setor de energia elétrica. O estudo foi realizado por meio da análise de dados em painel. A amostra compôs-se de 22 empresas brasileiras de capital aberto do setor de energia elétrica analisadas nos anos de 2010 a 2014. Verificou-se melhor desempenho das empresas privadas em comparação com as públicas, das empresas com ações ordinárias nas mãos de apenas um acionista majoritário e relação positiva com o lucro líquido. Por outro lado, as variáveis relativas às ações ordinárias nas mãos de dois maiores acionistas e ativo total apresentaram relação negativa com o desempenho.*

Palavras-chave: *Avaliação de desempenho; Governança corporativa; Econometria.*

[1] Departamento de Ciências Contábeis, Universidade Federal de Juiz de Fora – UFJF, CEP 35010-177, Governador Valadares, MG, Brazil, e-mail: naisantana13@gmail.com

[2] Programa de Pós-graduação em Administração, Universidade Federal de Minas Gerais – UFMG, Av. Pres. Antônio Carlos, 6627, Pampulha, CEP 31270-901, Belo Horizonte, MG, Brazil, e-mail: silva.saamelia@gmail.com; joao.calembo@gmail.com

[3] Departamento de Administração, Centro Universitário de Formiga – UNIFOR, Av. Doutor Arnaldo de Senna, 328, Água Vermelha, CEP 35570-000, Formiga, MG, Brazil, e-mail: nataliamedeiros15@gmail.com

[4] Departamento de Ciências Contábeis, Universidade Federal dos Vales do Jequitinhonha e Mucuri – UFVJM, CEP 39803-371, Teófilo Otoni, MG, Brazil

[5] Programa de Pós-graduação em Administração, Universidade Federal de Lavras – UFLA, Av. Doutor Sylvio Menicucci, 1001, Kennedy, CEP 37200-000, Lavras, MG, Brazil, e-mail: caiopeixotochain@gmail.com

1 Introduction

Studies related to ownership structure have been developed, mostly, with the goal of maximizing the company's value. This work aims at analyzing the concentration of ownership under the scope of the theory of agency and corporate governance, so as to understand its consequences in the company's performance. It is understood that the ownership structure of companies is determined by the concentration of ownership and the identity of its majority shareholder. The concentration refers to the amount of shares held by this majority shareholder. The identity of such majority may be constituted by a family, a bank or other institution, or the government (Campos, 2006; Leal et al., 2002).

The companies present different ownership concentrations. This can cause diverse behaviors displayed by current shareholders, future buyers and the many stakeholders who are interested in the control and ownership of the company, or in its attitudes towards the external environment. Therefore, the structure of ownership is directly linked to concepts that involve the theory of agency and corporate governance – concepts which have a direct impact on the company's performance.

The theory of agency acknowledges, broadly, the possibility of a divergence of interests between shareholders and managers, where each attempts to maximize their own utility. According to the Brazilian Institute of Corporate Governance's (IBGC, 2010) Code of Better Corporate Governance Practices, there is a conflict of interests when one of the parts stands in a biased position in regards to the discussed matter and still can influence or make decisions motivated by interests which are distinct from the organization's.

In such an environment, Corporate Governance shows its importance, for it aims at reducing the informational asymmetry, the conflicts and costs among agents, and the appearance of errors and frauds, thus making the corporate environment safer for the economic agents that interact with it. Considering this, the present article aims at verifying the influence of ownership concentration in the performance of Brazilian listed companies of the Electric Utilities industry in the years from 2010 to 2014, under the scope of the Theory of Agency and Corporate Governance.

Although a great amount of works have been written about the relationship between performance and ownership concentration, the present article intends to present a new methodological approach through a new combination of variables. This work attempts to revive the discussion on ownership concentration in Brazil and the identity of these holders, in a distinct environment of poor management, control of results and corporate corruption, under the scope of the relationship between private and public capital, with an analysis centered on the electric utilities industry. There is not a theoretical consensus on the impact of the concentration of ownership in the performance of the companies, therefore the present study attempted to offer a contribution to the clarification of such ambiguity by simultaneously estimating positive and negative effects of that concentration.

The choice of this industry sector was motivated by its importance for the country's economic development and industrial structure, especially in a situation of water rationing in an energy matrix that relies heavily on this resource.

This article begins with this introduction, followed by the literature review which approaches the following sub-topics: Theory of Agency; corporate governance; ownership structure and concentration; ownership structure and performance; electric utilities industry; and similar works. Then, the methodological procedures are presented, followed by the analysis of the results and the final considerations.

2 Literature review

2.1 Theory of agency

The relationship between ownership and the control of the company can configure itself into a problem in which the administrator – the one who holds control – could use his power in its own favor, while not prioritizing the company and the interest of its owners, who hold its ownership.

This situation, in which the administrator (agent) acts by maximizing its own utility and not maximizing the owner's (principal) utility, leading, therefore, the company into having expenses through incentive, monitoring (from the principal) and "concession of contractual warranties" (from the agent), was defined by Jensen & Meckling (1976) as constituting the costs of agency, which come precisely from the conflicts between agents.

This theory emerged from the works of Alchian & Demsetz (1972) and Jensen & Meckling (1976). Both portrayed the company as a nexus of contracts between individual production factors. In the theory of agency, the contracts rule the relationship between principal and agent, in which some decision powers are delegated to the agent through the provision of services to the principal. Considering that the parts seek to maximize their personal satisfaction, in the case that the agent does not act in the best interest of the principal, the principal must surround him or herself of warranties that seek to avoid damage to their interest.

According to Jensen & Meckling (1976, p. 5), the relationship of agency is "[...] a contract in which one or more people – the principal – engage another person – the agent – to fulfill a certain task in their favor, delegating the authority of decision-making to

the agent". According to the authors, both principal and agent tend to work towards the maximization of their utility, and therefore not always will the agent act according to the principal's interest.

Still according to Jensen & Meckling (1976), the divergences between these two parts can be mitigated by two actions taken by the principal and one by the agent. The principal can take two actions which are costly, and can be effected separately or adjoined: a) establishing incentives for the agent to act according to the principal's interests; and/or b) monitoring the agent's actions. A kind of action that can be taken by the agent is the concession of contractual warranties. Nevertheless, even with these actions of incentive and monitoring, divergences may still occur between the decisions taken by the agent and those that maximize the principal's well-being, which are defined as residual loss.

According to Fama & Jensen (1983), it is not possible for monitoring and the offering of incentives to exist without costs. For Eisenhardt (1989), the theory of agency brought two specific contributions to the organizational thought: the first is the handling of information. According to the author, information is dealt with as a commodity within the theory of agency, having a cost and offering the possibility of being bought. Organizations must invest in information systems in order to control the agents' opportunism. The second contribution regard the costs involved with the future of the organization. The future, controlled only partially by the organization's members, can involve prosperity, bankruptcy or intermediary results.

Other environment-related effects, such as legislation changes, new competition, and technological innovations, can also affect the future of the organization. These uncertainties are seen by the theory of agency as an exchange between risks and rewards. The implication is that the uncertainties of results, when related to the willingness of taking risks, must influence the contracts between agent and principal. For Jensen (1986), managers are encouraged to lead their companies to a growth beyond optimum size, because the addition of resources under their control leads to a growth in their power and a raise in their compensation. These authors also noticed that the most common conflict of agency, when installed, occurs between controlling shareholders and minority shareholders. In the United States, where a large portion of the big corporations have their ownership pulverized among several shareholders, when agency conflicts happen, most of the times, it is in the form of the expropriation of the shareholders' wealth by the managers.

According to Young et al. (2008) it must also be considered that the Agent-Principal problem is more common in developed economies. According to these authors, the conflict between distinct principal groups, that is, between controllers and minority shareholders, is more recurring in emerging economies, due to the concentration of ownership in the company and the lack of effective mechanisms of external governance.

The theory of agency has been constantly rethought. The main aspects of this theory under review are related to the notion that, under certain circumstances, it can be the owner who exploits the company and compromises the long-term interests, while the agents use the access to information to provide gains to the company and its shareholders (Miller & Sardais, 2011).

2.2 Corporate governance

According to Andrade & Rossetti (2004), a single concept of Corporate Governance has not been used, but rather key-words which link most concepts, such as: shareholder rights, rights of other interested parts, conflicts of agency, system of values, system of government, among others.

The first example of a non-financial company with diffuse capital was the Dutch East India Company (*Vereenigde Oostindische Compagnie*), founded in 1602, in which over a thousand investors put their money and quickly faced corporate governance problems. According to Frentrop (2002, p. 46) and Morck (2005, p. 21), this was the first case of a clear conflict between shareholders and managers.

The business world was shaken by crisis that undermined the financial market between 2001 and 2003, especially by the corporate scandals which arose in Europe and in the USA, involving major companies such as Adelphia, Aol, Enron, Global Corssing, Merck, Parmalat, Royal Ahold, Tyco, Vivendi, Warnaco, Wase Management, WorldCom, among others.

Rossoni & Machado-da-Silva (2010) noticed how the importance of Corporate Governance evolved after the corporate scandals which envolved major companies which were respected up to that point. These scandals led to the disappearance of important business organizations and to the destruction of billions of shareholders' dollars and thousands of jobs, which caused the adoption of corrective measures, among which was the approval of the Sarbanes-Oxley Act by the American Congress.

There was a notable development starting in the 1980's, when a movement of institutional investors appeared, mainly associated to North-American pension funds such as the California Public Employees Retirement System (Calpers) and the Teachers' Insurance and Annuity Association – College Retirement Equities Fund (TIAA-CREF), trying to make sure that the companies' managers would act according to the interest of all shareholders.

Frentrop (2002) argues that the Centre for European Policy Studies (CEPS) attempted to clarify the term, but that even for speakers who have English as their first language that is no easy task. For the author, the term has two components: *corporate*, which refers to the corporation or to big companies, and *governance*, which is defined as the act, fact or way of governing. The second component may be the most conflictual aspect. Due to the correlation between the word *governance* with *government*, public elements get confused with something that belongs completely to the private sector.

Inside academia, different authors offer different definitions of the term. For Shleifer & Vishny (1997, p. 737), corporate governance "[...] refers to way in which the companies' resource suppliers assure that they will obtain financial return from their investments".

According to La Porta et al. (1999), corporate governance is "a set of mechanisms through which external investors can protect themselves from expropriation from the internal". According to the Brazilian Commission of Securities (*Comissão de Valores Mobiliários*, or CVM) (CVM, 2002, p. 1), in their Guidebook of Recommendations on Corporate Governance, the Governance can be defined as "[...] the set of practices that aim at optimizing the performance of a company in protecting all interested parts, such as investors, employers and creditors, facilitating the access to capital".

The good practices of Corporate Governance must be followed by all companies. Among the good Governance practices are concepts of transparency when publicizing the company's information, equity among shared information, thus avoiding a conflict between agents.

According to Silva (2006), from the moment that the Brazilian Institute for Corporate Governance was created in 1995, this theme became more pervasive in Brazil, and was therefore more discussed.

Silva & Saes (2007) claim that, in order to reach an efficient governance structure, inefficient structures must be expelled. The time that will be expended and the difficulties that will be faced will depend on the company's rules – formal or informal ones –, which end up privileging certain structures.

Almeida & Almeida (2009) write that the distinct levels of Corporate Governance were created by the São Paulo Stock Market (BM&FBovespa) in 2008, with the objective of reducing informational asymmetry and making the publicized information and companies' operations more transparent. Correia et al. (2011) argue that shareholders wish their investments to be protected by the companies. In this sense, governance plays an important role, for it strengthens the protection of the shareholders' interests against the risk of despoliation by opportunistic managers.

The creation of BM&FBovespa's classification of Corporate Governance levels determines the framing of the company, with the intent of inspiring trustfulness in investors, according to Barbedo et al. (2009). Currently, BM&FBovespa features six segments in their listing: Bovespa Plus [*Bovespa Mais*], Bovespa Plus level 2, New Market, Level 2, Level 1 and Traditional. Almeida & Almeida claim that after the great business scandals in the last years, the attentions have been turned to companies with trustworthy, faithful and transparent information.

Chhaochharia & Laeven (2009) affirm that the process of adopting good Corporate Governance practices becomes expensive for the company, and this is one of the reasons why many companies prefer not to conform to these practices or conform only to those which are legally mandatory.

2.3 Structure, ownership concentration and performance

The separation between ownership, represented by shareholders, and the control of the companies, represented by the managers, was initially approached by Adam Smith in his 1776 *The Wealth of Nations* (Smith, 2003). This work highlighted the concerns with the company's ownership structure, since it discussed the potential cost for the company in the fact that the manager, not the owner, would have at his or her disposal a money which wasn't theirs.

Berle & Means (1932) brought the topic of ownership structure back into the light in their work *The Modern Corporation and a Private Property*, in which they observed, already at that time, the growth of companies and the resulting difficulty in keeping them in the hands of a single proprietor or family. The authors worked on the notion of a pulverization of ownership, reaching initial concepts of a separation between ownership and control.

La Porta et al. (1999) found in their study of shareholding composition, which was based on twenty seven countries including Brazil, that the concentrated ownership structure model is the most frequently seen in the world (they observed a great concentration in the hands of family groups and of the State), questioning the prevalence of the pulverization of shareholding preached by Berle & Means (1932). The studies reached the conclusion that few countries present companies with diffuse capital – this model exists mainly in big corporations in Anglo-Saxon countries such as the United States and the United Kingdom. Countries such as France, Italy and Germany are characterized by a strong concentration of ownership and control.

It can be said that the companies' ownership structure is determined by the concentration ownership and by the identity of the majority shareholder. The structure

may be defined as the mix of capital chosen by the company to make its investments (Teixeira & Nossa, 2010). In another analysis, Brigham & Houston (1999, p. 354) state that the expected capital structure can be composed by the "[...] proportion of third-party capital, preferential shares and ordinary shares which will maximize the share price of the company".

According to Pedersen & Thomsen (1997), the concentration of ownership can be divided as follows: dispersive, when the majority shareholder holds less than 20% of the control; dominant, when the majority shareholder holds between 20% and 50% of control; and majority, when the majority shareholder holds more than 50% of control.

According to Morck (2005), the ownership of most companies in the USA and in the UK is considerably pulverized. In other parts of the globe, on the other hand, such as Brazil, for example, one is faced with a reality based on the concentration of ownership, in which very few shareholders hold a considerable portion of the company's ownership rights. Certain relationships between ownership and control of the company may lead to problems, given that the manager who holds control might effect maneuvers in his own favor, not necessarily prioritizing the interests of the company and of those who hold ownership (Shleifer & Vishny, 1997; Renders & Gaeremynck, 2012).

For Jensen & Meckling (1976), when a company features a concentrated ownership structure, it can display a better performance, given that it will be able to more efficiently monitor the agent's actions. With concentrated shares under the possession of a shareholder, the company transfers a lot of power to this majority, enabling him or her to better monitor business at a lower cost.

Claessens et al. (2002) found a negative relation between ownership concentration and performance. This negative relation happens due to conflicts between majority and minority shareholders. The excessive power in the hands of the biggest shareholders might also lead them to expropriate the companies' cash flow in order to benefit themselves, and in doing so might make bad decisions regarding projects and investments for the company, motivated by personal interests.

Leech & Leahy (1991), however, highlight the fact that the concentration of ownership increases the presence of shareholders in the decision-making processes, directing the owners interests and diminishing the agency's problem, while the shareholders' identity in specific entities allows for the preferences to be shaped by specific results, better aligning the interests and mitigating the agency costs.

In a meta-analytic review, Sánchez-Ballesta & García-Meca (2007) confirmed that the empirical results regarding the relationship between ownership concentration and performance are conflicting. Their

research was made up of dozens of works published in the most relevant journals in the field of finance.

2.4 The electric utilities sector

According to Damasceno et al. (2013), the Brazilian National Electric Energy Agency (ANEEL) has listed in 2012 the rights and duties of consumers and electric energy distributors, and defined the following concepts: terms and parameters involved in energy bills; billing modalities; the division of consumers in classes and bands based on the tension of the provision; the instructions for the requirement of new connections and the instructions on how to acquire data and the emission of energy bills.

According to the Brazilian Electric and Electronic Industry Association (ABINEE, 2015), the electric utilities industry – comprising of generation, transmission and distribution – has made in 2012 a total of R$ 15.3 billion, 17% more than in 2011. Apart from that, according to the Inter-Union Statistics and Social-Economic Studies Department, in 2011 the Brazilian electric utilities industry presented a total of 123,013 formal jobs, a number 15.6% greater than what was registered in 2004 (DIEESE, 2013). When facing this favorable situation, it is important to emphasize that the electric utilities sector has benefited since 2001 from a great amount of loans and funding, especially from the Brazilian National Development Bank (BNDES). According to Siffert et al. (2009), from 2001 to 2002, in the period that followed the energy rationing in Brazil, the electric utilities companies presented restrictions in their financial indicators, and this led the BNDES to offer emergency loans.

According to Bahnemann (2013), from 2003 to 2012 the BNDES has given a total of R$121.7 billion in funding for projects in the eletric utilities sector. These projects represented total investments of R$ 204.7 billion, which turns BNDES into the preponderant agent in the funding of projects of expansion and energetic infrastructure in Brazil, assuring loans around 60% and 70% of the necessary capital (Ventura, 2013). Still according to the author, in 2011 alone the funding reached R$10.5 billion. In 2012, this amount reached R$37.48 billion, a number which owes greatly to the funding of the Belo Monte power plant, in the state of Pará, which will be the largest hydro-electric power plant in the country.

Ventura (2013) argues that the resources made available to the electric utilities sector are compatible with the necessary investments for the expansion of the national electric system. In this sense, the author claims that the electric utilities industry does not face financial restrictions in the short and mid-term.

When approaching the regulation of the energy market in Brazil, Kronbauer et al. (2010) mention

that it starts with the 1934 Water Code, through the Decree 24,643. In 1993 this legislation was revised, and deep changes were introduced through acts and decrees. The concessions act number 8,987/1995 was enacted, regulating article 175 of the 1988 Federal Constitution and instituting rules for the concession biddings, the fees and the concession contracts. Later, the act 9,074/1995 was sanctioned, stipulating a maximum term of 20 years for the concessions.

Siffert et al. (2009) emphasize that the new regulatory framework of the electric /utilities sector was created through the act 10,848, in March 15th, 2004, and effected by the Decree 5,163, in July 30th, 2004. The new model for the sector was considered an advance, for it sought to attract both public and private capital, as well as improving the institutional environment for the introduction of new projects, with a financial structure based on Project Finance, which is a form of division of risks with stakeholders. According to Assunção et al. (2015), after 1995 several extensions of the concessions were granted, already within the frames of the act 9,074/95, which caused the expiration of these terms beginning in 2015.

Confronted by this scenario, the Provisional Act 579/2012 was decreed in September 2012, creating the possibility of an extension of the concessions for up to 30 years. This measure dealt with generation, transmission and distribution concessions, aiming at reducing the final cost of electric energy (Brasil, 2012). For the companies of the sector to renew their concessions, they had to submit to the fare's remuneration that was calculated by ANEEL. This fact caused a great movement in the market, which led to speculations regarding the reduction of the companies' revenue, even after the government stated its commitment to compensate the companies for the fare's reduction (Assunção et al., 2015).

When facing this situation which occurred during the period of research for this work, it is worth mentioning that it has not caused interferences in the results, given that studies like that by Assunção et al. (2015) show that the fulfillment of the Provisional Act 579/2012 can be considered a relevant information for the energy sector, but only with the capacity of altering the behavior of the return of the shares only on the day it becomes public.

2.5 Similar works

Souza et al. (2015), in their article "Corporate Governance and performance of the stocks of companies from the Brazilian electricity sector listed in Bovespa", investigated the relationship between Corporate Governance and the behavior of the stocks of the companies from the electric utilities sector listed in BM&FBovespa, by means of analyzing the indicators of Beta Coefficient (volatility) and the Electric Energy index (Market Value). The period of analysis was divided into two moments, the first ranging from January 1st, 2009 to June 30th, 2011, motivated by the beginning of the USA's real state crisis (subprime) and the imminence of the European financial crisis. The second moment is defined by the period after the crisis.

The authors concluded that governance is capable of controlling the volatility of the energy companies' shares, given that tit keeps them less volatile, even in periods of international crisis; and, furthermore, the variability of these companies' market value is as much a cause as it is a symptom of said volatility.

Brugni et al. (2012), in their article "IFRIC 12, ICPC 01 and Regulatory Accountability: influences in the formation of Electric Energy Sector Fees" [*IFRIC 12, ICPC 01 e Contabilidade Regulatória: Influências na Formação de Tarifas do Setor de Energia Elétrica*], investigated whether or not the accounting characteristics of IFRIC 12 and ICPC 01 could significantly influence the formation of fees in the Brazilian Electric Energy sector. In justifying their choice of sector for their analysis, the authors mentioned its economic relevance, its importance to the country's development and, especially, the presence of a specific regulatory accountability.

In their results, the authors demonstrated that the pricing model might be altered, based on the norms, what renders its effective application a complex task in the environment regulated by the National Electric Energy Agency (ANEEL). The work suggests that the main characteristic which substantiates the creation of a regulatory accountability by ANEEL is the impossibility of accounting, by international norms, of the so-called regulatory assets and liabilities, demonstrating how the Brazilian electric utilities industry is one of the sectors that will have its financial demonstrations most affected by the conversion of accounting norms into the international standard.

Oliveira et al. (2015), in their work "Do Governance Practices and Sustainability Influence Corporate Value? An Analysis of the Companies of the Brazilian Electric Sector" [*Práticas de Governança e Sustentabilidade Influenciam o Valor Corporativo? Uma Análise em Companhias do Setor Elétrico Brasileiro*], started with a hypothesis that suggested that the creation of a corporate value is positively associated to good governance practices and business sustainability. Thus, their work aimed at analyzing the relationship between performance and social responsibility and governance practices, under the scope of the Theory of Agency and of the Stakeholders Theory. The research was done on Electric Utilities companies listed in the São Paulo Stock Market, a sector of high environmental and social impact, considering the years 2011, 2012 and 2013.

For the data analysis, linear regression models were estimated with panel data by Random Effects and by Generalized Moments Method – Systemic (GMM-Sys). The results of the research suggested that companies with adequate governance and social responsibility practices feature a better market value. Among the explanatory variables which presented a positive relation with corporate value are the size and independence of the administration committee, the use of stock options as an incentive plan, the size of the company, as well as its participation in BM&FBovespa's Sustainability Index. Nevertheless, the share concentration and control, and the total value of the incentives plan presented a negative relation with the generation of value. Lastly, the authors concluded that the adoption of such practices, apart from conforming to ethical, legal and social principles, contributes to the generation of corporate value.

Almeida et al. (2013), in their article "Composition of the Administration Committee of the Electric Energy Sector in Brazil" [*Composição do Conselho de Administração no Setor de Energia Elétrica no Brasil*], attempted to assess whether or not the composition of committees in the electric utilities sector affects the value and performance of companies. For that end, a bibliographical mapping was done, with an application in the study of an empirical case of said sector. The authors used secondary data based on a sample of 38 major companies in the period ranging from 2005 to 2010, which have their shares negotiated at BM&FBovespa. The results of the panel regressions pointed that the size of the administration committee and its independence presented a positive relation, while the percentage of women in the committee did not present a positive relation with the performance variables.

Lima et al. (2013), in their "Social-Environmental Investments and the Financial-Economic Performance of Companies: And Empirical Study of the Electric Energy Sector Companies listed in BM&FBovespa" [*Investimentos Socioambientais e o Desempenho Econômico-Financeiro das Empresas: Estudo Empírico nas Companhias Abertas Listadas na BM&FBovespa no Setor de Energia Elétrica*], investigated the impact of social-environmental investments in the companies' financial performance, represented by the financial-economic indicators (ROA, ROE, ROM, Ros, net profit, EBITDA and net income). To investigate this theme, the authors used a quantitative research of a descriptive character, through a bibliographic and documental procedure. In the data collection, they researched social balances, IBASE models, and financial-economic information extracted from Economática, from 40 publicly held companies listed in BM&FBovespa, energy sector, in exercise in 2011. The statistics technique which was used was multiple linear regression, considering as independent variables the internal, external and environmental social-environmental indicatiors presented on the social balance, and as dependent variables the revenue, net profit, EBITDA and net income. The results showed that internal social-environmental investments positively influence the financial economic indicators of net profit, EBITDA and net revenue. They find not statistically significant relation with other indicators.

Bernardino et al. (2014), in the work "Corporate Governance and Company Value: A study of Brazilian companies of the electric sector" [*GOVERNANÇA CORPORATIVA E VALOR DA FIRMA: um estudo de empresas brasileiras do setor elétrico*], analyzed the effects of the adoption of corporate governance mechanisms by listed companies of the Brazilian electric utilities industry in their market value, in the period between 2008 and 2012. For that end, they created an index of governance quality, through the method of Main Components Analysis, involving twelve variables which are representative of the governance mechanisms acknowledged by the Theory of Agency. The results revealed a negative and significant relation, that might by related to the particularities of the electric utilities sector, to the little development of the Brazilian capitals market, or even to the companies' reduced liquidity level.

Bernardino et al. (2015), in the article "Governance and Efficiency in Companies of the Brazilian Electric Sector", aimed at relating corporate governance to organizational efficiency. As a result, the authors realized that the relation between the governance index and the efficiency score is positive and significant, as well a the governance index and the LAJIRDA variable (an indicator of financial performance), indicating that well governed companies are more efficient.

3 Methodological procedures

3.1 Sample and data source

The sample consisted of publicly held Brazilian companies of the electric utilities sector listed in BM&FBovespa. The data was extracted from annual financial statements corresponding to period between 2010 and 2014.

The data was collected from Economática, BM&FBovespa, External Disclosure System of the Commission of Securities (DIVEXT/CVM). Software R was used for the estimation of parameter and the conduction of tests, and the data was tabbed on electronic spreadsheets.

According to BM&FBovespa (2015), there are listed 65 companies in the electric utilities industry, 29 (44.62%) of which are classified in the levels of corporate governance: (NM) New Market Company [*Cia. Novo Mercado*], (N1) Level 1 of Corporate Governance [*Nível 1 de Governança Corporativa*], (N2) Level 2 of Corporate Governance [*Nível 2 de Governança*

Corporativa], (MA) Bovespa Plus [*Bovespa Mais*], (M2) Bovespa Plus Company Level 2 [*Cia. Bovespa Mais Nível 2*] and (MB) Traditional Organized Over-the-Counter Company [*Cia. Balcão Organizado Tradicional*]. Apart from that, it is relevant to mention that the electric chain of production constitutes of generation, transmission and distribution companies. Transmission and distribution are regulated activities and generation is a competitive activity.

The article aimed at analyzing the population of the electric utilities sector after 2010 through the methodology of panel; however, for it not to become unbalanced, we have chosen, after conferences, to use companies which had all the information needed in the years from 2010 to 2014.

In this interval, the representation of the sample was verified considering some aspects, such as: contemplated levels of governance, activities conducted by the company, and its importance for the sector. To check these aspects, information and rankings of the BM&FBovespa's and the National Electric energy Agency's websites were used.

On Corporate Governance, of the 29 companies in the population with a classification in the governance levels, 13 classified companies were obtained in the sample, constituting 44.83% of the data. It is noticeable that this percentage is considerably similar to the one previously presented on the percentage of the population of companies with a governance level among the listed companies.

In regards to the activities conducted by the sampled companies – that is, production, transmission and distribution –, it was possible to verify that 14 companies are present in only one of the segments, 5 develop activities in two segments and only 3 companies are present in all segments defined by ANEEL. It must also be emphasized that there is a predominance of the production and distribution segments, identified in 62% of the companies, while only 29% act in the transmission segment – a fact that evidences a tendency to overlook the transmission segment. Finally, we used ANEEL's 2014 ranking of continuity of service, which is divided into two groups: large and small distributors. The large distributors are those that feature an electric energy market larger than 1TWh a year, while the small distributors are those that feature a market with an equal or lower value. By assessing the sample, more than 50% of the companies studied are classified as large distributors according to this ranking.

After the previous considerations, we consider that the sample of 22 companies represents well, considering the established criteria.

## 3.2 Definition of the variables

The variables analyzed in this article were distributed in four parts, and aiming at reducing possible problems caused by the lack of relevant variables, the research uses the main variables which are pertinent to the theory of agency and corporate governance. The first part is constituted by the variable "performance"; the second by the variable "dummy", concerning the nature of the companies (public or private); then, the variables related to ownership concentration; and finally, the control variables: Size and Net Profit.

In order to measure performance ("response" variable), an approximation of Tobin's Q was used as proxy. According to Famá & Barros (2000), this variable is held as a proxy for a company's performance. According to Chung & Pruitt (1994) and Shin & Stulz (2000) *apud* Famá & Barros (2000), given the difficulties in obtaining certain financial data, it is suggested to use simplified procedures for the calculation of the "approximate q". Thus, they define the "approximate q" as such Equation 1:

$$q = \frac{VMA + D}{AT} \qquad (1)$$

where: VMA = Market Value of the shares which are negotiated in stockmarkets; D = VCPC – VCAC + VCDLP, where: VCPC = Accounting value of the company's circulating liabilities; VCAC = Accounting value of its circulating assets; VCE = Stocks' accounting value; VCDLP = Accounting value of the long-term debts; AT = company's total assets.

Initially, we have proceeded with an analysis of the variable Tobin's Q response, through dispersion Graph 1.
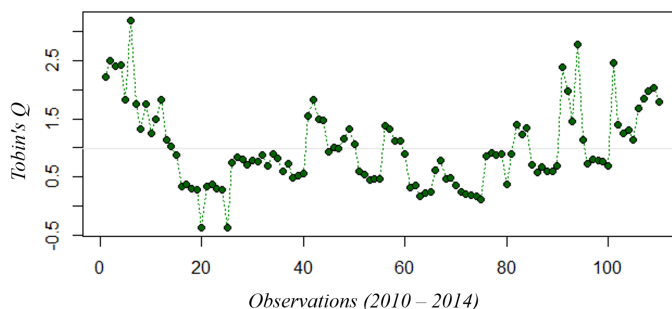
Graph 1. Dispersion of the Dependent Tobin's Q Variable from 2010 to 2014. Source: Developed by the authors (2015).

Graph 1 presents the calculated value for Q's Tobin, used as a proxy for the companies' performance. The horizontal line on the graph represents the variable's average for the period under analysis. It can be noted that the greatest part of information is concentrated between 0.25 and 1.75. Two negative observations were registered, and the observed peak is 3.19.

In order to verify the normality of the response variable, we present the QQ-Plot and the Shapiro Wilk test to prove the graphic evidence, in Graph 2.

Based on the proximity of the data to the transverse normality line, there is evidence that the variable Tobin's Q is normally distributed. To prove it, we have conducted the Shapiro Wilk Normality Test, in which the null hypothesis affirms that the sample comes from a normal population. The ascertained W statistic was 0.986, while at 5% significance the critical W is 0.974. Therefore, the null hypothesis that the sample comes from a Normal population is not rejected.

A dummy variable was used concerning the nature of the companies (public or private), as suggested in a pioneer study conducted by Silvestre et al. (2010) which cite instability and political discontinuity as a hindering factor for public companies of the electric utilities industry. Therefore, private companies are expected to present a superior performance in relation to public ones.

In order to verify the impact of ownership concentration on the performance of the listed Brazilian companies of the energy sector, we used variables related to the percentage of ordinary shares in the hands of the greater shareholder and of the two greatest shareholders. The choice of considering only ordinary stocks is due to the fact that the Brazilian companies raise funds on the stock market, in general, through the emission of shares that do not grant voting rights to its owners, and even though the concentration of ownership positively influences the market value since there is a more efficient managing monitoring of the controlling shareholder, according to a study conducted by Caixe & Krauter (2013). In this sense, it is expected for the performance of the companies with ordinary actions in the hands of the greatest shareholder to be better than those which have more than one shareholder with ordinary shares.

As a way of mitigating the problems caused by variables which are not a part of the model, control variables concerning the financial-economic situation were included, specifically the size of the companies and their net profit. The larger the company, the larger the agency problems and the monitoring costs, which reduces their market value. According to Caixe & Krauter (2013), in this manner the net profit will also be affected, since it is a determinant variable for the trade-off between selling, buying or keeping shares.

Chart 1 presents the variables used and the sign expected by the researchers and the Figure 1 presents the conceptual structure of this paper.

Chart 1. Variables used in the research.

Group	Variable	Description	Expected Sign
Performance Variable (Dependent)	QTob	Approximated Tobin's Q	+
Dummy Variable (Independent)	PRPU	Dummy variable: Value 1 is attributed to private compaies and 0 to public ones	+
Concentration Variables (Independent)	ORD1	Percentage of ordinary shares in the hands of the greatest shareholder	+
	ORD2	Percentage of ordinary shares in the hands of the 2 greatest shareholders	-
Control Variables (Independent)	LOGAT	Size – calculated by the natural logarithm of the total asset	-
	LL	Companies' Net Profit	+

Source: Developed by the authors.
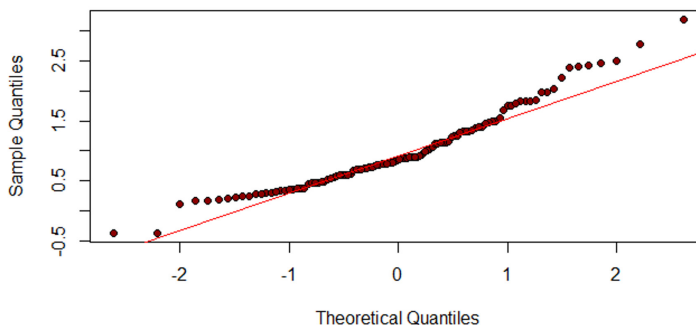
Graph 2. QQ-Plot of the Dependent Variable Tobin's Q from 2010 to 2014. Source: Developed by the authors (2015).
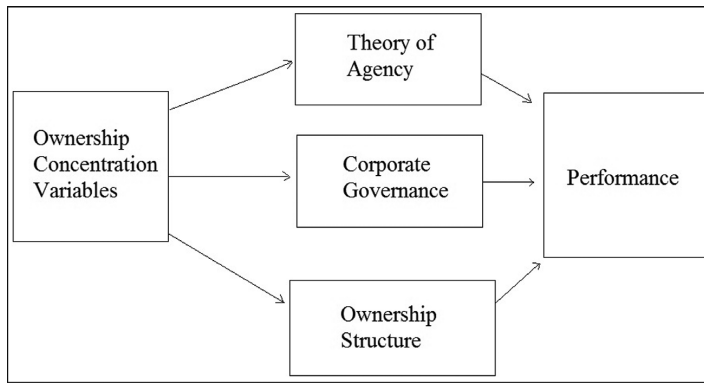
Figure 1. Conceptual Structure. Source: Developed by the Authors.

3.3 Data handling and analysis

The Panel Data have the characteristic of presenting a characteristic that contemplates two dimensions: time and space. Thus, a better investigation of the dynamic of the shifts in the variables can be perceived, making it possible to consider the effect of the non-observed variables. According to Maddala (2003, p. 308), the term "panel data" refers to the set of data obtained on the same individual over the course of several time periods.

According to Gujarati (2006), there are two forms of panel data: balanced and unbalanced. On a balanced panel, the same T periods can be observed for the same units of the N transverse cut. In an unbalanced panel, on the other hand, some units of the transverse cut do not have some periods of analysis.

According to Wooldridge (2006), for the handling of panels, one must highlight the fixed effects and the random effects. The forme is applied directly to unbalanced panels. This model allows the interception to vary in relation to each unit of the transverse cut, taking into consideration the specific characteristics of each one, but assuming that the angular coefficients are the same among them. The estimator of fixed effects considers an arbitrary correlation, characteristics which are not observed of each unit of the transverse cut, and the independent variables on any period of time. The generic Equation 2 is presented as follows:

$$Y_{it} = \beta_{0i} + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + u_{it} \qquad (2)$$

When dealing with random effects, as opposed to fixed effects, it is assumed that the non-observed characteristics are correlated to the explicative variables. The generic Equation 3 can be represented thus:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + w_{it} \qquad (3)$$

The difference between the two models is that in the case of fixed effects, each unit of the transverse cut has its own interception value, in every N value

for N units of the transverse cut. On random effects, the interception β_0 represents the average value of all the interceptions of the transverse cut and the error element represents the random deviation of the individual interception from its average value (Gujarati, 2006). In order to decide which model to use, the Hausman test is applied

4 Results

Table 1 presents the descriptive analysis of the variables which were used in this study. The goal of Descriptive Statistics is to summarize the main characteristics in a set of data. When confronted with a vast list of data, descriptive tables help grouping information in a way that allows them to be analyzed. Through measures or numeric summaries we can obtain important information regarding the set of data, such as: the central tendency, variability, symmetry, extreme values and discrepant values.

The "public private" variable is a dummy, and the average of 0.73 reveals a greater concentration of private companies. Concerning concentration of ownership, it can be verified that, in average, 54.50% of the shares are in the hands of a single shareholder, and 74.08% are held by the two greatest shareholders. As for the variable "net profit", an elevated standard deviation can be noticed, with an average of R$475,171.00.

Table 2 presents the correlations between the regressing variables, where, as expected, greater correlations between ORD1 and ORD2 can be noticed (67.87%). In general, there were presented small corrections. It must be emphasized that tests of correlation of significance to the pairs were conducted.

The data was organized in a balanced panel, and the models of fixed effects and random effects were adjusted. The Hausman test is structured on the following hypothesis and it is used to choose between the models; H0: random effects model is preferable; H1: fixed effects model is preferable. The p-value for the test was 0.0364, indicating the rejection of the null

Table 1. Descriptive statistics of the regressing variables.

Variable	Acronym	Minimum	Median	Average	Maximum	Standard Deviation
Private/Public	PRPU	0.00	1.00	0.73	1.00	0.45
Ord. Greatest shareholder (%)	ORD1	0.00	54.08	54.50	94.89	28.06
Ord. Two greatest shareholders (%)	ORD2	0.00	83.27	74.08	98.70	24.86
Log of the Total Asset	LOGAT	4.14	6.82	6.87	8.31	0.81
Net Profit (R$)	LL	-8049087	323182	475171	4998341	1525840

Source: Elaborated by the authors (2015).

Table 2. Correlation between regressing variables.

	PRPU	ORD1	ORD2	LOGAT	LL
PRPU	1.0000				
ORD1	0.2624	1.0000			
ORD2	0.0703	0.6787	1.0000		
LOGAT	-0.3487	-0.1142	-0.2288	1.0000	
LL	-0.0095	-0.1271	-0.2499	0.0826	1.0000

Source: Developed by the authors (2015).

hypothesis. Therefore, through the Hausman test, it is considered that the fixed effects model is better than the random effects. Thus, the estimated regression model takes the following form of Equation 4:

$$QTOB = \beta_0 + \beta_1 PRPU + \beta_2 ORD1 + \beta_3 ORD2 + \beta_4 LOGAT + \beta_5 LL + \varepsilon \quad (4)$$

After the evaluation, the following results are presented:

It can be noted from Table 3 that all variables in the model were significant at 5% (p-value lower than 0.05). The interception's significance displays the existence of performance even when the explicative variables are zeroed. The relation between the dummy for the classification of the companies in public or private indicated that the fact that a company is private implicates in an increase of 0.4264 units of performance, corroborating Silvestre et al. (2010).

On ownership concentration, the variable ORD1 had the expected positive result, indicating that by increasing the concentration of shares held by a single shareholder, performance is enhanced. The hypothesis considered for such result point to the fact of ownership concentration reducing agency costs, given that there is a mitigation of the conflict of interests between owner and manager, in which the former exercises a direct control over the latter. Variable ORD 2, on the other hand, presents a negative coefficient, showing that the lower the ownership concentration, the worse is the performance, given that there is an increase in monitoring costs.

LOGAT was used as a control variable, displaying a negative sign, corroborating the results of Gugler et al. (2008) and Caixe & Krauter (2013), who state that a company's size impacts negatively in its market

Table 3. Coefficient results and P-value.

| Variables	Coefficient	P-value
Interception (β_0)	3.2196	0.0000
PRPU(β_1)	0.4264	0.0004
ORD1(β_2)	0.0116	0.0033
ORD2(β_3)	-0.0122	0.0169
LOGAT(β_4)	-0.3392	0.0004
LL(β_5)	6.2878	0.0464

Source: Developed by the authors (2015).

value, pointing out that large corporations are subject to greater agency problems and, consequently, higher monitoring costs, which reduce their performance. As for Net Profit, the positive sign was expected, given that an increase in it points out, as a first indicative, a maximization of the company's results.

The determination coefficient which was obtained was of 51.33%, indicating the percentage of the variable response which the regressing explain. As a more robust indicator, the adjusted R2 was used, which takes into consideration the amount of degrees of liberty in the model, and in it the percentage of variation which was explained was of 48.53%. The F Test of general significance of the model presented a p-value approximately null, indicating its insignificance.

For the validation of the proposed regression model, we proceeded with the analysis of the normality of residues via Shapiro-Wilk, Heterocedasticity and Serial Self-correlation. Graph 3 shows the distribution of residues in the model, where the horizontal line represents the series' average, null, as desired.

Graph 4 shows the density curve of a normal distribution alongside the residues' histogram.
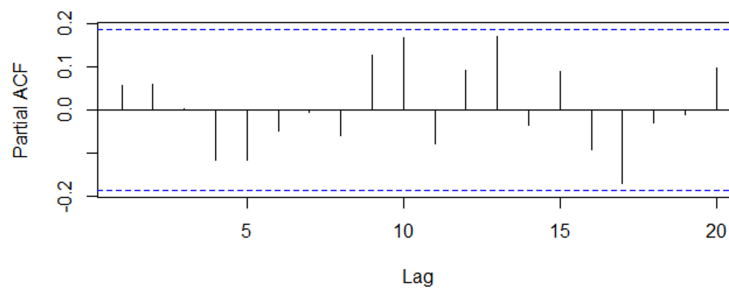
In order to confirm the indications of normality provided by the graphic analysis, we proceeded to
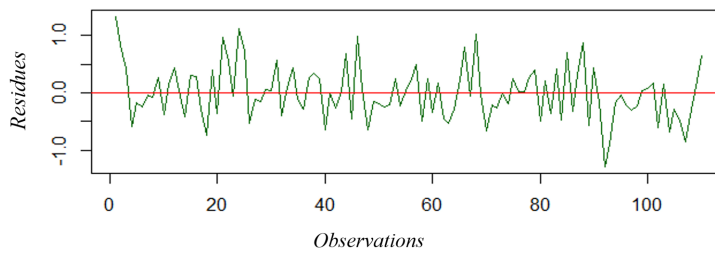
Graph 3. Residues of the adjusted Fixed Effects Model. Source: Developed by the authors (2015).
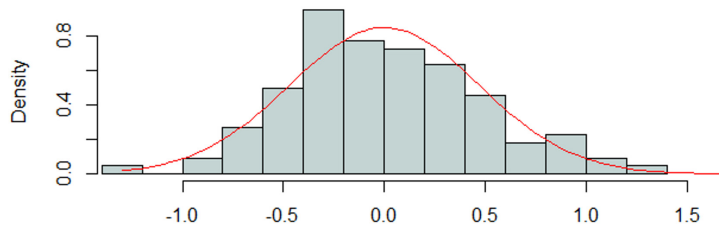
Graph 4. Residues' histogram of the adjusted Fixed Effects Model. Source: Developed by the authors (2015).

Graphic 5. Correlogram of the adjusted Fixed Effects Model's residues. Source: Developed by the authors (2015).

conduct the Shapiro-Wilk test, in which the rejection of the null hypothesis indicates that residues do not follow a normal distribution. The calculated test statistic was of 0.9869, with a p-value of 0.3623, indication the non-rejection of Ho, that is, the residues are normal.

The Breusch-Pagan test is widely used to test the null hypothesis that the variations of the errors are equal (homocedasticity). The calculated test statistic was of 13.9952, with a p-value of 0.1564, indicating that at a significance level of 5%, the variation of the errors is homocedastic.

At last, the self-correction residues test of Breusch Godfrey is elaborated on the hypothesis of the terms of error not presenting self-correction of first order, with an evaluated p-value of 0.5068, what indicates the absence of self-correlation due to the non-rejection of the null hypothesis. Graph 5 presents the correlogram which reaffirms the test's result.

5 Final considerations

This article aimed at verifying the influence of ownership concentration on the performance of listed Brazilian companies of the electric utilities industry, in the years between 2010 and 2014, under the scope of the Theory of Agency and Corporate Governance. In what concerns ownership concentration, it was possible to verify a large concentration of ordinary shares in the hands of the two greatest shareholders. This scenario can, in itself, affect the company's performance, evaluated in this work by using the metric of the approximated Tobin's Q, which allowed us to analyze a positive relation when held by one shareholder and negative when held by two shareholders. Conceptually, ownership concentration is something which should be avoided, according to the Good Practices of Corporate Governance, for several reasons, among which are the informational asymmetry, transparency, results management, frauds and accounting errors. However, when analyzed under the scope of the Theory of Agency, Ownership Concentration tends to enhance the company's Performance, due to the reduction of agency costs in what concerns the reduction of the Monitoring Costs of the Principal towards the Agent.

When confronting Corporate Governance with the Theory of Agency in this work, with face a possible ideal margin of Ownership Concentration

for the data of this study. This can be inferred by the result of the relation between Ownership Concentration and Performance, for the sample in question, which resides between 54.50% and 74.08%. Another possible explanation for the inversion of the Performance-Ownership Concentration relation might be anchored on the increase of the number of conflicts of interests at the moment when another majority shareholder is added. These conflicts are a result of the diverging interests when it comes to the maximization of each of their own utilities.

The literature presents ambiguous discussions, and so do the results of empirical works on the subject of Ownership Concentration and Performance. Positive and negative relations can be perceived between ownership concentration and performance, and both are coherently justifiable in the literature. It is also worth mentioning the relationship between companies of the sector which feature a structure composed by the State, in the analysis we verified a superior performance in the predominantly private companies, as opposed to the findings regarding the public ones, which presented an inferior performance, probably, according to the literature, due to the instability and political discontinuity. Much has yet to be studied in order to reach some parameters. In these studies, one must pay attention to the legislation and to the cultural differences between the countries, as well as the characteristics and peculiarities of the sector. It is suggested that other works be conducted, aiming at comparing the influence of ownership concentration among different sectors. The importance of more studies concerning the Electric Utilities sector in Brazil is noticeable, given the current water crisis faced by the country.

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