**UNIVERSIDAD EAFIT®**

School of Economics and Finance

Degree in Economics

Corporate governance and firm value:

Empirical evidence from electric utilities

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**Abstract**

This study analyzes the impact that Corporate Governance has in the firm value of electric utilities in 2018. It develops the description of the role that Corporate Governance plays in an enterprise, making an emphasis in the behaviors that are seen towards the firm innovation capacity and the importance of choosing the electric industry as the sample of analysis. Data availability was a major constraint to assess the proposed relationship. Nevertheless, an OLS regression was performed for a 2018 cross-sectional database evaluating firm value, measured by the Tobin's Q ratio, against the governance rating of the CSRHub and several other control variables. Our results show a positive and significant relationship between the quality of corporate governance and the value of the company. In view of the restrictions caused by the data availability for an analysis of this kind, suggestions are made for further research that can be held to strengthen the results shown in this study.

**Keywords:** Corporate Governance, Firm Value, Electric Utilities, Firm Innovation Capacity.

**JEL Classification:** G32, G34, O32

**Introduction**

In this fast-changing world, aspects of everyday life tend to transform in order to adapt to the requirements that new generations and new market dynamics demand to function correctly. The behavior of companies worldwide is not the exception. Corporate practices have been redefined to satisfy the new intangible economy and the new patterns of consumption, production and investment that have changed substantially due to globalization and the liberalization of markets (Haskel & Westlake, 2017).

The study of electric utilities is pertinent to be developed because they have become a dynamic industry in the recent decades due to the entry of new technologies into the power generation and distribution markets, situation that has been accompanied by a strong trend towards digitalization. The electric industry has also been exposed to global changes (i.e., Kyoto protocol and emission constraints) and it is considered one of the economic development engines of the countries. Its importance lies in the fact that almost all economic and social functions depend on the safe and reliable operation of the energy-producing infrastructures. Moreover, the total energy consumption in the world is projected to double by 2050, which will turn electrical power and electricity into the type of energy that will define global growth in the next two decades (Novosel, 2018).

To introduce the concept of corporate governance, it is important to mention that it is derived from the theory of the principal and the agent, is a business model that has been used frequently for a long time. The increasing interest for good corporate governance can be explained from a preventive

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perspective, in light of the multiple corporate scandals like Enron, Volkswagen, Nissan, Odebretch, and others. Furthermore, as Bobillo, Rodríguez-Sanz, & Tejerina-Gaite (2018) state, this interest can also be explained by the opportunity that good corporate government represents for building a greater competitive advantage by involving activities that foster innovation and intangible assets promoted by senior managers.

Having described the above, it is relevant to ask: what does corporate governance stands for? What is its role in business world? And, in what percentage does it currently contributes to the company's performance?

To answer these questions, initially, we present a theoretical context of what corporate governance is and the role it plays in the new competitive and innovative environment of the economy. Then, we describe the data that will be used in the econometric model that evaluates how much the quality of governance in electric utilities determine its firm value. An OLS regression was performed for a 2018 cross-sectional database evaluating firm value, measured by the Tobin's Q ratio, against the governance rating of the CSRHub, a certified sustainability management tool which consolidates information on corporate governance, employees, environment and community on more than 17,000 companies from 134 industries in 141 countries. The model is accompanied by several other control variables.

The year chosen is 2018 since it is a year that may evidence the recovery of economies and because it is the most recent information available. We obtain a statistically significant result for an improvement of 0.061 in the Tobin's Q due to a

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10-point increase in the governance rating. These results are subsequently analyzed and followed by recommendations for further research that can nourish the analysis proposed in this study.

**Theoretical framework**

Corporate governance are the mechanisms that enables reaching independence between the management (CEO) and financing (investors) of the firm (Shleifer & Vishny, 1996). It is a structure that specifies the distribution of rights and responsibilities within the organization and establish the rules and procedures for decision-making (Bubbico, Giorgino, & Monda, 2012). The Organization for Economic Co-operation and Development (OECD, 2004, p. 11), defines corporate governance as: *"… a key element to increase economic efficiency and potentiate growth, as well as for encouraging investors' confidence".*

Based on the aforementioned, corporate government can be summarized as the political structure inside a firm in which shareholders or investors, who provide the firms financially, assure their returns by minimizing moral hazard in order to maximize the firm's' economic benefit and not the directors' personal interests. This role holds in actual business environments, but the way in which activities are developed to achieve enterprises goals is what has undergone into a substantial transformation.

Nowadays, information technology has improved the flow of information around companies, making it more accessible and manageable by a larger number of people, a situation that has reinforced the "command and control" type of

organizational design. As a result, directors can perform a more effective monitoring and advising role to ensure that managers see a bigger and more precise picture of the company, with the objective of improving and constructing new value creation actions that are consistent with the organizational strategy (Haskel & Westlake, 2017; Pinillos, Fernández Fernandez, & Fernández Mateo, 2018).

Corporate governance no longer represents only an authority figure, the board in conjunction with the managers provide leadership and strategic direction. They plan, execute and determine the corporate speech to inspire and motivate all those involved with the company (Haskel & Westlake, 2017).

Management control systems are built around the framework of strategy and structure, and it's the top managers who, as grand strategists, allocate the resources and create a broad scale purpose that allows employees the freedom to deliver. In other words, they mark the pace of the company by deciding the assignment of the resources that will be invested and then used by employees (Dutta, 2008).

Businesses with strong internal cultures of good management and high performance, create and maintain these cultures through innovation that requires investing in organizational change that help make good short-term decisions (Haskel & Westlake, 2017).

Considering the profound change in the nature and conduct of business due to fiercer competition and new information technology, the shift that modern

industrial era is experiencing is kicked by intangible assets that make up the main source of competitive advantage (Dutta, 2008). In this scenario, where electric utilities are the subject of evaluation and they have different market characteristics, to have a greater growth by taking advantage of the current dynamics of the economy, they must potentiate their innovative capacity towards other intangible assets that provide them with new sources of value such as patents, employee commitment, reputation or software.

This tridimensional relationship between corporate governance, firm innovation capacity and intangible assets is explained by (Bobillo et al., 2018) and works as follows: Corporate governance is considered a driver of innovation capacity, since the relationship between shareholders, investors and owners determine investing decisions. As the Board of directors decides the distribution of economic resources in a company, a firm corporate governance, which intends to minimize moral hazard and maximize economic benefits, affects the amount of resources invested in research and development which is afterwards derived in innovation. Afterwards, firm's innovation capacity dictates the company's ability to generate new knowledge in the form of intangible assets. By improving the firm's innovation capacity, the company creates knowledge and materializes it through assets that ultimately will create value (Bobillo et al., 2018).

In line with this last relationship that places corporate governance as the promoter of intangibles, the growing importance of the role of corporate governance can be seen then in another way in Graph 1 by the means of the change in the participation of the type of components that make S&P 500 market
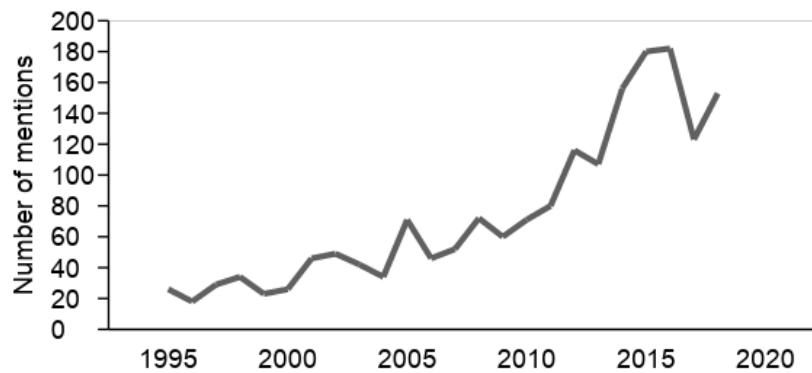
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value, and in Graph 2, which shows the increase in the number of mentions of the word 'intangibles' in the abstract, title or keyword of the academic articles of the ScienceDirect scientific research base.

Graph 1. Components of S&P 500 market value.
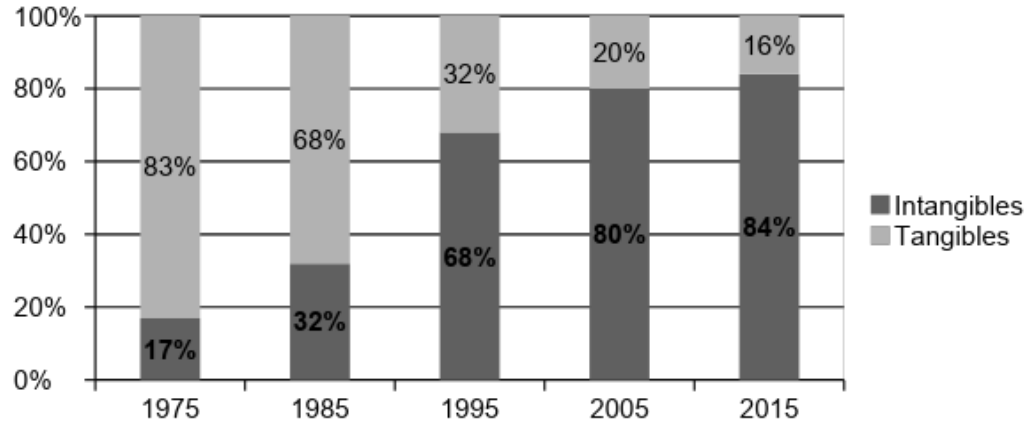


Source: (Ocean Tomo, 2017), own elaboration.

Graph 2. Reference of "intangibles" in scientific journals.



Source: authors' calculations from ScienceDirect.

"*Sustainable competitive advantage comes if a company can do something distinctive or if it owns a distinctive asset*" (Haskel & Westlake, 2017, p. 221)

These assets, called as "strategic resources", can be its reputation, a network of customers, trained employees or product design, but ultimately the most distinctive asset will be the ability to weave all these assets together. Therefore, it can be said that a particularly valuable intangible asset will be the organization itself (Haskel & Westlake, 2017).

Building a good organization is eventually the goal of corporate governance and it is one characteristic of successful businesses. A well-managed organization is defined as continuously monitoring and trying to improve its processes, setting targets and promoting high performance. Two companies of the same industry with the same type of tangible assets can be vastly different, at least partly because of its reputation but also due to the organization itself (Haskel & Westlake, 2017).

Therefore, regardless of the industry or the country in which the companies are located, the behaviors of corporate governance as a whole can vary simply from company to company. Nevertheless, when analyzing individual variables such as the specific profile of the board members, similarities can be evidenced within the industries because of the natural characteristics of the business, or within countries because of the parameters that must be followed in the information disclosure exercise.

Industries that are linked to certain amount of uncertainty, that involve new technology and new markets, well connected directors help smooth some

problems that affect intangible investment because their presence acts as a good signal to investors giving them confidence that the company has a well position to manage and enforce its rights. Companies working in the emerging technology sector, such as electricity generation and distribution, that often depend on intangibles, with a grand and recognized director on their board, can get increases in their share price and a greater facility to raise financing (Haskel & Westlake, 2017).

As mentioned, it has long been proved that good corporate governance has always played an important role in generating value for companies and its potential benefits have been already deeply discussed in literature. In this section, we answered the first two questions raised by this study regarding what corporate governance is and how it behaves in the business world. However, the decision to implement efforts that seek to improve corporate governance within an organization will always be linked to the evaluation of the cost that has to be incurred to develop correctly this activity (Bubbico et al., 2012).

To generate tools to decide if this investment pays off and taking into account all the transformations to which the organizations have been exposed in order to adapt the new technological tools, the new collaborative cultures and the new requirements of the market, the last important question is still unanswered: how much of today's corporate governance quality determines the performance of electric utilities measured by Tobin's Q?

To respond to this, in the next sections it is described the quantitative methodology that was carried out to get the answer of the magnitude of this relationship.

**Methodology**

**Sample**

We study the effect of corporate governance on the value of electric utilities invited to be part of the RobecoSAM Corporate Sustainability Assessment (CSA) for the Dow Jones Sustainability Indices (DJSI)[1].

According to Robinson, Kleffner, & Bertels (2011), being added to the DJSI ends up in a tangible and sustained benefit to the firm's value. This benefit is seen as an answer towards the perspective shareholders give to sustainability and how this contributes to the reputation of the company, due to its deep evaluation of environmental, social and economic aspects.

Hence, the sample is chosen based on this index due to the fact that the companies that are part of it are expected to provide information of good quality and quantity to the market because of the common requirements that must be followed for being listed in the stock market and also because of their willingness to be assessed for this index that also demands certain level of disclosure.

Initially, the dataset was planned to be a data panel, covering the information from 2011 to 2018 on the variables which will be mentioned below. Due to data availability, this data panel was unbalanced and thus, a challenge to build

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[1] See list of invited companies in the following link https://www.robecosam.com/csa/csa-resources/invited-companies.html

an index for the corporate governance variables. After a series of attempts for obtaining reliable information, the data found for the corporate government analysis from CSRHub was only retrievable for 2018 (CSRHub, 2019). For this reason, the final dataset used for the analysis is a 2018 cross-section made up of 90 electric utilities from around the world.

The CSA is conducted annually in conjunction with S&P Dow Jones Indices and RobecoSAM, which is an investment specialist that focuses exclusively on sustainable investment. The companies that are eligible to be assessed are the largest publicly traded companies globally that score a high percentage on sustainability performance within the industry and / or the country (Robecosam, 2019).

A dataset was constructed for the 90 electric utilities with its Tobin's Q ratio, Corporate Governance Rating, Firm Size, Leverage, Profitability, Growth Opportunities Ratio and Turnover Rate, variables which, according to (Black, Jang, & Kim, 2006) may explain Tobin's Q and its relationship with corporate governance. The data on the financial variables analyzed was taken from Bloomberg and the corporate government information comes from the CSRHub web tool.

**Dependent variable**

The use of Tobin's Q is a common practice in corporate governance studies (Black et al., 2006), because it is considered as a "reliable measure of a firm's performance based on its growth potential" (Ciftci, Tatoglu, Wood, Demirbag, & Zaim, 2019, p. 93). Besides, it has the capacity of capturing the effectiveness of

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management relatively better than other valuation multiples (Brahmana, Brahmana, & Ho, 2018; Ciftci et al., 2019).

The valuation of companies can be done through different approaches that can lead to limitations in the results. "The usage of accounting performance measures may be subject of manipulation and variations in accounting and consolidation activities", also "market-based measures of performance may be affected by investor anticipation" (Ciftci et al., 2019, p.93). As a result, Tobin's Q ratio is selected for the analysis because it combines these two approaches equally by computing the market value of total assets divided by their replacement costs (Bloomberg, 2019).

Despite the fact some will argue Tobin's Q might carry shortcomings to the financial performance analyses of electric utilities due to its regulated incomes, the analysis proposed relies on this variable considering the availability of data and the inconsistencies on the exercises carried out with other profitability indicators such as ROA and ROE.[2]

**Independent variables**

**Corporate governance rating**

Over the years, there have been several efforts to summarize corporate governance variables into one index that could assess the quality of the governance in the firms among different countries and industries, and ultimately serve as a tool to determine its relationship with performance (Bubbico et al.,

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[2] The results of the regressions with ROA and ROE as dependent variables can be found in Annexes 1 and 2.

2012). The DJSI, the CDP, and the FTSE4Good are among the most recognized indices, but they do not share methodologies, objectives, or a common questionnaire, which makes it is difficult to have a global vision on which aspects corporate governance have a greater impact on firms (Pinillos et al., 2018).

Due to the variety of reporting frameworks and its lack of standardization, comparisons between companies and industries remains a major challenge. Most of the revised studies, as part of the steps to measure the impact of corporate governance on firm's value, built their own government index according to the specific characteristics of the sample that is analyzed.

The data used for the construction of the most recognized indices was not reachable or available for the firms in our sample. Therefore, we use an alternative measure of corporate governance provided by CSRHub, a web tool that combines sustainability data from diverse sources, and is certified by B Corporation, the Global Reporting Initiative (GRI) and other performance standards. CSRHub constructs a consistent set of ratings enclosed in a final Corporate Social Responsibility (CSR) ranking, that takes into account 4 categories: community, employees, environment and governance.

For this cross-section sample, we use CSRHub's corporate governance quality rating as a measure of governance performance –our independent variable of interest– in this study. It is important to clear out, that the rating goes from zero to 100, being 100 perfect corporate governance practices. Its computation takes into account three subcategories:

The Board subcategory covers principles related to board committee structure and composition, it includes how the company incent executives and board members to

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achieve financial targets. The Leadership Ethics subcategory measures the company relationships with its various stakeholders and its commitment toward integrating social and environmental aspects into the overall core strategy and the day-to-day operations of the company. Finally, the Transparency and Reporting subcategory covers corporate policies and practices aligned with sustainability goals and whether the company is a signatory of leading global entities (CSRHub, 2019).

**Firm specific controls**

Firm size, leverage, growth opportunities, profitability and liquidity are included as control variables that reduce the omitted variable bias.

For *firm size* we use the natural logarithm of total assets. This variable is used in natural logarithm due to the size of the number and the differences between the data. Since Tobin's Q represents the ratio between the market value and the assets value, we expect to observe a negative relationship between firm size and Tobin's Q ratio. Also, larger firms are more likely to have larger boards which lead to greater agency costs and organization inefficiency, so a negatively association with firm performance is expected (Bubbico et al., 2012).

The ratio of debt to common share equity measures *leverage*. It can affect firm performance negatively because higher levels of debt increase bankruptcy risk, but on the other hand it can affect positively because high levels of debt decreases potential agency costs because of less availability of cash (Ciftci et al., 2019).

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*Profitability* is taken from the ratio of operating income to net sales. It is expected a positive correlation with Tobin's Q as more profitable economic results are meant to be rewarded in market price (Brahmana et al., 2018).

Capital expenditure divided by sales measure the *growth opportunities ratio* and capital intensity. Capital expenditure is spent on tangible fixed assets which are expected to have a positive effect on the value of the company. It is an alternative measure of firm efficiency (Black et al., 2006).

Natural logarithm of the turnover rate measures the total amount traded of the security. The value represents all trade prices multiplied by the number of shares relating to each price. It is used as a measure for the stock *liquidity* because firms with more easily traded shares might bring higher share prices (Black et al., 2006).

After considering different scenarios and alternatives, the empirical 2018 cross sectional regression model suggested for the analysis here undertaken is shown as *Equation 1*.

$$(1)\ Tobin's\ Q_i = \beta_0 + \beta_1 GovRating_i + \beta_2 LnTotAssets_i + \beta_3 Leverage_i$$
$$+ \beta_4 OpIncomeSales_i + \beta_5 CapexSales_i + \beta_6 LnTurnover_i + \mu_i$$

For the model previously described, the OLS regression and descriptive statistics were calculated with Stata 14.

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**Data analysis**

Table 1 presents descriptive statistics for related variables, which will allow to understand and analyze results accurately. The quantity of observations taken into the regression are 90 companies (electric utilities) from all around the world. The values for the Tobin's Q oscillate between 0.6 and 2.17, with a mean of 1.16, which can be interpreted as a reflection of underinvestment due to overvalued stocks.

"Stronger corporate governance could increase firms' market price by reducing overinvestment"(Black et al., 2006, p. 378). According to the above, Tobin's Q mean can be a response to the good quality of corporate governance that can be generally evidenced in electric utilities.

*Table 1: Descriptive Statistics*

| Variables | Minimum | Maximum | Mean | Median | Standard Deviation |
|---|---|---|---|---|---|
| Tobin's Q | 0.60 | 2.17 | 1.16 | 1.13 | 0.26 |
| Government Rating | 20 | 61 | 40.53 | 40.50 | 9.29 |
| LN Total Assets | 6.84 | 12.69 | 9.82 | 9.90 | 1.21 |
| Leverage | 1.11 | 31.88 | 3.80 | 3.30 | 3.47 |
| Operating Income to Sales | -4.36 | 84.44 | 22.73 | 18.79 | 16.79 |
| Capex to Sales | 0.06 | 104.59 | 21.71 | 18.79 | 18.25 |
| LN Turnover | 18.69 | 25.16 | 22.20 | 22.34 | 1.87 |

*Tool used: Stata, own elaboration*

After identifying the minimum and maximum values and the mean of our variables, we proceeded to analyze correlation between variables, to see if its signs and magnitudes were true according to the literature revised (Table 2)[3].

*Table 2: Correlation Matrix*

| | Tobin's Q | Government Rating | LN Total Assets | Leverage | Operating Income to Sales | Capex to Sales | LN Turnover |
|---|---|---|---|---|---|---|---|
| **Tobin's Q** | 1.00 | | | | | | |
| **Government Rating** | 0.33 | 1.00 | | | | | |
| **LN Total Assets** | -0.26 | -0.01 | 1.00 | | | | |
| **Leverage** | 0.31 | 0.03 | 0.19 | 1.00 | | | |
| **Operating Income to Sales** | 0.24 | -0.01 | -0.33 | -0.22 | 1.00 | | |
| **Capex to Sales** | 0.07 | 0.01 | 0.16 | -0.08 | 0.27 | 1.00 | |
| **LN Turnover** | 0.16 | 0.17 | 0.71 | 0.29 | -0.20 | 0.23 | 1.00 |

*Tool used: Stata, own elaboration*

As expected, signs of the variables analyzed were all positive respect Tobin's Q, except LnTotalAssets due to the Tobin's Q composition. The ratio divides the market value by the asset value, which leads to the conclusion that the relationship between the total assets must be negative. Also, it is pertinent to notice the fact that the correlation between Tobin's Q and Government Rating is significant and the biggest value in the analysis, reaching a 0.333.

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[3] The third annex shows the heat map of the correlations between variables.

**Results**

Table 3 presents the results of an Ordinary Least Squares regression to assess the relationship between variables with the 2018 cross-sectional dataset. We test for the presence of heteroscedasticity with the Breusch – Pagan test. Since the null hypothesis for homoscedastic data is rejected, we use robust standard errors to correct for heteroscedasticity.

*Table 3: Ordinary Least Squares Regression Tobin's Q*

| Variables | Coefficient (Standard Deviation) |
|---:|:---|
| **Tobin's Q** | Dependent Variable |
| **Government Rating** | 0.0061*** (0.0021) |
| **LN Total Assets** | -0.1248*** (0.0260) |
| **Leverage** | 0.0219*** (0.0052) |
| **Operating Income to Sales** | 0.0031*** (0.0011) |
| **Capex to Sales** | 0.0001 (0.0013) |
| **LN Turnover** | 0.0664*** (0.0159) |

Note: *** Significant at 1%

*Tool used: Stata, Own elaboration*

Taking in consideration the results of the OLS regression made to the sample, when analyzing coefficients by means of elasticity, the proportion of an improvement according to the average in the corporate governance quality is reflected in the Tobin's Q ratio by a 21% increase. Also, the relationship can be seen by means of a 10 points increase in governance rating that implies a 0.061 increase in Tobin's Q ratio, a number that behaves similarly to the literature evaluated. Black et al. (2006), who also used a cross-section database, analyzed the relationship based on a different corporate government index constructed for Korean listed enterprises and obtained the following results: "A moderate 10-point increase in KCGI (Corporate Government Index) predicts a 0.064 increase in Tobin's Q" (Black et al., 2006, p. 379).

Analyzing the results of other papers where panel data was used and an own corporate governance index was built to study the relationship between Tobin's Q and Corporate Governance, coefficients of 0.016 are found by Bubbico et al. (2012); in (Ammann, Oesch, & Schmid, 2011) one standard deviation increase in one of its corporate governance index, is associated with an increase in Tobin's Q of 0.06 and Ararat, Black, & Yurtoglu (2017, p. 129) found that "one standard deviation increase in governance predicts an 8% - 10% increase in Tobin's Q". In view of this, it is possible to highlight the fact that having more data to address more years and more variables in the study may define strongly the relationship studied.

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Due to the high correlation that were found between the Firm size measured by the natural logarithm of total assets and the variables that measure liquidity and profitability, natural logarithm of turnover and operating income to sales respectively, a new regression was made without the firm value variable. To this extent, governance coefficient takes a value of 0.0080.[4]

Firm size has a negative and significant effect in Tobin's Q, holding the expected relationship (-). Smaller firms indicate better market performance and are often are better at facing coordination problems because they are able to reach decisions rapidly (Ciftci et al., 2019). One-unit increase in the natural logarithm of total assets affects negatively the Tobin's Q in 8.37%.

According to our results, there is a positive relationship between firm value and leverage, which implies that higher levels of leverage in the firms analyzed are associated with a stronger firm market performance. According to Ibhagui & Olokoyo (2018), the sense of this relationship hasn't been completely defined by literature, since it can be significantly positive or negative, and following their hypothesis, it is determined by firm size. The positive relationship in the analysis might be due to cash flow effects. Higher debt levels end in less cash available, which may decrease potential agency costs. Debt financing incentivize managers to operate in a more efficient manner (Bubbico et al., 2012).

Our results also show that profitability has a positive impact on Tobin's Q: Given 10 points increase in the ratio of the operating income to net sales, the

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[4] Results of this regression are shown in the fourth annex.

Tobin's Q ratio will experience an increase in 0.03. The intuition behind this result is that the market acknowledges the companies with higher economic benefits. As an example, we can compare two companies included in the sample: Engie Brazil Energia presents a high operating income to net sales ratio of 41,71 and a high Tobin's Q ratio of 1,87, contrasting Electric Power Development that presents a 12,19 operating income to net sales ratio and a Tobin's Q ratio of 0,89, which may be considered low, taking into account the mean of the sample in both variables, which is 22,73 and 1,16 respectively.

For the sample analyzed, the variable of capital expenditure to sales does not explain changes in Tobin's Q. If the coefficient was statistically significant, the analysis of the positive relationship would be that a firm with more and good quality assets would be better valued in the market.

Turnover as a measure of liquidity resulted in a positive and significant relationship with firm value. The higher the turnover rate, the more liquid the company's shares are, which ends up in a higher firm value.

**Conclusions**

According to the results obtained, in the sample of electric utilities assessed by the CSA of the Dow Jones Sustainability Index, and following the CSRHub Government Rating, there is in fact a positive and significant relationship between current corporate governance quality and its firm's value, measured by Tobin's Q. The above leads to the conclusion that good corporate government practices are

outstandingly important, and that its application on electric utilities brings higher firm value as an outcome.

The disclosure of different types of information by companies is currently only made by the request of official entities of each country that regulate and supervise their operations or because companies are linked to private organizations such as RobecoSam. The first source of information does not have good quality and quantity of data, and the data of the second source is not openly available to all publics. If the importance of corporate governance could be empirically demonstrated in this study despite the limitation of data, other managerial theories that could be developed in the future with more information, may contrast more deeply or with a different approach the hypothesis here represented.

**Limitations and recommendations**

All corporate governance studies have important limitations regarding endogeneity, and this one is not the exception. Firms adopt good governance rules in order to give a positive signal to the market, and it is the signal, not necessarily the governance rules, that affect firm value. In the reverse situation, firms with high Tobin's Q choose good governance rules and practices, presumably because this further enhances their market value. There will then be a causal connection between governance and firm value, connection that the OLS coefficient will overstate (Black et al., 2006).

Despite including in this model important control variables supported by literature to overcome endogeneity, the lack of good quality data for the total length

of this study dataset does not make it possible to have an additional extension of control variables that can give complementary conclusions regarding its relationship with Tobin's Q, nor does it help with endogeneity problems or control heterogeneity.

Using a data panel in a firm fixed effect model can also help solve the aforementioned limitations (Black et al., 2006), but this approach cannot be implemented because of the cross-sectional characteristic of the dataset, which is due to the availability of governance data in CSRHub.

On the other hand, to present empirical evidence of the important role of intangibles fostered by innovation, which was initially described, it is necessary to have more information, but the measure of intangible investment is still ambiguous and poor in balance sheets or national accounts and this may be a reason why the shifting from tangible investment to intangible investment has still not been accurately documented to make comparisons between industries and countries (Haskel & Westlake, 2017). Even though some recommendations might be taken from different documents like the Intangible Asset Market Value Study (Ocean Tomo, 2017), the OECD Corporate Reporting of intangible Assets (OECD Corporate Governance Comitee, 2012) or the Oslo Manual (OECD & Eurostat, 2018) it is necessary to highlight the importance to start to measure these intangible variables, define methodologies at a national level and eventually, international standards as to be able to formally measure and estimate the impact of intangible assets in firm's value.

After all the data restrictions that we found during the developing of this study, it is undeniable the great need for good data disclosure at firm and national

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level regarding innovation and intangible assets. The availability of this data could allow the academic community to assess in a better way their importance and repercussions on the economy and eventually find methods to homogenize their quantification worldwide.

In spite of the restriction of information and data quality under which this study was undertaken, the results are encouraging. We expect that this work generates a greater interest in favor of conducting further research regarding the current role of organizational practices applied to different industries or specific-country analysis. By doing so, it might encourage the efforts to reach universal measurement of certain firm variables that are important to study, but very difficult to consolidate for its correct evaluation.

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**Annexes**

*Annex 1: Ordinary Least Squares Regression ROA*

| Variables | Coefficient (Standard Deviation) |
|---|---|
| **ROA** | Dependent Variable |
| **Government Rating** | -0.0135 (0.0265) |
| **LN Total Assets** | -0.5053* (0.2549) |
| **Leverage** | -0.0689 (0.0638) |
| **Operating Income to Sales** | 0.1072*** (0.0149) |
| **Capex to Sales** | -0.323** (0.0130) |

Note: *** Significant to 1%, ** Significant to 5%, * Significant to 10%
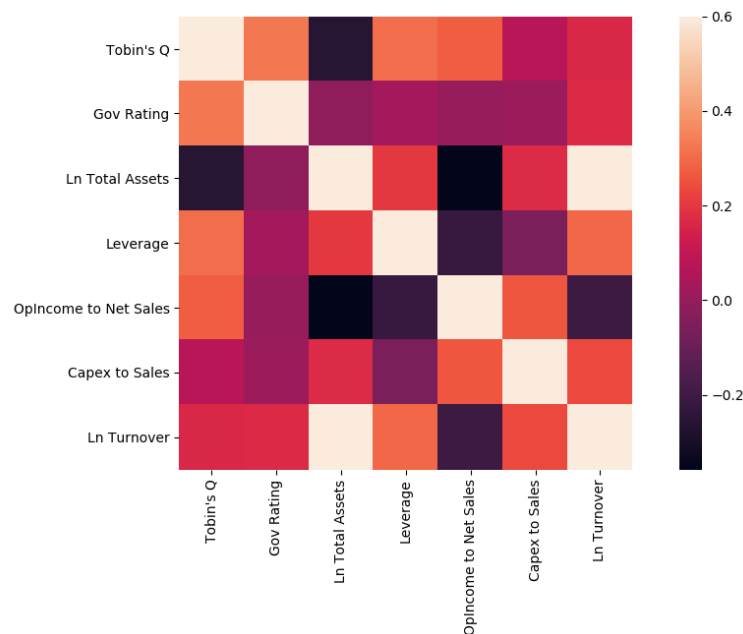*Tool used: Stata, Own elaboration*

*Annex 2: Ordinary Least Squares Regression ROE*

| Variables | Coefficient (Standard Deviation) |
|---|---|
| **ROE** | Dependent Variable |

| | |
|---|---|
| **Government Rating** | 0.0017<br>(0.0909) |
| **LN Total Assets** | -2.8718***<br>(0.8699) |
| **Leverage** | 2.7059***<br>(0.5228) |
| **Operating Income to Sales** | 0.2656***<br>(0.0492) |
| **Capex to Sales** | -0.0290<br>(0.0488) |

Note: *** Significant to 1%, ** Significant to 5%, * Significant to 10%
*Tool used: Stata, Own elaboration*


*Annex 3: Variable Correlation Heat Map*



*Tool used: Python*

*Annex 4: Ordinary Least Squares Regression without LN Total Assets*

| Variables | Coefficient (Standard Deviation) |
|---|---|
| **ROA** | Dependent Variable |
| **Government Rating** | 0.0080*** (0.0024) |
| **Leverage** | 0.0243*** (0.0085) |
| **Operating Income to Sales** | 0.0050*** (0.0013) |
| **Capex to Sales** | -0.0002 (0.0012) |
| **Ln Turnover** | 0.0109 (0.0164) |

Note: *** Significant to 1%, ** Significant to 5%, * Significant to 10%
*Tool used: Stata, Own elaboration*