

Trends of the Energy Market Reflection on the Capital Market in Romania

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Abstract

The study focuses on the implications of the changes occurring on the energy market, specifically on the electricity market, over the performances of the stocks of companies from the energy and utilities sector listed at the Bucharest Stock Exchange. The objective of the paper is to determine if there is a short-term correlation between electricity consumption and price, and the Bucharest Exchange Trading Energy and Related Utilities Index (BET-NG).

After performing a quantitative analysis of the competitive segment of the electricity retail market in Romania, and of the evolution of BET-NG, we used the Pearson’s correlation test to find if electricity consumption and price influence the trend of BET-NG.

Our findings suggest that there is a statistical correlation between the consumption on electricity and BET-NG. Electricity price also influences the index, but only in the case of non-household clients, while the price paid by households is not correlated to BET-NG.

Key words: electricity market, capital market, BET-NG, electricity price, Bucharest Stock Exchange

J.E.L. classification: G10

1. Introduction

Energy market, especially electricity and gas market, has been the topic of interest in the news for the last months. The media concentrated on the increasing price of utilities and its impact on the economy and on households. Our paper will try to look at the other side of the problem: the impact that the developments of the energy market, specifically of the electricity market, has on the stock market performances of the companies from the energy and utilities sector.

We formulated the following research question: does electricity consumption and price influence the stock market performances of energy and utilities companies?

To determine the answer to this question, after taking a short look at the previous writings related to the relationship between energy prices and the stock market, we choose four variables that characterize, in our opinion, the competitive sector of the electricity retail market and a variable for the evolution of the energy and utilities sector of the Bucharest Stock Exchange, and we used the Pearson’s correlation test to determine if there is a correlation between each electricity market variable and the stock market variable.

The results of the statistical correlation are discussed in the fourth part of the study. This chapter also includes a quantitative analysis of the electricity market in Romania and of the performances of the energy and utilities companies listed on the Main Market of the Bucharest Stock Exchange.

The conclusion that we reached after our research is that electricity consumption by non-household and household clients that have contracts for the supply of electricity on the competitive market, as well as the price of electricity for non-household clients on this market are statistically correlated in a positive way to the evolution of BET-NG, the Bucharest Stock Exchange index for the energy and utilities companies, while the price of electricity for households is not correlated to BET-NG.

2. Literature review

Energy prices, especially oil prices, play an important role on the evolution of the economy, because energy is used in all economic activities. Therefore, the impact of energy prices over the economy in general is an important research topic for a lot of authors. In the last decades, economists also became preoccupied with the impact of energy prices on the capital market's evolution.

Some studies concentrate on the relationship between energy price and the evolution of macroeconomic indicators in different regions. This studies mainly consider the link between crude oil price and gross domestic product. Oil price changes and macroeconomic indicators are considered to have an indirect relationship (Mussa, 2000, Lardic and Mignon, 2008, Jones et al., 2004), or an asymmetrical relationship (Anton, 1989; Clements and Krolzig, 2002). Other studies identify a positive or negative impact of oil price over the economy depending on whether the economy is oil exporting, oil importing or oil refining (Ha Le and Chang, 2015; Kilian and Park, 2009).

Another research direction that the literature shows is establishing the influence of oil price over the stock market. Some authors demonstrate the impact of energy prices over non-oil or non-gas stock returns. Studies such as Arouri and Nguyen (2010) suggest a negative and week influence of oil price over stock returns of non-oil and non-gas companies. For oil and gas companies, the influence is positive, as shown by Papapetrou (2001). Other authors focus on the connection between oil price movements and stock market indices. Apergis (2009) states that no statistical link between the two indicators can be establishes, so the stock market as a whole is not influenced by the changes of oil price, while Papapetrou (2001) considers that oil price movements can be used to explain the evolution of the stock market.

Other types of energy prices (gas and electricity) are considered to have a long-term effect on the capital market, the data series moving together. On short-term, gas price also affects the stock market, while electricity price is not corelated to stock market indices (Nakhipekova et al., 2020).

In the next chapter, we will try to verify the existence of a correlation between electricity price and the energy sectoral index of the Romanian capital market.

3. Research methodology

Our study focuses on determining if there is a relationship between the evolution of the electricity price and consumption in Romania and the performances of the energy sector companies on the capital market, on a short-term. In this context, we first conducted a quantitative analysis of the evolution of the competitive segment of the retail electricity market and on the performances of companies from the energy and utilities sector on the Bucharest Stock Exchange.

The data that we use cover the period between January 2019 and October 2021. For the electricity market indicators, we use the average monthly selling prices to final clients on the competitive market (broken down into non-household and household clients) and the monthly consumption of electricity by final clients on the competitive market, data provided by the Romanian Energy Regulatory Authority. For the capital market evolution, we use the monthly average BET-NG, the energy sector index of the Bucharest Stock Exchange, data taken from the Bucharest Stock Exchange monthly reports.

We considered the following variables:

- Non-household clients consumption (NHCC);
- Household clients consumption (HCC);
- Average selling price for non-household clients (APNHC);
- Average selling price for household clients (APHC);
- BET-NG monthly average (BET-NG).

In order to achieve our research objectives, we tested the following research hypotheses:

- H1: there is a positive correlation between BET-NG and NHCC;
- H2: there is a positive correlation between BET-NG and HCC;
- H3: there is a positive correlation between BET-NG and APNHC;
- H4: there is a positive correlation between BET-NG and APHC.

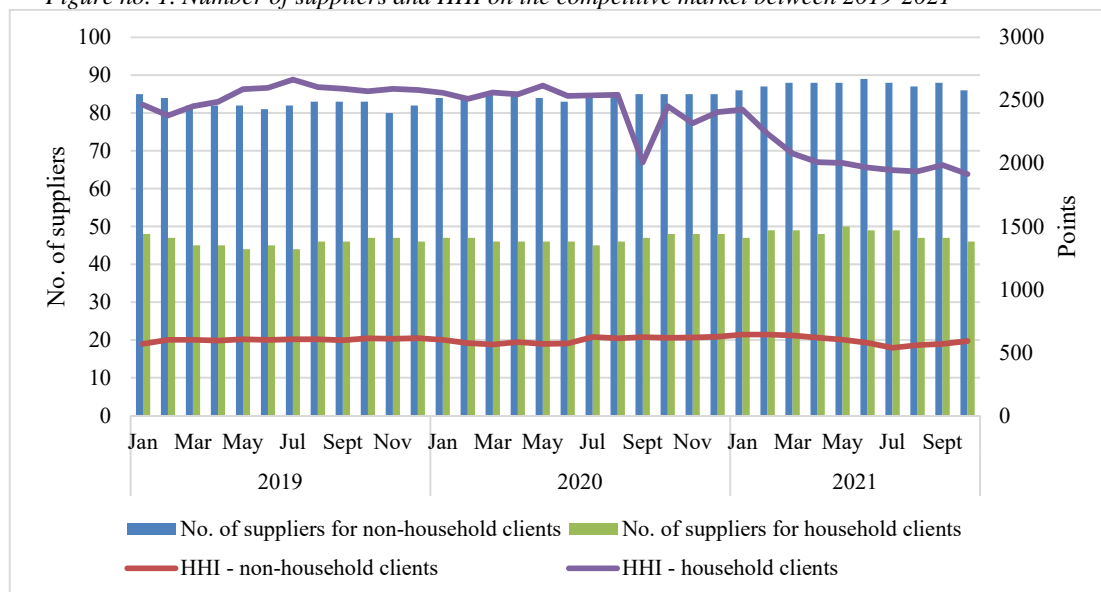
The Pearson’s correlation test was performed to check these hypotheses using the SPSS version 21 statistical software.

4. Findings

The competitive retail electricity market in Romania consists of two types of suppliers: competitive and last resort, and two types of final customers: supplied according to law provisions and supplied on the competitive market. Also, customers are separated into non-household and household clients, each category being divided into sub-categories based on the electricity consumption.

The number of suppliers ranged between 80 and 89 monthly for non-household clients, and between 44 and 50 for household clients, from January 2019 to October 2021. From a competitive point of view, the non-household clients segment can be considered a competitive one, based on the values of the Herfindahl-Hirschman Index (HHI), while the household clients segment appears to be have moderate to high levels of market concentration. Figure no. 1 presents the evolution of the number of suppliers for non-household and household clients and the evolution of the HHI for both segments between January 2019 and October 2021.

Figure no. 1. Number of suppliers and HHI on the competitive market between 2019-2021

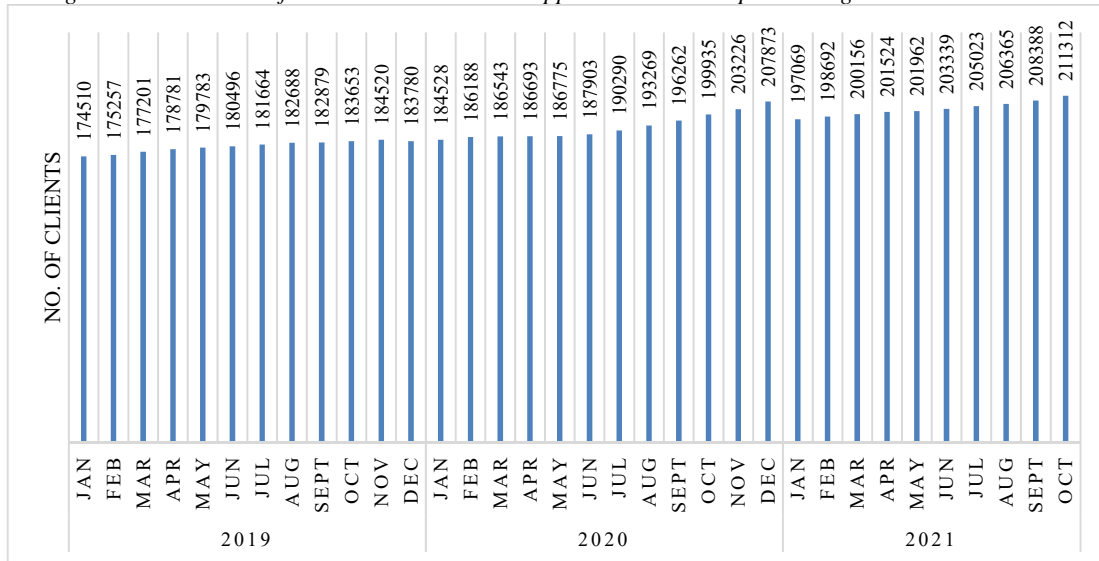


Source: Monthly reports of the Romanian Energy Regulatory Authority 2019-2021

The degree of concentration of the non-household segment remained relatively constant around 600 points, a level that shows the existence of a competitive market. For the household segment of the market, the values of HHI show the existence of a moderately concentrated market until April 2019, then a highly concentrated market until August 2020, and once again a moderate level of concentration from September 2020 until the end of the analyzed period. The process of market liberalization may lead to a more competitive market for household clients, as the trend of HHI shows.

Since January 1st, 2021, the Romanian electricity market was completely liberalized, in accordance with the UE Rules (2019/943). However, a competitive segment of the electricity market existed in Romania before 2021, the number of clients supplied under a competitive regime increasing every month. Figure no. 2 shows the evolution of the number of non-household clients supplied under a competitive regime since January 2019.

Figure no. 2. Number of non-household clients supplied under a competitive regime between 2019-2021

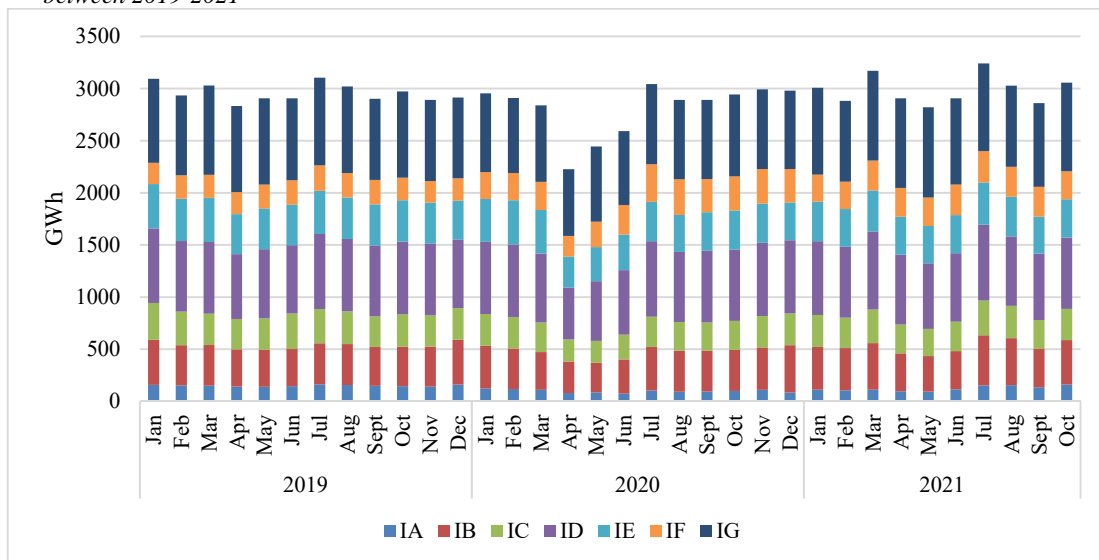


Source: Monthly reports of the Romanian Energy Regulatory Authority 2019-2021

The number of household customers that have a contract for the supply of electricity on the competitive market also increased during the analyzed period. At the end of July 2021, 4.9 million of such customers existed, representing 56% of the total number of clients, according to the Romanian Energy Regulatory Authority.

The consumption of electricity by non-household clients on the competitive market averaged around 3000 GWh monthly in the analyzed period (figure no. 3).

Figure no. 3. Monthly consumption of electricity by non-household clients on the competitive market between 2019-2021



Source: Monthly reports of the Romanian Energy Regulatory Authority 2019-2021

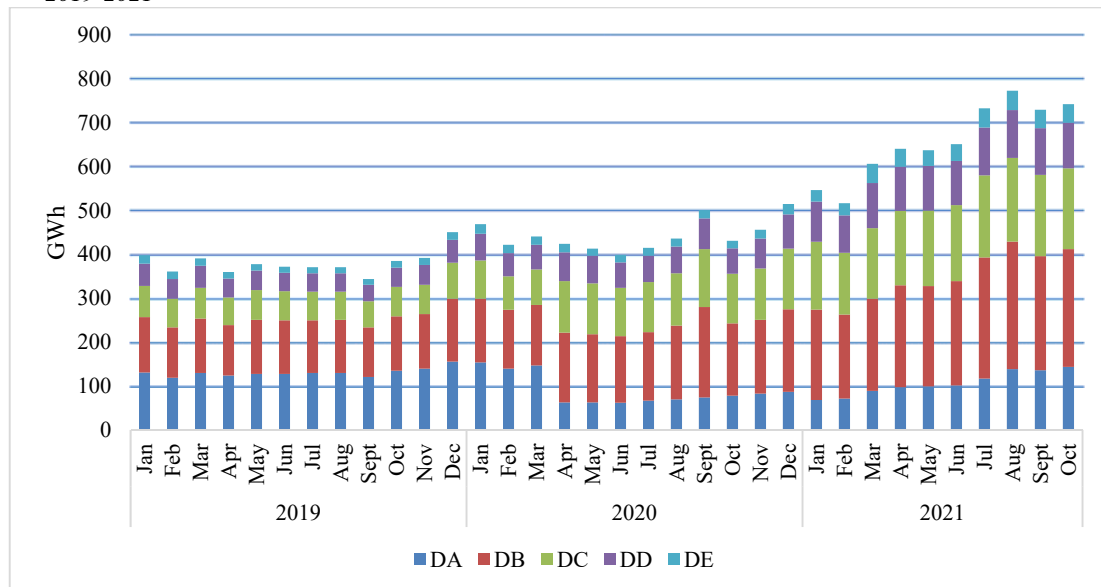
As we previously mentioned, non-household clients are divided into seven categories based on their annual electricity consumption, according to the provisions of EU Regulation no. 2016/1952 (IA – less than 20 MWh, IB – between 20 and 500 MWh, IC – between 500 and 2000 MWh, ID – between 2000 and 20000 MWh, IE – between 20000 and 70000 MWh, IF – between 70000 and 150000 MWh, and IG – more than 150000 MWh). Companies in the fourth and in the last category had the biggest electricity use during the analyzed period. In 2019, a total of 35.202 GWh were

sold to non-household clients on the competitive market. In 2020, we can note a decrease in the value of electricity consumption to 33.777 GWh, and in the first ten months of 2021, non-household clients used 29.879 GWh.

As expected, during the COVID-19 lockdown period, electricity consumption by non-household clients dropped, because a lot of businesses were closed. In April 2020, the lowest consumption was registered, followed by a minor comeback in the next months.

The electricity consumption of household clients on the competitive market on the other hand, manifests an upward trend during the analyzed period (figure no. 4). House-hold clients are divided into five categories, according to the same EU Regulation no. 2016/1952: DA – less than 1000 kWh, DB – between 1000 and 2500 kWh, DC – between 2500 and 5000 kWh, DD – between 5000 and 15000 kWh and DE – more than 15000 kWh per year.

Figure no. 4. Monthly consumption of electricity by household clients on the competitive market between 2019-2021

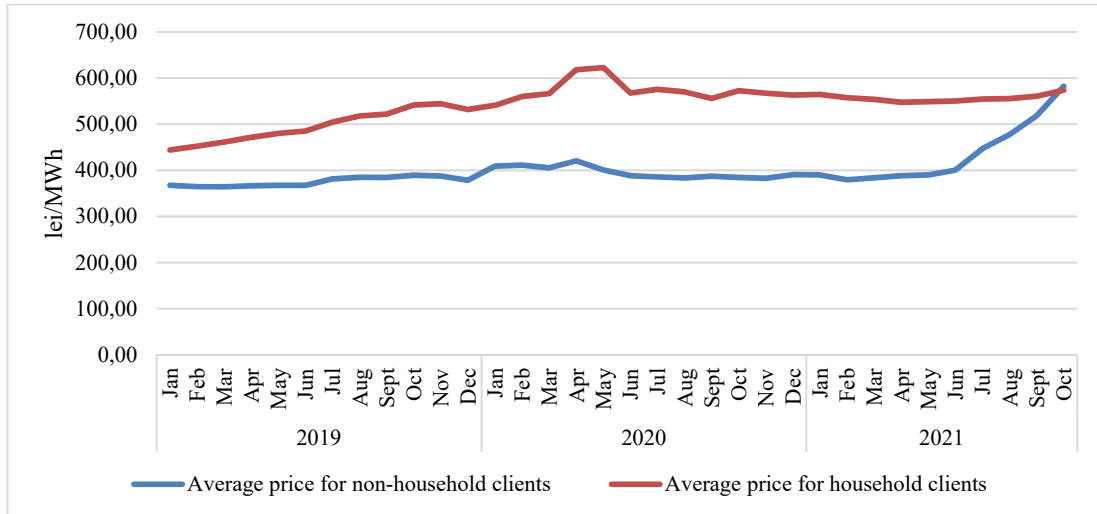


Source: Monthly reports of the Romanian Energy Regulatory Authority 2019-2021

Consumption of household clients on the competitive market increased in the analyzed period, based on two factors: the increasing number of clients that switched from the universal service regime to the competitive market, and the increasing number of persons working from home during the pandemic.

Regarding the evolution of the average price for non-household and household clients on the competitive market between 2019 and 2021, we can note the existence of an upward trend, as showed in figure no. 5.

Figure no. 5. Average price of electricity for non-household and household clients on the competitive market between 2019-2021



Source: Monthly reports of the Romanian Energy Regulatory Authority 2019-2021

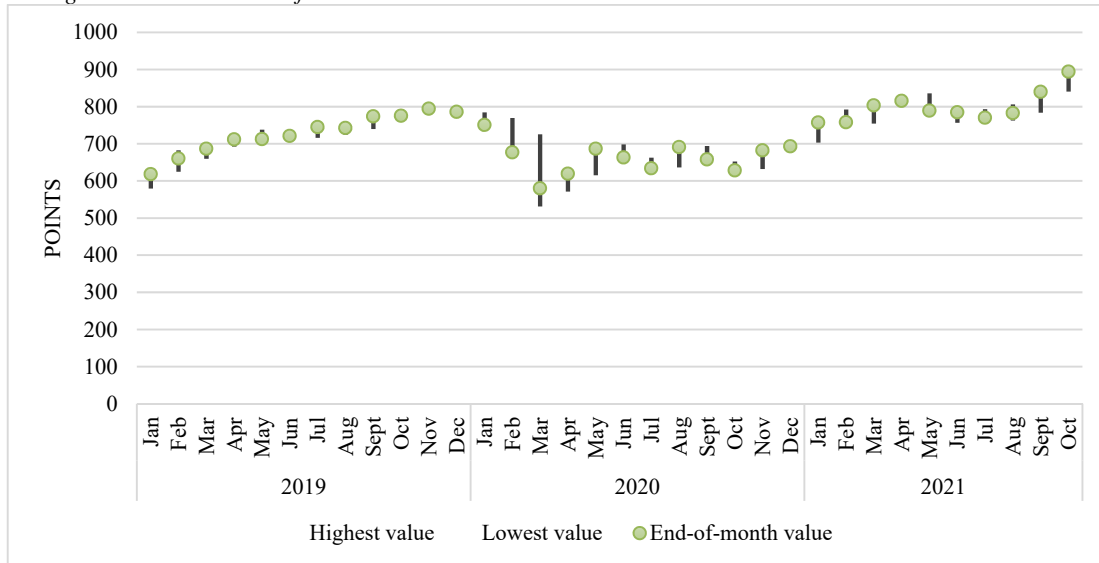
The selling price for household clients has been significantly higher than that of non-household clients during the analyzed period. For non-household clients, the price ranged between an average of 364.29 lei/MWh, in March 2019, and an average of 582.24 lei/MWh in October 2021, when, for the first time, it was higher than the price for household clients. A significant increase in the price for non-household clients appeared starting from June 2021, when the growth rate accelerated, compared to the previous periods. For household clients, the price of electricity on the competitive market increased from an average of 444.20 lei/MWh in January 2019 to a maximum of 622.80 lei/MWh in May 2020, then fluctuated around 560 lei/MWh until October 2021. In October 2021, the average selling price of electricity for household clients on the competitive market was 573.81 lei/MWh.

To conclude our quantitative analysis of the retail competitive electricity market in Romania, we can remark that at the time of the study we have differences between the non-household segment and the household one. The non-household part of the competitive market is a competitive one, with many active suppliers. As expected, the consumption of electricity by non-household is bigger than that of households while the selling price is lower. Competition on the household segment is smaller, with fewer suppliers and higher concentration, but we can note a decrease of the HHI to levels indicating moderate concentration at the end of the period. Market liberalization plays an important part in this trend, as consumers are now allowed to change their suppliers at any time. In terms of consumption and price, the household segment of the competitive electricity market registered an increase both in consumption and in price during the analyzed period.

We will now focus our attention to the performances of the companies from the energy and utilities sector listed on the Main Market of the Bucharest Stock Exchange, and for that we will use the BET-NG index. BET-NG reflects the evolution of the companies from the energy and related utilities sector, listed on the main market of the Bucharest Stock Exchange. It was launched on July 1st, 2008, and it is composed of a variable number of companies, ten at present.

Figure no. 6 presents the evolution of BET-NG between January 2019 and October 2021. For each month, we consider the lowest, highest, and end-of-month value.

Figure no. 6. Evolution of BET-NG between 2019-2021



Source: Monthly reports of the Bucharest Stock Exchange 2019-2021

At the beginning of the analyzed period, in January 2019, BET-NG fluctuated between 579.37 points and 631.15 points and had an upward trend until the end of 2019. The uncertainties related to the COVID-19 pandemic influenced the evolution of the index in 2020, March 2020 representing the month with the biggest difference between the lowest and the highest value of the index (from 531.25 points to 725.78 points). The year 2020 was characterized by a sinuous evolution of BET-NG. In the first six months of 2021, the index increased its value, then declined in the summer months and increased again in September and October. At the end of October 2021, BET-NG had a value of 894.36 points.

The second part of our study tested the correlation between the evolution of the electricity market and the performances of the energy and utilities companies listed on the Bucharest Stock Exchange. The results of the Pearson's test for each hypothesis are presented bellow.

In case of H1 the result of the test indicates a positive correlation between BET-NG and NHCC, which was statistically significant ($r=.348$, $n=34$, $p<0.05$).

The test result for H2 shows a strong positive correlation between the two considered variables, that was also statistically significant ($r=.614$, $n=34$, $p<0.01$).

For the third hypothesis (H3), the result ($r=.500$, $n=34$, $p<0.01$) is statistically significant and suggest also a strong positive correlation between BET-NG and APNHC.

In case of the fourth hypothesis (H4) the result ($r=.048$, $n=34$, $p>0.05$) reveals that there is no statistically significant correlation between BET-NG and APHC. In this case, the hypothesis is rejected, and the null hypothesis is confirmed.

5. Conclusions

The competitive segment of the retail electricity market in Romania is increasing in size, both for non-household and household clients, due to regulations that allow clients to find the supplier that meet their price expectations. On the other hand, the price of electricity is at a record high level, following the international trend. After considering the evolution of the electricity market in the last two years and that of the performances of energy and utilities companies on the Romanian capital market, we can conclude that there is a statistically significant and positive correlation between electricity consumption and the evolution of the sectoral index for energy companies listed at the Bucharest Stock Exchange. In other words, stock market performance of energy and utilities

companies is influenced by the electricity consumption of both non-household and household final clients. The study also revealed a strong positive correlation between the price of electricity for non-household clients and the evolution of BET-NG, but no correlation between the price of electricity for household clients and the energy index. We believe that a reason behind this statistical result is that the companies comprised in the calculation of BET-NG have stronger connection to the non-household segment of the market, their financial performances being influenced more by the consumption and price of electricity for non-households. Also, there is a significant weight difference between consumption by non-household clients and household clients, therefore, profits from selling electricity to non-households are more significant.

Our study partially confirms the existing findings that the stock market is influenced more by oil and gas prices than by electricity prices, but we must note that the focus of our research was set on the energy and utilities companies and not on the entire stock market.

Finally, we consider that the short-term analysis that we conducted can represent a limitation for the study, as well as the use of average monthly data for the variables. Our future research will try to solve these limitations.

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