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Rates Changes and Earnings Management in the Domestic Energy Suppliers

ABSTRACT

Objective: To verify whether the concessionaires of electric energy adopt earnings management (EM) practices, before and after the Periodic Tariff Review (PTR), in order to obtain better rates and attract investors and/or pay bonuses to their managers.

Method: The sample of this study contains all electric power utility companies of B3, covering the period of 2010-2016. We analyzed the impact of PTR using the panel data method.

Originality/Relevance: It was analyzed whether the EM is related to PTR, since the interest of the consumer, the government and the investors is different of the concessionary's interest with respect to the value of the tariff. Notice that investors can make better decisions on how and when to allocate their resources to a specific PTR event.

Theoretical/Methodological Contributions: The findings indicate that in the years of tariff review, there is a greater generation of accruals and diminishments 2 years after the PTR. On the other hand, in EM (operational) the cyclical behavior is similar, but the PTR is negative in the year of the tariff review and positive two periods ahead.

Social contributions to management: These results are understood as long as the concessionaires know that the result of the year of PTR will not influence the Regulatory Agency in the determination of the present revision and reverse them 2 periods ahead, in order to anticipate for the next PTR.

Keywords: Periodic Tariff Readjustment; Earning management; electric power distributors.

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1 INTRODUCTION

Electricity is present in the daily life of most activities involving human relations, such as the production of goods, services and domestic use. With the increasing industrialization and urbanization, the demand for electricity has been increasing (Tomalsquim, 2012). According to Da Silva *et al.* (2015), per capita energy consumption in Brazil will increase about 93.88% by the year 2030. As demand grows, there is a need to increase the supply to balance this equation.

Thus the benefit to the consumer is not always proportional to the value they provide to the electric utility company (Kirschen, Strbac, Cumperayot, & Mendes, 2000). Still, the loss for each consumer is larger and its interests are more diversified than to the contracting parties (distributors) since consumers do not monitor earnings management (Jones, 1991). This is because to sustain the entire energy chain (production, transmission and distribution) the captive consumer pays the distributors through the tariff that must cover all costs, investments and returns to shareholders.

From 1988 onwards, with the promulgation of the Federal Constitution (FC), the profile of the Brazilian electric sector, although still of public character, began to be granted to the private sector. The Union is responsible for exploring, authorizing, granting or permitting the services and installation of electric energy and the energy use of watercourses in articulation with the states where the hydropower potentials are located (Brasil, 1988). Thus, the distributors are, mostly, concessionaires of the electricity distribution service. Therefore, they depend on government-administered and government-defined prices to make up their revenue.

Therefore, in addition to other mechanisms for setting the value of the electricity tariff, the government uses the Periodic Tariff Review (PTR), which takes place every four years on average. At PTR, ANEEL (National Electricity Agency) analyzes the distributors technical data in order to redefine the efficiency level of the concessionaires' operating costs in addition to the return on investments (ROI). After this redefinition, these costs and investments will be updated by official indexes until the next PTR (Brugni, Rodrigues & Szuster, 2012). Therefore, there is an incentive for earnings management between the period of one PTR and the next one in order to set a better rate and, consequently, increase revenue.

Guislain and Kerf (1995) state that in contracts, there must be a parity between the interest of investors, consumers and public authorities, which are directly related to the effective fulfillment of the concession contract, which, among other elements, respect the principle of fair tariff and ensure financial health and economic status of companies in the electricity sector. The effectiveness of the contract may be compromised to the extent that results are managed by unfairly remunerating the prudently invested capital.

Electric power in Brazil has been the subject of several researches. Clemente Silva and Taffarel (2014), are dedicated to studying regulatory events and risk assessment of the electricity sector. Brandão, Gomes and Luz (2012), on the other hand, analyze the dynamics of the electric power market in Brazil. The efficiency of the Brazilian electricity sector in 2010 and 2011 was explored by Boente, Carvalho and Mól (2014). Also, the adoption of international accounting standards was investigated as a possible factor for earnings management practices of companies in the electricity subsector (Borges, Nascimento, & Gonçalves, 2014). Additionally, Andrade and Martins (2017) studied the asset valuation method that can lead to the fair value of equilibrium between the reasonable tariff for the consumer and the appropriate ROI to the concessionaires.

This research aims to verify whether the electric utility companies adopt earnings management practices before and after PTR (1 year and 2 years after the review) in order to obtain better prices and attract investors. One of the plausible motivations for the use of EM practices is the regulation, in order to avoid arousing the attention of regulatory agents. This

behavior is consistent with the political cost hypothesis (Watts & Zimmermann, 1990), since the effects of the regulatory process on accounting procedures give incentives for managers to adopt practices that interfere with the rates set by regulatory agencies.

Consequently, companies in the sector are expected to increase their results in the previous year of PTR in order to attract investments and decrease results in the post PTR periods, in order to obtain a more advantageous tariff and increase revenues. It is noteworthy that although the inputs to define the amounts in PTR via regulatory costs and revenues are based on the average of 4 years, we are interested in how PTR affects the managed amount and when their reversal occurs.

The companies selected in this research are comprised of B3's electric power subsector, specifically Electricity Distributors. The variables derived from the financial statements of the analyzed companies were obtained from *Economática* and the PTR periods and results were taken from the Federal Official Gazette (DOU), as these are officially published. Data refers to the years 2010 to 2016. To verify the variation in earnings management, we used both Jones (1991) and Roychowdhury (2006) accrual management models.

Investors, especially foreign investors, are looking for transparent and stable rules for companies where they will invest their resources (Clemente, Silva, & Taffarel, 2013). Thus, it is important for investors to be secure so that companies can capitalize and fulfill their function, as they are both public and private. Also, this work contributes to ANEEL analysis if its regulation is being efficient about the balance of interest of the government, investor and consumer, since earnings management certainly influences the pricing.

In addition, analyzing the behavior of electric utilities over time and at the specific event of the Periodic Tariff Review may contribute to shareholders and investors allocating their resources in order to increase their profits, as corporate results may directly differ related to periods prior to and not prior to charging.

2 THEORETICAL REFERENCE

The existence of multiple criteria in accounting standards and practices enables managers to choose the various valid alternatives as a means of presenting information in a desired manner, impacting the company's performance or financial structure (Paulo, 2006). Grossman and Stiglitz (1980) states that the usefulness of information is inversely proportional to the level of management adopted by administrators. Thus, the higher the earnings management level practiced by the manager, the less useful the information is for investors, consumers and government.

Earnings management has as one of its negative consequences masking the true financial situation of the company as well the increasing information asymmetry, and can induce the user of that information to make decisions on the basis of statements that do not reflect the reality of the business (Martinez, 2009).

The Constitution of the Federal Republic of Brazil of 1988, accompanied by Laws No. 8,631/93 (equalized the energy tariff and created means of organization of sector agents) and Law No. 9,427/96 (created ANEEL) authorized the transfer to the private initiative services and facilities of electric energy in Brazil.

When it comes to the political costs employed in a business, companies tend to choose a low-cost political network resulting from an affinity between policymakers' preferences and a company's objectives (Sawant, 2012). In addition, the large reported profits may cause political costs to rise (Watts & Zimmerman, 1986).

According to Dechow (1994), present earnings management can come from past management as a way to compensate for them. Therefore, it is necessary to study the companies of the sector for several periods in order to correctly assess its level of management. Assuming that the management of one period reverts to another, if the researcher can predict the period in

which this earnings management occurs and reverses, it can increase the power of the test by 40% (Dechow, Hutton, Kim, & Sloan, 2012).

Companies are more likely to manage earnings to meet a certain benchmark, therefore these companies tend to disclose more complex information, and this conclusion holds true when comparing larger firms with similar characteristics (Lo, Ramos, & Rogo, 2017).

According to DeAngelo (1986), discretionary accruals would be the difference between total accruals and non-discretionary accruals, but for this model, non-discretionary accruals must be continuous, otherwise the measurement of discretionary accruals will be inaccurate. Jones (1991) investigated whether US companies benefited from measures to curb imports (in order to protect the internal market), as consumers have more diffuse interests than companies. The author came to the conclusion that US companies cut their earnings during Import Relief investigations in order to gain greater protectionism from their products. Similarly, electricity distributors have incentives for earnings management prior to the Periodic Tariff Review as it is a regulated service and government-controlled pricing.

In addition, a secure and competitive market depends directly on the usefulness of accounting information. According to Dechow, Ge, Larson and Sloan (2011), the detection of earnings management is relevant to the capital market efficiency and interest of the various stakeholders, such as the investor who can get better returns, the auditor who can avoid future litigation, the analyst who can safeguard his reputation, and the regulator who can best protect investors and prevent the collapse of investments. The interested parties include the government and the captive consumer who depends on the low tariffs to control inflation.

In addition to discretionary accruals, earnings management can also occur through the management of actual activities. Managers' actions that deviate from normal business practices can be considered a manipulation of actual activities (Roychowdhury, 2006). The researcher cites as management practices, for example, discounts for increased sales, increased production to reduce product costs, and reduced discretionary spending.

Literature has already found other incentives for managing actual activities. Roychowdhury (2006) inferred that the presence of debt, inventory and receivables, as well as growth opportunities are positively related to the management of real activities. Therefore, some specific events may be incentives for the manager to manage the company's results, such as PTR.

Greater accounting regulation can increase the cost of earnings management (Taylor & Xu, 2010). As the electricity sector and specifically the distribution sector are heavily regulated not only by the general rules of the Monetary Value Commission (MVC) applied to other companies, but also by the specific rules of ANEEL, it tends to reduce managers' discretion in accounting manipulation. However, this does not completely eliminate the chances of greater earnings management, it only alters managers' strategies in other ways that may be even more costly to shareholders (Zang, 2011).

Thus, considering the regulatory aspects and the conflicts of interest between the government and the electricity distribution companies, we have:

H1: B3's electricity distributors manage their results to worsen them in periods prior to PTR by handling both actual activities and discretionary accruals.

3 METHODOLOGY

The data were obtained from B3 through *Economática* and Federal Official Gazette. Although ANEEL uses its own balance sheet data for its final analysis of the applicable energy tariff, this dataset was only released from 2013 and would restrict the data. Thus, we choose to use the data from *Economática*.

The study period is from 2010 to 2016. Considering that the cycles of PTR are on average 4 years, with the first one occurring between 2003 and 2006, the second between 2007 and 2010, the third between 2011 and 2014 and the fourth between 2015 and 2018, this paper analyzed the second half of the second cycle, the third cycle in its entirety and the first half of the fourth cycle. Also, the distributors undergo revisions in different years, depending on the concession agreement. The reduction in the number of cycles analyzed is justified, therefore, the post-convergence period of the International Accounting Standard Board (IASB) standards was analyzed.

Since the present work intends to capture earnings management by both accruals and actual activities, the regression statistical models used were the Jones (1991) model for accrual management and Roychowdhury (2006) model for real activity management.

The Jones (1991) model starts from the assumption that the non-discretionary accruals are not constant over the time interval studied and, therefore, this model seeks to control the economic changes in the environment so that these changes do not affect the extent of non-discretionary accruals. To this end, the model attempts to control economic changes through the value of fixed assets, deferred charges and changes in revenues.

Therefore, we consider the Jones (1991) model to be adequate to verify the variation in the management level of the electric utilities, considering that, in PTR, ANEEL verifies, besides the operating costs, the remuneration of the investments that are mainly composed, for the investments. In addition, managers can choose either management through actual activities or discretionary additions. Manipulation by accruals is easier for regulators to detect, and the year-end deficit between unmanaged profits and the desired limit may exceed the value by which it is possible to manipulate accumulated values (Roychowdhury, 2006). Therefore, an actual activity management analysis is also performed.

The equation used in the Jones (1991) model for the calculation of non-discretionary accruals is:

$$NDA_{it} = \alpha \left(\frac{1}{A_{t-1}} \right) + \beta_1(\Delta R_{it}) + \beta_2(PPE_{it}) \quad (1)$$

Being that:

NDA_{it} = non-discretionary accruals of company i in period t ;

ΔR_{it} = change in revenue of firm i from period $t-l$ to period t ;

PPE_{it} = balances of Fixed Assets and Deferred Assets (gross) company i at the end of period t , weighted by total assets at the end of period $t-l$;

A_{t-1} = total assets of enterprise at end of period $t-l$;

α, β_1 e β_2 = estimated regression coefficients by equation 2.

Thus, to measure the parameters of the models α, β_1 e β_2 the following equation is used:

$$TA_{it} = \alpha \left(\frac{1}{A_{t-1}} \right) + \beta_1(\Delta R_{it}) + \beta_2(PPE_{it}) + V_{it} \quad (2)$$

Being that:

TA_{it} = total accruals of firm i in period t , weighted by total assets at the end of period $t-l$;

ΔR_{it} = change in revenue of firm i from period $t-l$ to period t , weighted by total assets at the end of period $t-l$;

PPE_{it} = account balances of Fixed Assets and Deferred Assets (gross) of Company i at the end of period t , weighted by total assets at the end of period $t-l$;

ΔR_{it} = total assets of enterprise at end of period $t-l$;

PPE_{it} = regression error (residuals).

A_{t-1} = company total assets at end of period $t-1$;
 V_{it} = regression error (residuals).

Finally, we have that abnormal discretionary accruals can be considered as the regression (residual) or equation 2 error V_{it} .

In addition to this model, Roychowdhury's (2006) model is also used to verify management through real activities.

Thus, the model used by Roychowdhury (2006) for expenses is:

$$\frac{DISEXP_t}{A_{t-1}} = \alpha_0 + \alpha_1 \left(\frac{1}{A_{t-1}} \right) + \beta \left(\frac{S_{t-1}}{A_{t-1}} \right) + \varepsilon_t \quad (3)$$

On what:

$DISEXP_t$ = discretionary expenditure in period t ;

A_{t-1} = total assets in period $t-1$;

S_{t-1} = sales in period $t-1$;

ε_t = estimated error (residuals).

Also, Roychowdhury's (2006) model was used for Costs of Goods Sold:

$$\frac{PROD_t}{A_{t-1}} = \alpha_0 + \alpha_1 \left(\frac{1}{A_{t-1}} \right) + \beta_1 \left(\frac{S_t}{A_{t-1}} \right) + \beta_2 \left(\frac{\Delta S_t}{A_{t-1}} \right) + \beta_3 \left(\frac{\Delta S_{t-1}}{A_{t-1}} \right) + \varepsilon_t \quad (4)$$

On what:

$PROD_t$ = cost of goods sold;

ΔS_t = sales at t - sales at $t-1$.

In addition, Roychowdhury's (2006) Cash Flow from Operations model was used:

$$\frac{CFO_t}{A_{t-1}} = \alpha_0 + \alpha_1 \left(\frac{1}{A_{t-1}} \right) + \beta_1 \left(\frac{S_t}{A_{t-1}} \right) + \beta_2 \left(\frac{\Delta S_t}{A_{t-1}} \right) + \varepsilon_t \quad (5)$$

On what:

CFO_t = cash flow from operations.

For the Periodic Tariff Review variable, we considered the fiscal year prior to the publication of the result as a period prior to PTR and the others as periods not prior to PTR, which may be: year of PTR, year after PTR or two years after the PTR.

The model used to capture earnings management by accruals and actual activities (equation 6) assumes that the Earnings Management variable will be calculated by the Jones (1991) and Roychowdhury (2006) models. The PTR variable is investigated in several periods (before and after the review) and the controls are described in Figure 1.

$$Earnings\ Management_{it} = \beta_0 + \beta_1 RTP_{it} + \sum_{j=1}^n \alpha(j) control_{it}^j + \varepsilon_{it} \quad (6)$$

Therefore, the regression coefficients for the years prior to PTR are expected to be negative for *accruals*, positive for actual activities with respect to the Cash Flow from Operations, Cost of Goods Sold model and negative for the Discretionary Expenses, inferring that companies manage results to decrease its own results to get better tariffs. Therefore, it is expected that the coefficients above will be reversed in the years after PTR so that the distributors manage their results upwards.

Control variables were included in the model since the literature has already provided evidence that they possibly interfere with the dependent variable (Earnings Management).

Thus, for the size variable, it is expected that the larger the firm, the greater the chance that the firm will decrease its results to report lower gains (Watts & Zimmerman, 1986). On the other hand, a greater relationship between sales and the company's total assets may generate a greater chance for earnings management (Roychowdhury, 2006).

| Variable | Description | Source |
|---------------------------|--|-----------------------------|
| Accruals | Measured according to the Jones model (1991). | Jones (1991) |
| Cash Flow from Operations | Calculated using Roychowdhury's model (2006). | Roychowdhury (2006) |
| Discretionary Expenses | Calculated using Roychowdhury's model (2006). | Roychowdhury (2006) |
| Cost of Goods Sold | Calculated using Roychowdhury's model (2006). | Roychowdhury (2006) |
| Periodic Tariff Review | Being 0 for years of non Periodic Tariff Review and 1 for year of Periodic Tariff Review. | Daily Official of the Union |
| Size | Total assets of the company in natural logarithm. | B3 |
| Sales/TA | Net revenue divided by total assets. | B3 |
| Corporate governance | Degree of corporate governance in B3 being 1 for firms that have governance and 0 for firms that do not. | B3 |
| Sales growth | Ratio of sales between t1 and t0 in decimal. | B3 |
| Leverage | Operational Leverage (taken from <i>Economática</i>). | B3 |
| Return on The active | Relationship between Net Income and Total Assets. | B3 |

Figure 1. Description of Variables and Their Controls and Sources

Also, including the company in B3's corporate governance levels reduces the chances of earnings management (Martinez, 2009). Regarding sales growth, the fastest-growing companies tend to further diminish its results (Watts & Zimmerman, 1986). On the other hand, the most leveraged companies tend to manage earnings more so as not to violate early debt maturity clauses (Watts & Zimmerman, 1986). Return on Assets was included as a control in the model, as it is possible that errors in estimates correlate with the company performance (Dechow, 1995).

4 RESULTS ANALYSIS

4.1 Presentation of Results

The number of observations analyzed between 2010 and 2016 was 208, and the maximum number of observations occurred in 2012 and 2013 with a total of 31. Furthermore, it is noteworthy that the observations of one year depend on variables from previous years for both the Jones (1991) and Roychowdhury (2006) models.

The descriptive statistics of both dependent and independent variables (Table 1) show the 4 dependent variables (Accruals, Cash Flow, Cost of Goods Sold and Discretionary Expense), in addition to the main independent variable (Periodic Tariff Review) and other independent control variables.

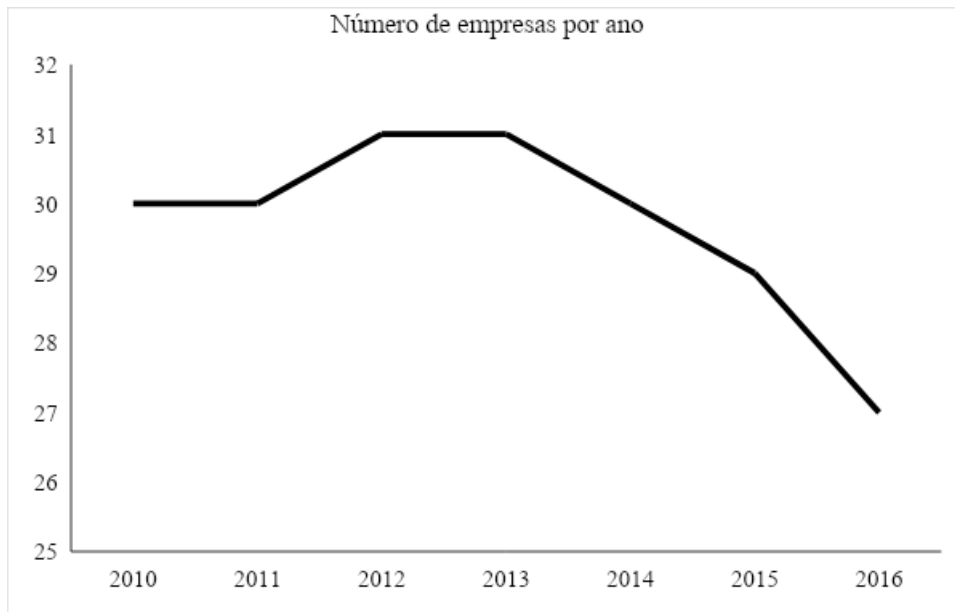


Figure 2. Number of Companies Analyzed from 2010 to 2016

As for the descriptive statistics of the variables, it is pointed out that the main independent variable (PTR) has an average of 0.24 and sets the average period of 4-year review of the companies, since the value of 1 is granted for this dummy variable for PTR years and 0 for the non-PTR years. Thus, on average, in 24% of the period analyzed, companies go through the tariff review. Regarding Corporate Governance, it is noted that 24% of the observations have some level of governance in the B3 criteria. It is noted that the leverage of electricity distributors varies greatly in the sample, with a standard deviation of 11.96, average set at 33.33 and its minimum and maximum at 11.96 and 59.10, respectively.

Similarly, the Revenue/Asset ratio shows a remarkable variation since, although the mean and median of these variables are close, there is a discrepancy between their maximum and minimum values, ranging from 1.15 to 0.07. Finally, it is observed that the revenue grew on average 11% during the period.

From the correlation coefficients between the variables (Table 2) it is extracted that the Size variable correlates with the 4 dependent variables of earnings management, even though it is a weak link. Therefore, it is asserted that larger companies tend to manage their results more because they are more politically exposed (Watts & Zimmerman, 1986).

The Periodic Tariff Review variable correlates negatively with the Revenue Growth and Leverage variables and positively with the accruals variable. Also, it is noted a negative correlation between the dependent variables Cost of Goods Sold and Discretionary Expenses of earnings management. Continually, Table 2 shows the negative correlation between the Cash Flow and accruals variables at -0.4715 at a 1% significance level.

Given that the Tariff Review occurs on average every 4 years, and may vary from 3 to 5 years, Table 3 shows the dummy variable PTR delayed by one year, i.e. indicating that there is PTR next year. In this regression, the main independent variable PTR was not statistically significant in any of the 4 models; however, some control variables have levels of significance and signs corresponding to those already reported in the literature.

Return on Assets results diverge from what was expected. Although distributors were supposed to decrease their results in the year before PTR, the ROA variable presents a different sign than expected in the accruals and COGS models, since in these two regressions the variables contribute to increase earnings management.

Table 1
Descriptive Statistics of Dependent and Independent Variables

| Variable | Average | Medium | Standard Deviation | Minimum | Maximum |
|------------------------|---------|--------|--------------------|---------|---------|
| Accruals | -0,01 | -0,01 | 0,05 | -0,17 | 0,20 |
| Cash flow | -0,01 | -0,01 | 0,07 | -0,16 | 0,27 |
| Cost of Goods Sold | 0,02 | 0,02 | 0,08 | -0,36 | 0,23 |
| Discretionary Expenses | -0,01 | -0,02 | 0,05 | -0,08 | 0,52 |
| Periodic Tariff Review | 0,23 | 0,00 | 0,42 | 0,00 | 1,00 |
| Governance | 0,24 | 0,00 | 0,43 | 0,00 | 1,00 |
| Leverage | 33,33 | 32,75 | 11,96 | 4,90 | 59,10 |
| Size | 15,42 | 15,27 | 0,84 | 13,01 | 17,56 |
| Revenue/Asset | 0,70 | 0,73 | 0,20 | 0,07 | 1,15 |
| Revenue Growth | 1,11 | 1,10 | 0,21 | 0,22 | 2,93 |
| ROA Growth | -0,01 | -0,01 | 0,05 | -0,17 | 0,46 |

On the other hand, when considering the PTR dummy in the review year (Table 4) in the regression, the results suggest that there is some management in both accruals and COGS. Since these data are published by the companies after the end of the year, i.e. after the tariff is set, there is a tendency for earnings management to increase them, as it is assumed that the result of the year of establishment electricity tariff will not influence the Regulatory Agency in determining the present revision.

In the next table we will consider the PTR variable in the year prior to the Periodic Tariff Review (Table 5), that is, we study earnings management one year after the PTR. The PTR variable manifests no significance level in any regression model. It is noteworthy that the Size variable has statistical significance in 6 regression models (the 4 models of the study are all with and without Fixed Company Effect), concluding that this variable is significant for the model. In the year after PTR, it is expected that companies will manage results upwards in this year, since managers have no incentive to decrease results in order for ANEEL to grant them a higher tariff adjustment.

In addition, in Table 5 the effect on the average of the variable Return on Assets is considerable, reaching a positive value of 0.507 in the Accruals model with an Fixed Company Effect significance at 1% level. It may be noted that this year, given the little incentive to manage the results downwards, managers are encouraged to manage investments by energy utilities. Thus, we infer that investments decrease in this period since they will be remunerated, between one revision and another, by official indexes. Thus, the remuneration base investments will be determined in the next PTR.

And finally, when considering management within 2 years after PTR, as shown in Table 6, it is found that there is again management in accruals and COGS. Moreover, it is observed that the signals of the PTR variable for both models are inverted compared to the signal presented in the period of the PTR year, seen in Table 4.

Table 2
Correlation Matrix of Variables

| Variables | Accruals | co 1 - flow | Cash flow | COGS | Discretionary Expenses | PTR | Governance | Leverage | Size | Revenue/Assets | Revenue Growth | ROA Growth |
|------------------------|-------------|-------------|-------------|-------------|------------------------|-------------|------------|-----------|------------|----------------|----------------|------------|
| <i>Accruals</i> | 1,0000 | | | | | | | | | | | |
| Cash flow | -0.4715 *** | 1,0000 | | | | | | | | | | |
| COGS | -0.0557 | -0.6200 *** | 1,0000 | | | | | | | | | |
| Discretionary Expenses | -0.2172 *** | -0.0351 | -0.4072 *** | 1,0000 | | | | | | | | |
| PTR | 0.1474 ** | -0.0295 | -0.0697 | -0.0664 | 1,0000 | | | | | | | |
| Governance | 0.1813 *** | -0.0722 | 0.1129 | -0.1081 | 0.0522 | 1,0000 | | | | | | |
| Leverage | -0.041 | 0.0349 | -0.1581 ** | 0.087 | -0.1177 * | -0.2737 *** | 1,0000 | | | | | |
| Size | 0.2182 *** | -0.2640 *** | 0.2862 *** | -0.2815 *** | 0.0369 | 0.4670 *** | -0.0492 | 1,0000 | | | | |
| Revenue/Assets | -0.0731 | -0.1843 *** | 0.1997 | 0.098 | -0.0127 | -0.3504 *** | 0.0873 | -0.0629 | 1,0000 | | | |
| Revenue Growth | -0.0457 | -0.0495 | -0.1116 | 0.2084 *** | -0.1603 ** | 0.0459 | -0.0577 | -0.0442 | 0.071 | 1,0000 | | |
| ROA Growth | 0.2390 *** | -0.0447 | -0.0678 | -0.039 | -0.0506 | 0.0429 | -0.0093 | -0.1289 * | -0.1449 ** | 0.2138 *** | 1,0000 | |

Note: COGS - Cost of Goods Sold; PTR - Periodic Tariff Review;

ROA Growth - Return on Assets Growth .

* Significance at 10% level.

** Significance at 5% level.

*** Significance at 1% level.

Table 3
Regressions on Management in the Year Prior to PTR

| Variables | Accruals (1) | Cash flow (1) | COGS (1) | Discretionar y Expenses (1) | Accruals (2) | Cash flow (2) | COGS (2) | Discretionar y Expenses (2) |
|--------------------------------|---------------------|---------------------|---------------------|-----------------------------------|---------------------|---------------------|--------------------|-----------------------------------|
| PTRt+1 | 0,0004 (0,965) | 0,0086 (0,306) | -0,0053 (0,596) | -0,0060 (0,383) | 0,0041 (0,593) | 0,0088 (0,260) | -0,0056 (0,545) | -0,0056 (0,425) |
| Governance | 0,0087 (0,375) | -0,0122 (0,516) | 0,0085 (0,710) | 0,021 (0,286) | 0 (.) | 0 (.) | 0 (.) | 0 (.) |
| Leverage | 0,0004 (0,231) | -0,0001 (0,810) | - 0,0013** | 0,0009* (0,084) | 0,0001 (0,936) | - 0,0013 | -0,0008 (0,423) | 0,0016** (0,032) |
| Size | 0,0117** (0,011) | -0,015* (0,089) | 0,0208* (0,052) | -0,0241*** (0,008) | -0,0071 (0,813) | 0,033 (0,278) | -0,0226 (0,534) | -0,0434 (0,114) |
| Revenue/Assets | 0,0199 (0,266) | - 0,0752** | 0,022 (0,556) | 0,0229 (0,445) | -0,0084 (0,889) | 0,0209 (0,732) | -0,135* (0,066) | 0,0098 (0,858) |
| Revenue Growth | - 0,139*** | 0,0364 (0,221) | 0,016 (0,652) | 0,110*** (0,000) | - 0,168*** | 0,0006 (0,988) | 0,0744* (0,092) | 0,122*** (0,000) |
| ROA Growth | 0,339*** (0,000) | 0,0696 (0,418) | -0,229** (0,024) | -0,0458 (0,515) | 0,322*** (0,000) | 0,0959 (0,243) | - 0,252** | -0,0499 (0,498) |
| Constant | -0,0733 (0,345) | 0,288** (0,032) | -0,339** (0,037) | 0,193 (0,159) | 0,277 (0,546) | -0,434 (0,347) | 0,348 (0,528) | 0,462 (0,267) |
| Fixed Effect | Year Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| No. of Observations | 176 | 176 | 176 | 176 | 176 | 176 | 176 | 176 |
| Adjusted R² | - | - | - | - | 0,393 | 0,461 | 0,435 | 0,206 |

Note: (1) No Fixed Company Effect; (2) With Fixed Company Effect; COGS - Cost of Goods Sold; PTR - Periodic Tariff Review with one year lag; ROA growth- Return on Assets Growth . PTRt-1 = one year before; PTRt = in the same year; PTRt + 1 = one year later; PTRt + 2 = two years later . * Significance at 10% level. ** Significance at 5% level. *** Significance at 1% level.

Table 4
Regressions on Management in the PTR Year

| Variables | Accruals (1) | Cash flow (1) | COGS (1) | Discretion ary Expenses (1) | Accruals (2) | Cash flow (2) | COGS (2) | Discretio nary Expense s (2) |
|--------------------------------|-------------------------|------------------------------|---------------------|--|-------------------------|--------------------------|---------------------|---|
| PTRt | 0,0157* | -0,0038 | -0,0230** | -0,0013 | 0,0171** | -0,0010 | -0,0264*** | -0,0012 |
| | (0,068) | (0,636) | (0,021) | (0,837) | (0,042) | (0,891) | (0,004) | (0,855) |
| Governance | 0,0082 | -0,0089 | -0,0048 | 0,0115 | -0,0611 | 0,118* | -0,0894 | -0,0014 |
| | (0,414) | (0,617) | (0,804) | (0,468) | (0,385) | (0,063) | (0,240) | (0,980) |
| Leverage | 0,0000 | -0,0008* | -0,0007 | 0,0006 | 0,0007 | -0,0023*** | 0,0003 | 0,0010 |
| | (0,929) | (0,095) | (0,192) | (0,118) | (0,364) | (0,002) | (0,753) | (0,100) |
| Size. | 0,0131*** | -0,0124 | 0,0213** | -0,0168** | -0,0685** | 0,0413 | 0,0285 | -0,0133 |
| | (0,005) | (0,136) | (0,018) | (0,022) | (0,022) | (0,124) | (0,375) | (0,564) |
| Revenue/Assets | 0,00231 | -0,0457 | 0,0129 | 0,03 | -0,106* | 0,00857 | -0,0148 | 0,0439 |
| | (0,899) | (0,129) | (0,698) | (0,247) | (0,081) | (0,875) | (0,821) | (0,351) |
| Revenue Growth | -0,0135 | -0,0091 | -0,0697*** | 0,0504*** | 0,0243 | -0,0393* | -0,0538** | 0,0449** |
| | (0,470) | (0,632) | (0,002) | (0,001) | (0,317) | (0,074) | (0,041) | (0,018) |
| ROA Growth | 0,293*** | -0,0505 | -0,0669 | -0,120** | 0,415*** | 0,0732 | -0,271*** | -0,109 |
| | (0,000) | (0,466) | (0,420) | -0,032 | (0,000) | (0,347) | (0,004) | (0,105) |
| Constant | -0,229*** | 0,304** | -0,248* | 0,155 | 1,037** | -0,495 | -0,372 | 0,0909 |
| | (0,002) | (0,016) | (0,071) | -0,165 | -0,028 | (0,244) | (0,465) | (0,804) |
| Fixed Year Effect | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| No. of Observations | 208 | 208 | 208 | 208 | 208 | 208 | 208 | 208 |
| Adjusted R² | | | | | 0,282 | 0,434 | 0,454 | 0,152 |

Note: (1) No Fixed Company Effect; (2) With Fixed Company Effect; COGS - Cost of Goods Sold; PTR - Periodic Tariff Review; ROA Growth - Return on Assets Growth . PTRt-1 = one year before; PTRt = in the same year; PTRt + 1 = one year later; PTRt + 2 = two years later . * Significance at 10% level. ** Significance at 5% level. *** Significance at 1% level.

Table 5
Regressions on Management in the Subsequent Year to PTR

| Variables | Accruals (1) | Cash flow (1) | COGS (1) | Discretionary Expenses (1) | Accruals (2) | Cash flow (2) | COGS (2) | Discretionary Expenses (2) |
|-------------------------------|-------------------------|--------------------------|----------------------|---------------------------------------|-------------------------|--------------------------|---------------------|---------------------------------------|
| PTRt-1 | 0,0070 (0,472) | -0,0012 (0,895) | -0,0057 (0,524) | 0,0019 (0,578) | 0,0095 (0,315) | -0,0039 (0,643) | -0,0056 (0,514) | 0,0021 (0,500) |
| Governance | 0,0054 (0,622) | -0,0023 (0,894) | -0,0091 (0,609) | 0,0022 (0,812) | -0,0826 (0,254) | 0,120* (0,065) | -0,0358 (0,586) | -0,0091 (0,705) |
| Leverage | 0,0001 (0,745) | -0,0003 (0,549) | 0,00145** (0,005) | 0,0002 (0,523) | 0,00156* (0,095) | 0,0026** (0,002) | 0,0006 (0,464) | -0,0004 (0,254) |
| Size | 0,0140* (0,007) | 0,0208* (0,013) | 0,0307*** (0,000) | -0,0139*** (0,002) | 0,0686* (0,039) | 0,0332 (0,259) | 0,0586* (0,052) | -0,0169 (0,126) |
| Revenue/Assets | 0,0149 (0,475) | 0,0775* (0,020) | 0,0438 (0,189) | 0,0072 (0,675) | -0,0507 (0,486) | 0,0124 (0,848) | -0,0214 (0,746) | -0,0001 (0,997) |
| Revenue Growth | -0,0216 (0,294) | -0,010 (0,614) | -0,0418** (0,037) | 0,0145* (0,070) | 0,038 (0,156) | 0,0495** (0,039) | -0,0377 (0,122) | 0,0151* (0,092) |
| ROA Growth | 0,520** (0,000) | 0,0131 (0,880) | -0,434*** (0,000) | -0,0339 (0,317) | 0,507** (0,000) | 0,0411 (0,630) | 0,387** (0,000) | -0,0461 (0,149) |
| Constant | -0,209** (0,011) | 0,417** (0,001) | -0,438*** (0,001) | 0,168** (0,016) | 1,007* (0,057) | -0,383 (0,415) | -0,883* (0,066) | 0,240 (0,174) |
| Fixed Year Effect | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| No. of Observations | 176 | 176 | 176 | 176 | 176 | 176 | 176 | 176 |
| Adjusted R² | | | | | 0,31 | 0,378 | 0,535 | 0,208 |

Note: (1) No Fixed Company Effect; (2) With Fixed Company Effect; COGS - Cost of Goods Sold; PTR - Periodic Tariff Review one year after the review; ROA Growth- Return on Assets Growth . * Significance at 10% level. ** Significance at 5% level. *** Significance at 1% level.

Table 6
Regressions on Management in the 2nd Subsequent Year to PTR

| Variables | Accruals (1) | Cash flow (1) | COGS (1) | Discretion ary Expenses (1) | Accruals (2) | Cash flow (2) | COGS (2) | Discretion ary Expenses (2) |
|-------------------------------------|-------------------------|------------------------------|-----------------------|--|--------------------------|--------------------------|---------------------------|--|
| PTRt-2 | -0,0235** (0,023) | 0,0092 (0,339) | 0,0202** (0,029) | -0,0037 (0,321) | - 0,0236** (0,020) | 0,0105 (0,241) | 0,0178** (0,036) | -0,0032 (0,371) |
| Governance | 0,0075 (0,579) | -0,0067 (0,726) | -0,0077 (0,686) | 0,0017 (0,877) | -0,0966 (0,197) | 0,101 (0,130) | 0,0587 (0,348) | -0,0112 (0,677) |
| Leverage | 0,0001 (0,723) | -0,0002 (0,681) | -0,0018*** (0,002) | 0,0002 (0,594) | 0,0014 (0,215) | -0,0034*** (0,001) | 0,0010 (0,287) | -0,0003 (0,459) |
| Size | 0,0137** (0,035) | - 0,0220** (0,017) | 0,0369*** (0,000) | -0,0145*** (0,008) | - 0,0917** (0,014) | 0,0293 (0,376) | 0,126*** (0,000) | -0,0202 (0,133) |
| Revenue/As sets | 0,0099 (0,708) | - 0,108*** (0,005) | 0,0787** (0,039) | 0,0043 (0,843) | -0,0076 (0,935) | -0,0788 (0,343) | 0,102 (0,192) | -0,0107 (0,749) |
| Revenue Growth | 0,0054 (0,797) | -0,0147 (0,475) | -0,0620*** (0,002) | 0,0138 (0,106) | 0,0614** (0,040) | -0,0441* (0,097) | - 0,0932*** (0,000) | 0,0169 (0,114) |
| ROA Growth | 0,451*** (0,000) | 0,0363 (0,694) | -0,405*** (0,000) | -0,0441 (0,224) | 0,397*** (0,000) | 0,0748 (0,414) | -0,308*** (0,000) | -0,0595 (0,110) |
| Constant | -0,230** (0,022) | 0,434*** (0,002) | -0,480*** (0,001) | 0,193** (0,022) | 1,321** (0,027) | -0,262 (0,620) | -1,929*** (0,000) | 0,307 (0,153) |
| Fixed Year Effect | Sim | Sim | Sim | Sim | Sim | Sim | Sim | Sim |
| No. of Observatio ns | 145 | 145 | 145 | 145 | 145 | 145 | 145 | 145 |
| Adjusted R² | | | | | 0,363 | 0,363 | 0,541 | 0,232 |

Note: (1) No Fixed Company Effect; (2) With Fixed Company Effect; COGS - Cost of Goods Sold; PTR - Periodic Tariff Review two years after the review; ROA Growth - Return on Assets Growth . * Significance at 10% level. ** Significance at 5% level. *** Significance at 1% level.

Figures 3 and 4 show the signals of the four variables for the proposed models with and without the Fixed Company Effect, respectively. Fixed Company Effect regressions may include unobservable variables at the company level. Thus, its results may consider some omitted variables when discarding the fixed effect.

The findings shown in the previous figures, taking into account the variable of interest (periodic tariff review) indicate that in the tariff review year there is a greater generation of accruals. However, accruals are diminished 2 years after the review period. For both models,

with and without fixed company effect, these results can be understood as a cyclical mechanism by which companies increase their results and reverse them 2 periods ahead. On the other hand, when analyzing earnings management through operating activities, the fact that it is the year of tariff revision is a negative factor and its compensation occurs 2 years later, following the cyclical behavior explained above.

| NO FIXED EFFECT | | | | | | | | | | | | | | | | |
|------------------------|----------|---|-----|-----|-----------|---|-----|-----|------|---|-----|-----|----------|---|-----|-----|
| Variable | Models | | | | | | | | | | | | | | | |
| | Accruals | | | | Cash flow | | | | COGS | | | | Expenses | | | |
| Year | T-1 | T | T+1 | T+2 | T-1 | T | T+1 | T+2 | T-1 | T | T+1 | T+2 | T-1 | T | T+1 | T+2 |
| Periodic Tariff Review | | + | | - | | | | | | - | | + | | | | |
| Governance | | | | | | | | | | - | | | | | | |
| Leverage | | | | | | - | | | | - | - | - | + | | | |
| Size | + | + | + | + | - | | - | - | + | + | + | + | - | - | - | - |
| Revenue/Assets | | | | | - | | - | - | | | + | | | | | |
| Revenue Growth | - | | | | | | | | - | - | - | - | + | + | + | |
| ROA Growth | + | + | + | + | | | | | - | | - | - | | - | | |

Figure 3. No Fixed Company Effect

Note: + Statistically significant and with positive sign. - Statistically significant and with negative sign.

| NO FIXED EFFECT | | | | | | | | | | | | | | | | |
|------------------------|----------|---|-----|-----|-----------|---|-----|-----|------|---|-----|-----|----------|---|-----|-----|
| Variable | Models | | | | | | | | | | | | | | | |
| | Accruals | | | | Cash flow | | | | COGS | | | | Expenses | | | |
| Year | T-1 | T | T+1 | T+2 | T-1 | T | T+1 | T+2 | T-1 | T | T+1 | T+2 | T-1 | T | T+1 | T+2 |
| Periodic Tariff Review | | + | | - | | | | | | - | + | | | | | |
| Governance | | | | | | | + | | | | | | | | | |
| Leverage | | | + | | | - | - | - | | | | + | | | | |
| Size | | - | - | - | | | | | | + | + | | | | | |
| Revenue/Assets | | - | | | | | | | - | | | | | | | |
| Revenue Growth | - | + | | + | | - | - | - | + | - | | - | + | + | + | |
| ROA Growth | + | + | + | + | | | | | - | - | - | - | | | | |

Figure 4. With Fixed Company Effect

Note: + Statistically significant and with positive sign. - Statistically significant and with negative sign.

Based in the event that the result of years of establishing the electricity tariff will not influence the regulatory agency in the determination of this review because ANEEL uses regulatory data over accounting data, these relations can be explained by the hypothesis of the political costs. Companies manage through accruals or actual activities to show that these are performing better in the year of tariff review if we understand PTR as setting a new benchmark to be achieved.

These results can be explained by the negative relationship between discretionary accruals through accounting choices for the preparation of financial results and the management of results through actual activities. According to Paulo (2007), in his findings, when considering earnings management through accruals controlling by including earnings management proxies through operating activities, there is an inverse relationship.

4.2 Results Discussion

Regarding the number of companies per year, the sample is heterogeneous, with the lowest observation point in 2016 with 27 companies (Figure 2). The limited number of electric utility companies in B3 is explained by the long periods of concession contracts that can be up to 30 years, and many electric utility companies do not own shares in B3.

Regarding the results, only 24% of the sample possessed some level of corporate governance, the corporate governance variable was not significant for any of the types of management results. These results, may even seem contradictory, however as exposed by Martinez (2013): "*The single listing in a special segment of corporate governance in recent years does not necessarily mean a weaker tendency towards earnings management*". On the other hand, since the higher the leverage, the larger the possibilities for earnings management (Watts & Zimmerman, 1986), it can be inferred that, given the results and for being the same segment (electricity distribution), this variation cannot be a factor that influences manipulation.

Similarly, considering that distributors are companies that necessarily have a large part of their assets fixed and that investments are one of the main factors of PTR, this variation in the amount of total assets may represent more or less earnings management between periods either through investment or revenue.

With respect to correlations, as variable PTR correlates negatively with the variables Revenue Growth and Leverage and positively with the variable accruals, it can be inferred that in the PTR year, the Revenue and Leverage decreases as discretionary accruals increase. The negative correlation between COGS and Discretionary Expenses, can explain why companies tend to decrease COGS given by incentive regulation, increasing the Expenditure for the purposes of disclosing smaller gains (Roychowdhury, 2006).

Finally, the fact that the negative correlation between Cash Flow from Operations and accruals is due to the fact that companies are again managing through Real Activities and accruals at the same time, and some manipulation methods have a positive effect on accruals and a negative effect on Cash Flow (Roychowdhury, 2006). These results can be understood in the energy sector since the proportion in which management has control is over the B portion.

Considering the Fixed Company Effect models, abnormal discretionary accumulations showed expected signs for the PTR variable, inferring that, on average, companies tend to increase discretionary accruals in the year of pricing and compensate these increases 2 years later. The variables Size and Revenue on Assets showed signs according to the literature, given that larger companies tend to have lower levels of discretionary accruals (Almeida & Queiroz, 2017).

Revenue Growth showed a negative sign for the accruals model and positive for the COGS model when considering the Fixed Company Effect, deducing that, on average, companies manage revenues to decrease results in the year prior to PTR through these variables, according to the expected hypothesis. It follows that companies tend to reduce their revenue in years prior to the review in order to contribute with a lower result.

From the COGS model, it is observed that in the PTR year, on average, the distributors manage the results upwards, since the negative sign in the PTR variable is denoted. It appears that the management in this case is to reduce the result, since the concessionaires are companies monitored by ANEEL and also politically exposed by the type of service they provide.

Therefore, this corroborates the hypothesis of the different behaviors in the charging and uncharging periods, since PTR's data for two years later are closer to the new analysis for the next ANEEL charging and, therefore, are subject to further judicious investigation by the regulator.

Of the control variables, it is noted that Size, Revenue Growth and Return on Asset Growth were statistically different from zero in the accruals and COGS models when considering the Fixed Company Effect. It is observed that the signals are perfectly inverse in both models, since the management of results by discretionary accumulations and cost of abnormal products evidently occurs inversely and, in this case, with a focus on reducing the result, i.e., confirming the hypothesis that companies manage, on average, the result in order to claim a better rate.

Generally speaking, there is some evidence of management, however slight. This fact can be justified by the strong regulation that these companies are subject to, either by the National Electric Energy Agency and the Securities Commission, as well as their high political costs, as they are politically exposed companies that depend on controlled prices for the composition of their companies' revenue. In addition, these companies are monitored not only by the regulator but also by their investors as they are publicly traded.

5 CONCLUSION

This study adds knowledge to earnings management literature as it presents evidence of manipulation of results by electricity distribution companies listed on B3. Of course, depending on the incentive, managers have different *stimuli* to encourage themselves in manipulative activities. In general, companies manage to lower present results to report higher profits in the future, decrease profit if the company is politically exposed, increase profit seeking better bonuses and/or not break contract rules and reduce profit volatility through smoothing.

However, Electricity Distributors have incentives to increase profits in non-charging periods and to decrease profits in charging periods, based on the assumption of the sensitivity of this type of industry to political costs. Thus, it became clear that companies, on average, possessed a higher level of discretionary accruals in the year of billing and compensation takes place two years after the charging. These results can be explained because the data of the billing year will only be shown after the new tariff value established by ANEEL and will not influence the Agency. The increase in discretionary accruals in the year of PTR may be related to setting a new benchmark to be achieved after tariffs are set.

Therefore, this paper helps investors make better decisions on how and when to allocate their resources at the specific PTR event. We have as limitation of this paper the use of corporate and non-regulatory data. Therefore, the sample is limited to publicly traded companies. The other limitation refers to the choice of variables revenue growth and return on growth assets (ROA), because they are not entirely under the control of entities, but affect the other variables not considered in the study.

For future research it would be pertinent to analyze the causes of greater earnings management in the periods prior to the Periodic Tariff Review of the electricity distribution companies, as well as whether the higher or lower level of management influences the value of the tariff allowed by ANEEL.

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Alterações de Taxas e Gestão de Resultados nas Distribuidoras de Energia Elétrica Doméstica

RESUMO

Objetivo: Verificar se as empresas concessionárias de energia elétrica adotam práticas de gerenciamento de resultados (GR), em momentos anteriores e posteriores à Revisão Tarifária Periódica (RTP), a fim de obterem melhores tarifas, atraírem investidores e/ou pagar bonificações aos seus gestores.

Método: A amostra de este estudo é composta por todas as empresas concessionárias de energia elétrica da B3, cobrindo o período 2010-2016. Analisamos o impacto da RTP mediante o método de dados em painel.

Originalidade/Relevância: Analisou-se se o GR está relacionado à RTP, dado que o interesse do consumidor, do governo e dos investidores é diferente ao das empresas concessionárias no tocante ao valor da tarifa. Veja que os investidores podem tomar melhores decisões em como e quando alocar os seus recursos no evento específico da RTP.

Resultados: Notamos que, na média, as empresas gerenciam os seus resultados para cima após a RTP e para baixo nos anos de tarifação.

Contribuições Teóricas/Metodológicas: Os achados indicam que nos anos de revisão tarifária existe maior geração de accruals e diminuídos 2 anos após o RTP. Por outro lado, no GR (operacional) o comportamento cíclico é similar, mas a RTP é um fator negativo no ano da revisão tarifária e positivo dois períodos a frente.

Contribuições sociais para a gestão: Estes resultados são compreendidos desde que as empresas concessionárias sabem que o resultado do ano da RTP não influenciará a agência reguladora na determinação da revisão presente e os revertem 2 períodos a frente, no intuito de se antecipar para a próxima RTP.

Palavras-chave: Revisão Tarifária Periódica; Gerenciamento de resultados; Distribuidoras de energia elétrica.

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