

OIL SHOCK IMPACT UPON ENERGY COMPANIES INVESTMENT PORTFOLIOS. TRENDS AND EVOLUTIONS IN THE ENERGY CONSUMPTION SECTOR

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Abstract. In this article, we tackle the complex relationship between a triangle assessment: energy companies, investment portfolios, and the energy consumption sector. The first objective of this paper was to underline several important features of oil price evolution in the pandemic period, with a special focus both on the 2020 and 2022 periods, in order to reveal some aspects of new passengers’ cars registered, and some important energy sources worldwide. Second, it is highlighted several important features of energy-listed companies on the Bucharest Stock Exchange and of oil prices upon different operators. Third, we analyze important aspects of the influence of the crises regarding the energy industry and several important evolutions upon the stock market. The main findings of this study reveal the nexus between oil shock prices, the energy industry, and the stock market with an empirical focus on constructing an optimal investment portfolio’ by considering several consumption sectors. Future research on this topic will encounter consequently comparisons between several business models of different types of sectors.

Keywords: oil price; investment portfolios; energy companies; consumption sector; stock market.

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JEL Classification: F64, G14, G41.

1. Introduction

The recent economic crisis, which is shaping up as a result of the pandemic created by the SARS-CoV-2 virus, has revealed some older, but also newer, problems regarding the planet's energy sources and consumption.

If human pollution was not obvious during drastic travel restrictions, even the skeptics were convinced that the waters do not necessarily have a brown color and that rivers, lakes, and coastal areas can have clean water.

The purpose of this study is to present, *mutadis mutandis*, some important characteristics regarding energy consumption sources, different types of consumption, and oil shock price movements. Moreover, this paper it is highlighted the important structure of a portfolio choice, having a special focus on the energy sector. The main objective of this paper was to encounter some specific trends and evolutions registered by the stock market, both on a Romanian and worldwide level, regarding the antecedents and consequences of oil price movements upon energy-listed companies.

The structure of this paper is as follows: Section 1 represents a quid pro quo regarding a critical analysis of the current state of the art, with a special focus on the significant results of the empirical studies regarding the main important aspects in the economic literature. Section 2 analyzes and assesses some important features regarding some fine-tuning characteristics of oil price movements during the pandemic period, as well as precious aspects for the acquisition of electric cars, and also a historical trend towards energy sources worldwide with a special focus oriented towards fossil fuel. Section 3 encounters the main core findings of the study revealing some important features such as the evolution of energy listed companies at the Bucharest Stock Exchange, the impact upon several different operators of oil price movements, the energy industry status quo in times of crises, and market evolutions in difficult agenda paths. Section 4 presents the main findings and conclusions of this study with a special focus oriented towards different types of patterns which must apply to several business models.

2. Literature Review

The problem of portfolios regarding the forecasts of short-term electricity was analyzed in terms of ARIMA models with stochastic programming and revealed some interesting insights regarding the 24h ahead electricity market (Sanchez et al. 2016). Vandyck et al. (2018) identify the fragility of oil-exporting countries tackling the impact of macroeconomic responses to the limitation of global warming. Optimal

power system portfolios are used in order to give a direction for policymakers regarding the establishment of a tradeoff between economic and environmental issues (Mari 2018). Other authors emphasize that by using the GARCH methodology for a diversified portfolio allocation, it is needed a bidirectional volatility transmission mechanism (Perifanis & Dagoumas 2018).

Cevik et al. (2018) developed a study for G7 countries in which it used several Granger causality tests' for establishing the effects after the financial global crises. The authors have come to the conclusion that the volatility of the stock markets can have a significant impact on stock returns and oil price movements. Moreover, by using fuzzy theory, the decision-making process can be improved by the usage of membership functions and investors' aspiration levels (Glensk & Madlener 2018). The oil shock fluctuations are, mutadis mutandis, associated with the agricultural market for the explanation of the fluctuation of different prices (Hong et al. 2019). Son et al. (2019) propose a mathematical model with the usage of a 2x2 matrix in order to reveal each type of Korean government power policy sustainability and implications (Son et al. 2019).

The renewable portfolio standard implemented by China is highlighted by an evolutionary game model in order to establish the proper manner of supplementary policy (Don et al. 2019). The modeling of a gross energy-only pool can have conclusive outcomes upon forward and spot contract markets (Simshauser 2019). Ahmed & Shimada (2019) developed a panel co-integration test for establishing the correlation between economic growth and energy consumption and concluded that the results differ regarding the different types of country developments. Other authors reveal some important co-integration tests between the Crude Oil Volatility Index and oil price and concluded that a significant role has the nexus between fear gauge and oil price (Lin & Tsai 2019).

Krisskumar & Naseem (2019) analyze the model with augmented autoregressive distributed lag and conclude that for Brunei the oil price effect is asymmetric, and for the case of Malaysia and Vietnam, it is insignificant. The FUND energy model impact suggests that global warming can be a factor that reduces global energy consumption (Lang & Gregory 2019). Martinez-Fernandez et al. (2019) use Modern Portfolio Theory in order to optimize several generation technology portfolios. The authors reveal that using Capital Asset Pricing Model can be reduced the costs and risks of the portfolios by the usage of adequate renewable energy techniques and tactics (Martinez – Fernandez et al. 2019).

The empirical results enriched in Table 1 are focused upon the analysis and evaluation process regarding the soundness of the main important studies in the empirical literature.

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Table 1 Previous empirical studies regarding Oil price shocks, the energy consumption sector and their impact on the stock market

Authors	Method	Countries	Time period	Results
De la Nieta, Gonzalez & Contreras (2016)	ARIMA models for the construction of portfolio using stochastic programming	Spain	2014 – 2016	The input data of the prices is correctly flowing by the trend of prices
Mari (2018)	Stochastic dynamic model using geometric Brownian motions	The U.S.	1950 – 2010 & 1950 – 2011	The carbon tax scheme will generate effects on the problems of portfolio selection within the power system
Perifanis & Dagoumas (2018)	Generalized Autoregressive Conditional Heteroscedasticity (GARCH), Dynamic Conditional Covariance (DCC) and Momentum Threshold Autoregressive (MTA)	U.S. market	1990 – 2017	At the aggregate level, both commodities influence the volatility of each other's
Cevik et al. (2018)	Granger causality tests	G7 countries and 23 emerging market countries	1988 – 2018	The volatility of stock markets influences the impact of oil price movements on stock returns
Hong Vo et al. (2019)	Structural Vector Autoregressive Model (SVAR)	World Bank Commodity Price Data	2000 – 2018	The agricultural price fluctuations are not always influenced by every oil shock
Son et al. (2019)	Mixt – integer linear programming	Power generated industry of Korea	2016 – 2029	2 x 2 matrix for assessing each type of power producer upon

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				several factor changes
Dong et al. (2019)	Evolutionary game model	China	2014 – 2018	The policy type of incremental electricity price is based on grid companies of an initial strategy
Simshauser (2019)	Energy Gross Pool Model – NEMESYS	Australia	2016	The market efficiency can be impaired by CfDs' in an energy-only market
Ahmed & Shimada (2019)	Perasan cross-section dependence (CD) test; Cross-sectional augmented IPS test (CIPS); Panel co-integration test; fully modified ordinary least square (FMOLS) & dynamic ordinary least square (DOLS)	30 emerging and developing countries	1994 – 2014	The study proposed multiple possible policy options regarding renewable energy investments
Kriskkumar & Naseem (2019)	Autoregressive distributed lag model (ARDL) Non-linear Autoregressive distributed lag model (NARDL)	Brunei, Malaysia, Vietnam	1979 – 2017	The oil price effect is asymmetric in Brunei and insignificant in Malaysia and Vietnam
Lang & Gregory (2019)	FUND model energy impact functions	World regions	2009 – 2012	As the temperature increase, energy expenditure decreases
Kim et al. (2019)	Markov regime-switching model (MRSM)	Korea, The U.S.	1991 – 2019	Unstable regime – high volatility; stable regime –

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				low volatility
Torre-Torres et al. (2019)	Markov-switching GARCH Models (MSGARCH)	The U.S.	1994 – 2019	Improving oil market performance by using the time-fixed variance of the MS Gaussian model
Janczura & Michalak (2020)	Selling strategy of an electricity producer optimization scheme	Poland	2016 – 2018	Higher risk is associated with higher profit
Haugom et al. (2020)	Ordinary least squares and quantile regressions	Nord Pool	2005 – 2014	An increase in market efficiency is associated with decreasing forward premium and a mature market
Hoque et al. (2020)	Fama-MacBeth two-stage panel regression	Malaysia	2013 – 2017	Investors receive higher returns depending on a momentum-driven strategy
Liu & Hamori (2020)	Constant and time-varying copula models	U.S., Austria, Denmark Spain & Switzerland	2007 – 2019	ESG index and generates a high return and lowers the potential of CVaR
Taddeo et al. (2020)	Multi-level optimization algorithm	Spain	1991 – 2007	The energy injected is accomplished meanwhile energy consumption shifts to daytime hours

Source: Authors' own processing based on the empirical studies analyzed in mentioned sources.

Yang et al. (2019) determine the correlation between stock markets and crude oil using a panel data analysis and conclude that the credit risk and economic activity have a negative effect while risk-free rate encounters' a positive effect. Between exchange rate movements and oil shock prices using a Markov switching model, there can be identified a high volatility unstable regime and a low volatility stable regime regarding the Korean case study (Kim et al. 2019). Other authors are using different Markov switching models and reveal that with the Gaussian model there can be registered the best results in the oil market (De la Torre – Torres et al. 2020). The selling strategy regarding an electricity producer using an optimization scheme led to the conclusion that there is a direct correlation between the risk increasing degree and associated profit (Janczura & Michalak 2020). The establishment of energy safety with the smart home system by using Weka API and J48 machine learning algorithm reveal a reduced energy consumption and a high comfort home (Machorro – Cano et al. 2020). The quantile regression and ordinary least square methods are successfully used in determining the Nord Pool electricity market in order to determine the volatility effects on the stock market (Haugom et al. 2020). Sifakis et al. (2020) determine the renewable energy sources by using behavioral analysis. The authors conclude that by applying several intervention measures of energy efficiency, there can be identified a reduced environmental footprint. The panel regression approach with a two-stage Fama-MacBeth model offers strong investment strategies regarding portfolio management and asset prices (Hoque et al. 2020). Liu & Hamori (2020) demonstrate that by using the ESG index the investor needs to diversify their portfolio funds in the energy sector in order to assess also several environmental issues. The multi-level optimization algorithm is successfully used in order to determine the way the energy is consumed or produced by the residential districts (Taddeo et al. 2020). Other authors tend to construct an energy potential mapping in order to create sustainable energies (Fremouw et al. 2020). The usage of several dairy energy prediction models is successfully applied, in order to establish the impact of managerial practices and changes to infrastructural equipment (Meadows et al. 1972).

Jimon et al. (2021) highlight the importance of the construction of optimal portfolios regarding personal investments in the stock market and come to the conclusion that the sine qua non condition regarding the rational use of financial products by the population is the financial knowledge of the people. The impact of financial crime on the management of companies was analyzed by Novackova et al. (2020) in terms of strengthening the legal and economic conditions for the companies' development and evolution. Balukja (2018) highlights the importance of the corporate finance process in the objective of shareholder gains and company profits.

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Finally, Dumiter & Turcaş (2022) suggest that the optimal way in order to construct an optimal portfolio is by taking into account the practical correlations and adapting the probabilities to the different paths of a special event.

3. Methodology and data

Since 2020, world peace has been disturbed by a series of events unprecedented in the last decades:

- First was the Coronavirus CoViD-19 pandemic. It has put the world at a standstill, in a total lockdown, unprecedented in recent history. Panic set in on the stock exchanges, and the price of oil naturally fell with the shutdown of tourism, transport and processors. On 2020-04-16, Crude Oil WTI Futures (CFD) hit an all-time low of -40.19 \$ a barrel (investing.com).
- The market recovered in a V shape form, as quickly as it collapsed. Most of the restrictions related to the pandemic have been preserved: tourism has not fully recovered, working from home has become generalized for bureaucracy, some schools remained in the online teaching format.
- New alarm bells have emerged, some without a logical, plausible economic explanation: the semiconductor crisis, the container crisis. Basically, commodities were at historic lows and signals were emerging that something was being prepared.
- Then, after months of accumulating troops in the area, Russia enters Ukraine with its army. Drastic economic sanctions are emerging, with the blocking of Russian funds and goods. Energy is rising at unprecedented prices; Europe is realizing that it cannot secure its industry in the absence of Russian gas; oil is rising sharply.
- At the time of writing the article, the Russian blitzkrieg was wrong, and the belligerents can reach an agreement to end hostilities.

Very interesting is the tracking of these events in the stock markets. First, let's note that hydrocarbons are not at historic highs, whereas the stock market is. Oil has also had spikes, some even higher than the current one, others of longer duration. Natural gas has also had periods in which it has had quotations well above the current ones. It's probably a subjective feature, but always the events you're going through now seem more important than anything else that's happened in the past. On a global scale, however, the current oil crisis is not the most acute and solutions already seem to be found to break the deadlock – for example, increasing oil supplies from Saudi Arabia, to deliver liquefied gas at sea.

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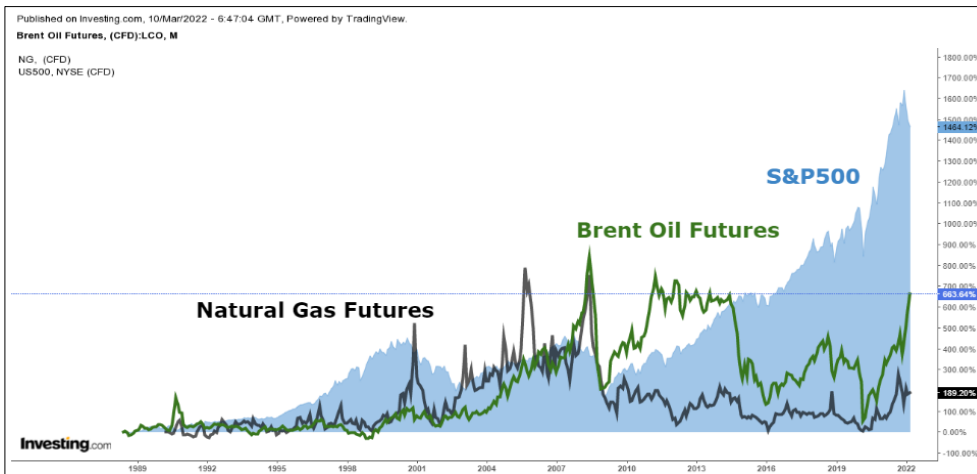


Figure 1 Oil and Gas price evolutions, compared with S&P500 index

Source: Own processing based on the data available at investing.com.

The next observation concerns the increase in the prices of commodities, in line with the increase in general energy prices. We note that raw materials are not at historic highs either and the declines during the pandemic have almost imposed a return of prices to sustainable levels for processors.

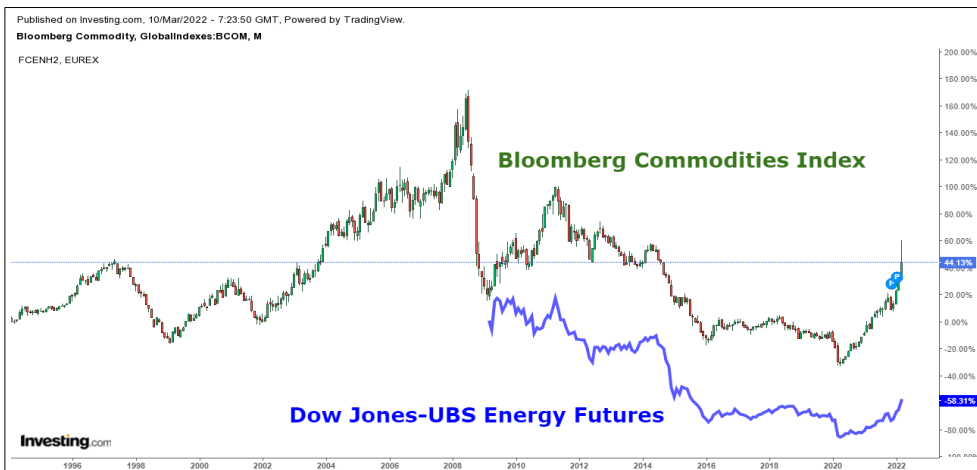


Figure 2 Energy and commodities prices evolution.

Source: Own processing based on the data available at investing.com.

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The reaction of the financial markets in this macroeconomic context follows in the study.



Figure 3 Stock market (S&P500) reactions to worldwide exceptional situations

Source: Own processing based on the data available at investing.com.

The stock markets recovered first after the unpleasant surprise induced by the pandemic and rose at the same pace at which they initially fell. Then everything seemed to be going well, until Russia attacked, with important military forces, Ukraine. European markets reacted more strongly, but American ones were also influenced by panic. We hope that the end of the military conflict will be near; however, the economic repercussions are still far from being assessable. The blocking of funds, the entry of Russia practically into default, the leave of the country by large industrial and service processors (followed by the threats of nationalization of their goods), a new crisis of strategic raw materials exploited by Russia, all this will reverberate for a long time in the macroeconomic environment.

In Romania, many commented that the price of oil was still at such high levels before, however, gasoline at the pump was much cheaper. First, let's note that the price of gasoline varies strongly from country to country.

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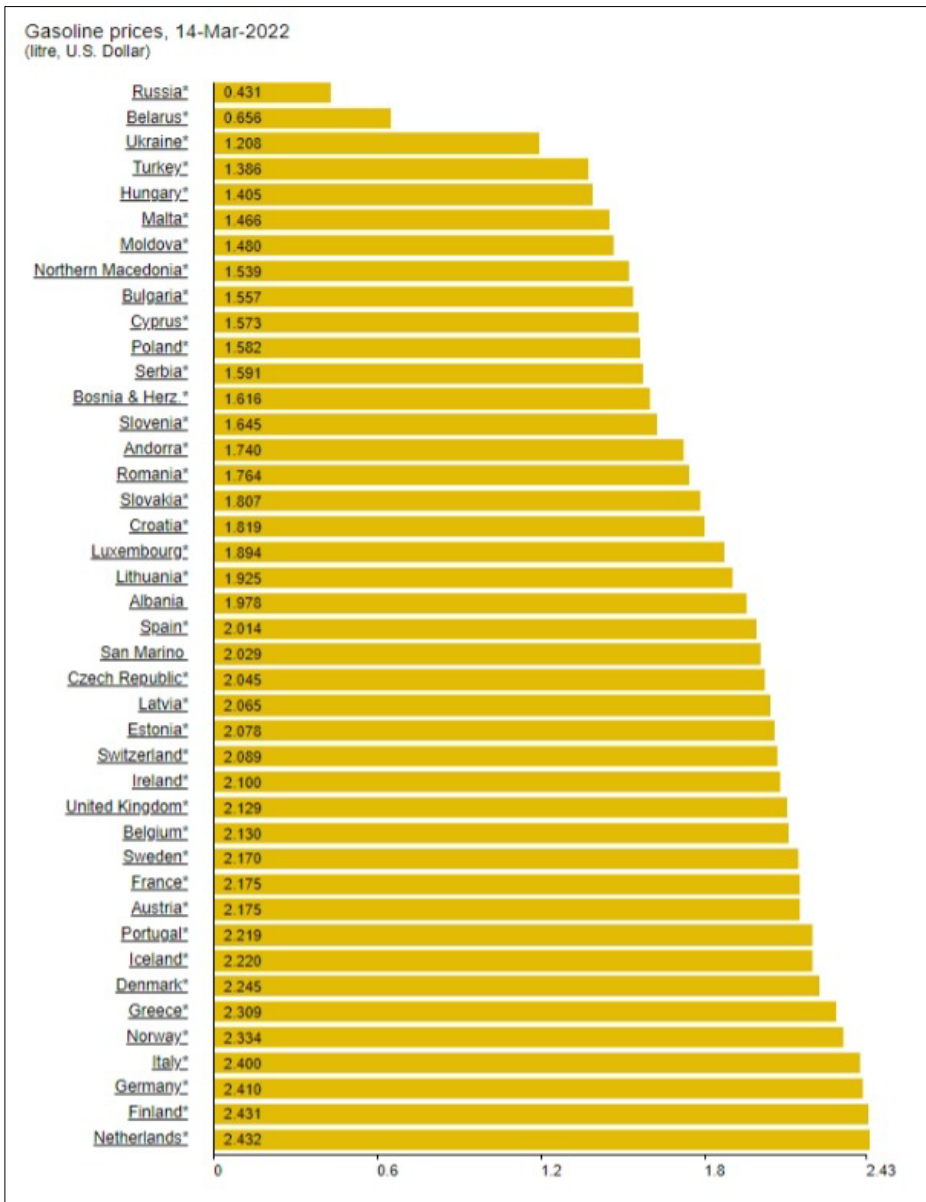


Figure 4 Gasoline prices across Europe

Source: Own processing based on the data available at www.globalpetrolprices.com/gasoline_prices/Europe/

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Secondly, we note that the reality is that the price of gasoline varies directly correlated with that of crude oil, as is normal. It is, in our opinion, a typical case of the Mandela effect: because for a long time the price of fuel has been reasonable, people forget that even in the recent past there have been major price changes at the pump. It is true that the price of gasoline has recently reached record values in Romania, but major increases, due to the increase in the price of crude oil, have occurred before, even recently. And the war in Ukraine and the recent energy crisis explain why the resistance threshold of gasoline has been exceeded.

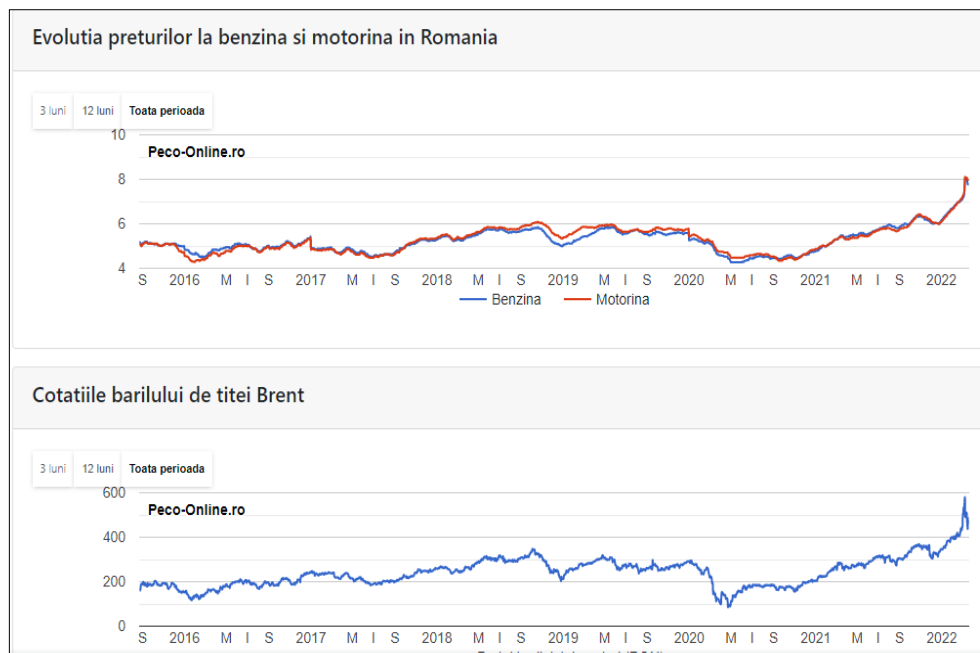


Figure 5 Gasoline vs. Oil prices in Romania

Source: Own processing based on the data available at www.peco-online.ro/istoric.php

Finally, the price of gasoline at the pump in Romania is formed by adding an excise duty of 1.89 lei/liter and VAT of 19%, so that the state earns more than processors.

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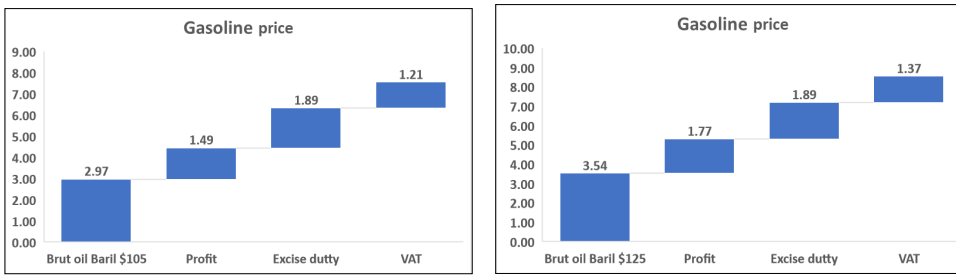


Figure 6 Gasoline price formation

Source: Own Excel compilation of data from <https://playtech.ro/2022/>

The authors also noted that the effect of reducing fuel demand had undesirable effects. Layoffs and stock market declines have drawn attention to the fact that the change in energy sources must be made gradually. At this point, it is proposed an imagination exercise, consisting of a series of hypothetical questions. What would happen with the colossal installations in the oil derivatives industry? What course of action would be appropriate to take, with the resulted high unemployment rate in the oil-companies sector? How much would investors (including pension funds) lose from stock market declines?

Electric cars are being promoted (aceea.be), but the image of an electric charger powered by a diesel generator has gone viral. The electric vehicles solution is obviously one for the future, but now electricity is generated mainly by burning fossil fuels.

In Figure 7 it can be seen that industrialized countries in which the automotive industry is a very important one, promote electric cars to the detriment of those with conventional fuels. This tendency might lead to a stronger decrease vis – á – vis of the world demand for crude oil.

Following the Fukushima accident, it was proposed to abandon the nuclear power plants. A risky, impulsive proposal, but unfortunately, coming from high-ranking officials who had knowledge in the field. Increasing security and waste management are natural and necessary steps. But the impressive yield and virtually non-existent direct pollution (harmful emissions) are strong arguments for the development and not for the restriction of this form of energy.

Russia's attack on Ukraine and European dependence on Russian energy sources have reopened burning topics:

- France plans to build 14 new nuclear reactors.
- It is intended to postpone the closure of coal-fired power plants.
- Solutions are being sought to reduce Russian gas imports.

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The volume and weight evolution of energy sources that are worldwide used is presented and analyzed in Figure 8.

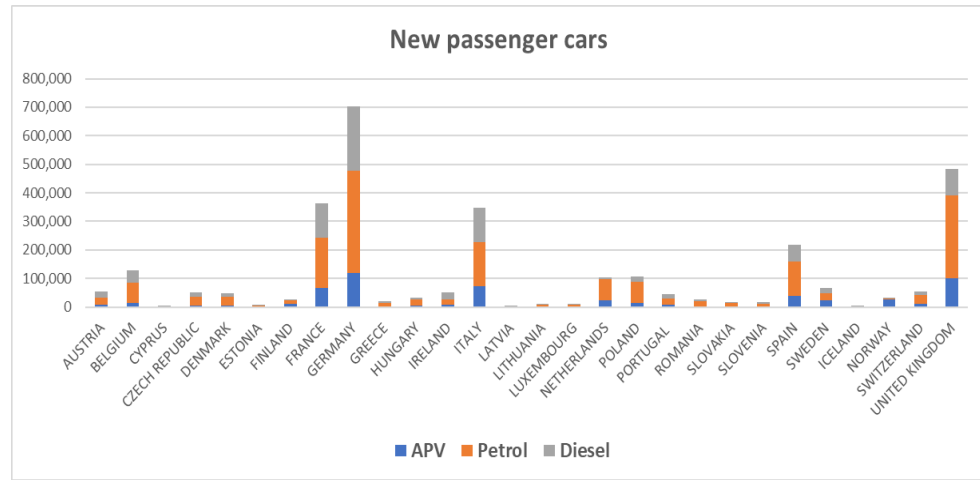


Figure 7 New passenger cars registered in Q1-2020

Source: Own processing data from www.acea.auto

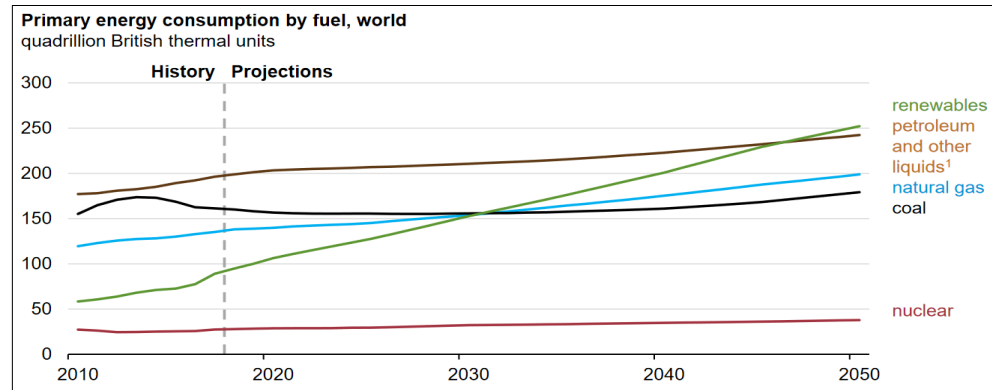


Figure 8 Tendency for renewable energy sources

Source: www.eia.gov

Based upon quarterly and yearly reports, the data in Table 2. The efficiency of Nuclear Power Plants demonstrates the economic efficiency of electricity production in nuclear reactors from Cernavodă Romania, by Societatea Națională Nuclearelectrica SA, listed on the Bucharest Stock Exchange under the SNN ticker.

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Table 2 The efficiency of Nuclear Power Plants

Millions lei	Restated: 2016	Restated: 2017	Original: 2018	Restated: 2019	Original: 2020	Estimate: 2021	Estimate: 2022
For the period ending	2016-12-31	2017-12-31	2018-12-31	2019-12-31	2020-12-31	2021-12-31	2022-12-31
Revenue	1,648	1,897	2,129	2,378	2,446	3,398	4,106
Operating Expenses	1,526	1,546	1,643	1,760	1,720		
Operating Income (Loss)	155	387	536	657	780	1,060	2,085
Net Income, GAAP	112	307	411	536	699	1,188	2,213

Source: Bloomberg terminal.

At the end of the last century, the respectable Club of Rome pointed out that the reserves of raw materials of mankind could be depleted in a few decades (Meadows et al. 1972). Fortunately, their forecasts have not been met, however, the limitation of energy resources is an issue that should not be taken lightly, nor should their concerns be dismissed.

4. Empirical results

4.1. Energy Companies Listed on the Romanian Stock Exchange

The Romanian stock market is concentrated on the Bucharest Stock Exchange. 84 companies are listed on the regulated market, with a total market capitalization of 28.7 billion euros. The energy sector and related utilities are represented by issuers grouped in the BET-NG sector index, built by weight in the market capitalization, adjusted with free-float, the representation, and price correction factor. (bvb.ro).

The main energy companies in Romania have as objects of activity the extraction and processing of crude oil (SNP), natural gas production (SNG), electricity production (SNN), respectively gas transmission (TGN), and electricity transmission (EL, TEL).

The Romanian energy companies' weight in the BET-NG index is presented and analyzed in Table 3.

Table 3 The Main Energy Companies Listed on the Bucharest Stock Exchange

Company	Ticker	Weight
OMV Petrom	SNP	29.62%
Romgaz	SNG	29.84%
Transgaz	TGN	8.12%
Electrica	EL	8.10%
Nuclearelectrica	SNN	17.10%
Transelectrica	TEL	3.73%

Source: BVB

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4.2. The Influence of Oil Prices on Operators

The Romanian company SNP (OMV Petrom SA) is the most important crude oil operator in the country, being involved in the entire fuel processing and distribution chain. Therefore, it is natural that there is a direct link between its stock price and the price of the raw material - crude oil.



Figure 9 SNP vs. Oil quotations

Source: Own processing based on the data available at www.investing.com

Similarly, the stock price of international companies directly involved in oil processing is directly influenced by the barrel price.

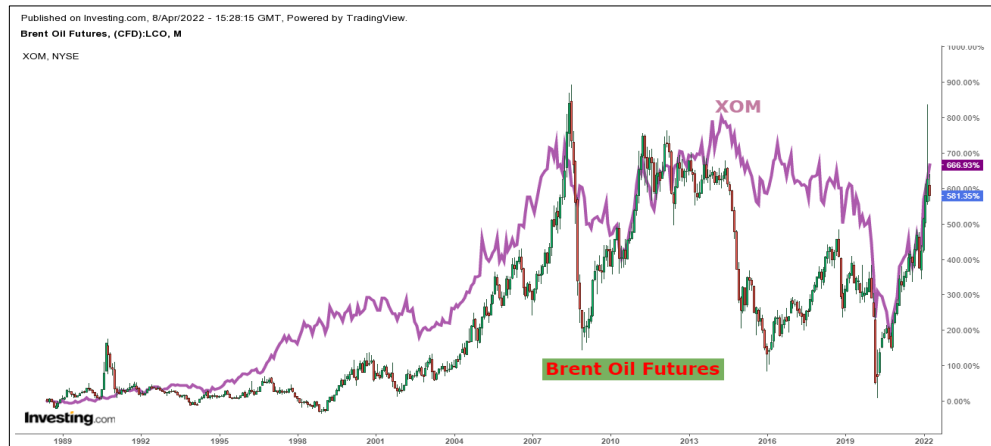


Figure 10 Brent Oil vs. XOM

Source: Own processing based on the data available on www.investing.com

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Globally, demand in 2020 is expected to decline by 8.1 Mb / d due to the CoViD-19 pandemic, and global oil supply to fall by 7.2 Mb / d (iea.org). Coupled with lower oil prices, the effects are, on the one hand, the reduction of profits and stock prices of operating companies, on the other hand, the reduction of industry and transport costs.



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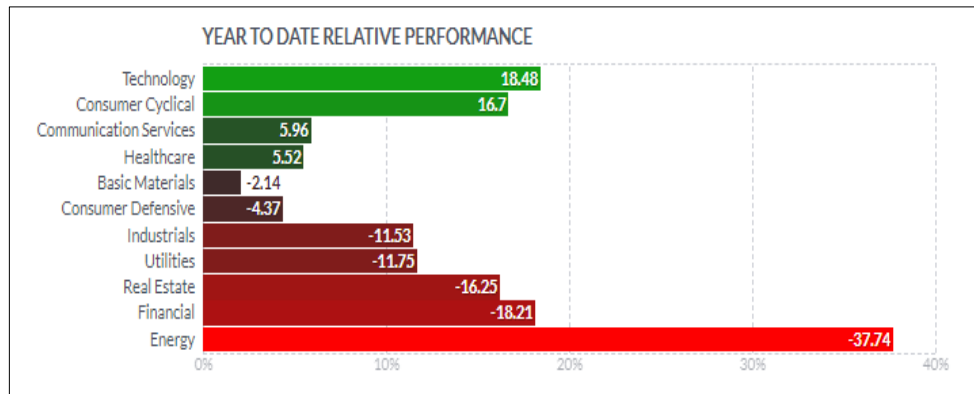
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Figure 11 Ytd performance S&P500 2020-07-15 vs. 2022-04-08

Source: Own processing based on the data available at print screen (finviz.com).

According to the data provided by (eia.gov), both consumption and supply of Petroleum and Other Liquids suffered significant decreases in 2020. The estimated recovery (starting from Q3-20) would imply the weakening of the pandemic and the resumption of free movement of people and goods, optimism, which is under question at the time of mid-July 2020.



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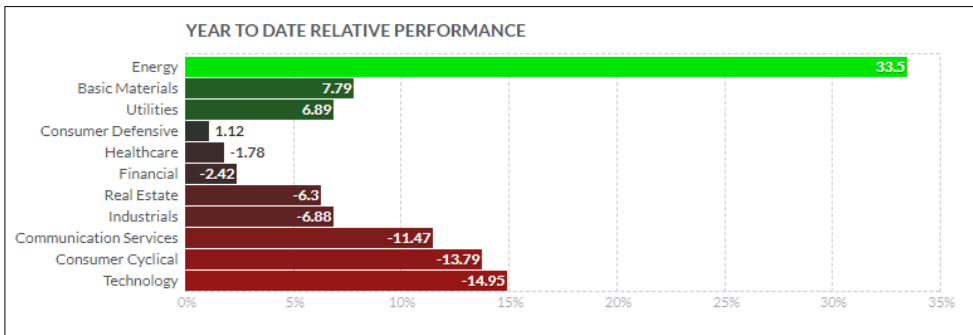


Figure 12 Year to date sectors performance. S&P500 2020-07-15 vs. 2022-04-08
 Source: Own processing based on the data available at print screen (finwiz.com).

The optimistic graph used in Figure 13 can reflect the specialist’s forecasts.

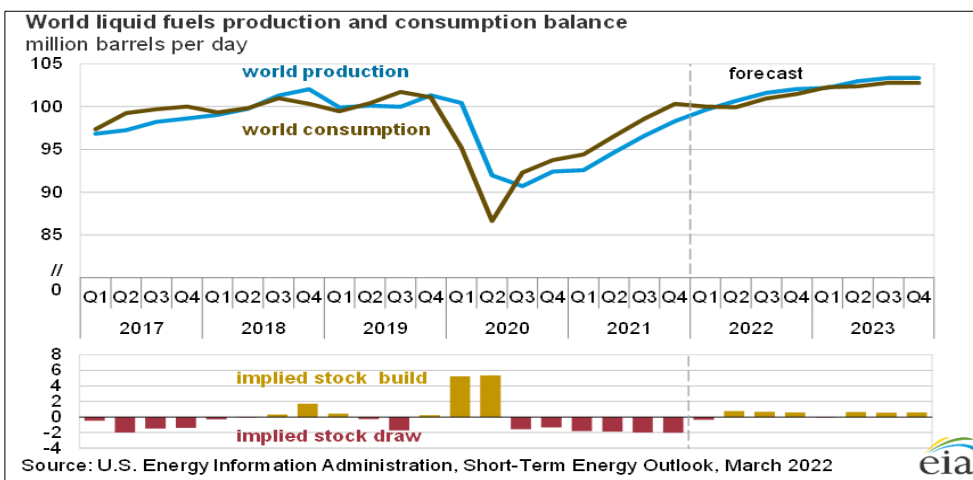


Figure 13 International Petroleum supply and consumption

Source: Own processing based on the data available at <https://www.eia.gov/outlooks/steo/>

4.4. Market evolutions

The modern markets are focused mainly upon the quotation of innovative companies with human and technological perspective levels is detrimental to the heavy industries. This tendency oriented towards flexibility emphasizes that several underlying companies discard a large number of real estate assets in return for their rental, increasing their mobility and folding possibilities.

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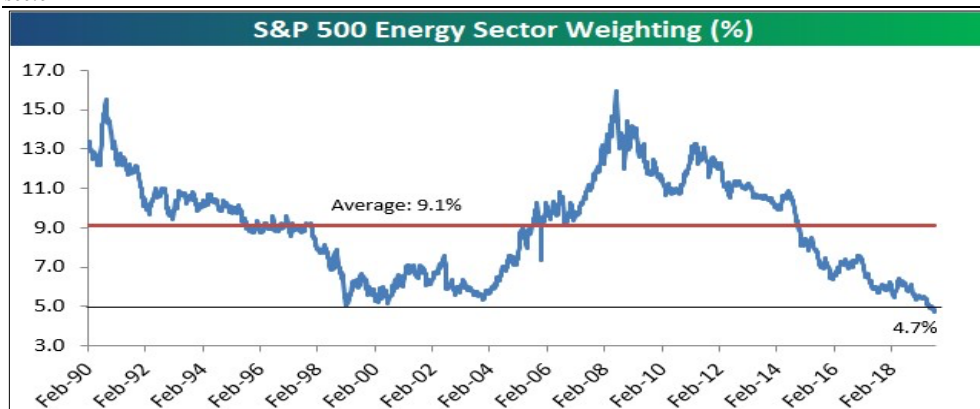


Figure 14 Energy sector weight

Source: Own processing based on the data available at <https://theotrade.com/energy-weight-in-sp-500-lowest-since-1990/>

This tendency has several implications for the energetic industry. The industrial giants cannot change their strategy and hardly the adaptation process to the technological shifts.

The transition from gasoline engines to electrical ones represents a difficult and long process, meanwhile, there are no practical solutions for the Diesel engines for big trucks. However, the large energy producers: hydropower, power plants, nuclear power plants, or large carriers (through cables or pipes) do not have any instrument for changing rapidly their technologies.

The difficult adjustment effect of traditional companies towards the technological shifts is reflected in the energetic sector weight in stock market investments. For example, there can be identified the S&P500 decreased weight in the energetic sector (Figure 14) consequently with the increase in the weight of Communication Services and IT sectors.

Table 4 The energetic companies' exposure is represented in the BET stock index

Issuer	BET
OMV Petrom	15.38
Banca Transilvania	19.57
SNG Romgaz	9.05
BRD - Groupe Société Générale	9.14
SNN Nuclearelectrica	5.19
TGN Transgaz	2.46

Source: Own processing based on the data available at BVB.

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Considering that S&P500 is weighted by the float-adjustment market capitalization index, it seems that the investors' interest is moving upon the dynamic, flexible sectors considered important in the near future. Moreover, several funds invest in portfolios that imitate the market index and have a circular effect of decreasing the investors' interest through the drop in the investment weight.

The stock quotation decreases and/or is a reduction in the weight of stock indices which generates no direct effect upon the issuer. However, the decreasing of investment interests cannot aggravate the IPO fundraising and can generate an amount of scarceness oriented upon modernization and maintenance investments.

4.5. Econometric implications

Attempts to forecast oil prices are not recent. Nichifor et al. (2016) tried to model the price of oil according to production and consumption capacities; unfortunately, the paper does not present predictions, the theory being thus difficult to test. Technical analysts would suggest that the price of commodities (including oil) varies inversely from the share price. Nor does this theory have a remarkable practical validity (see Figure 15).

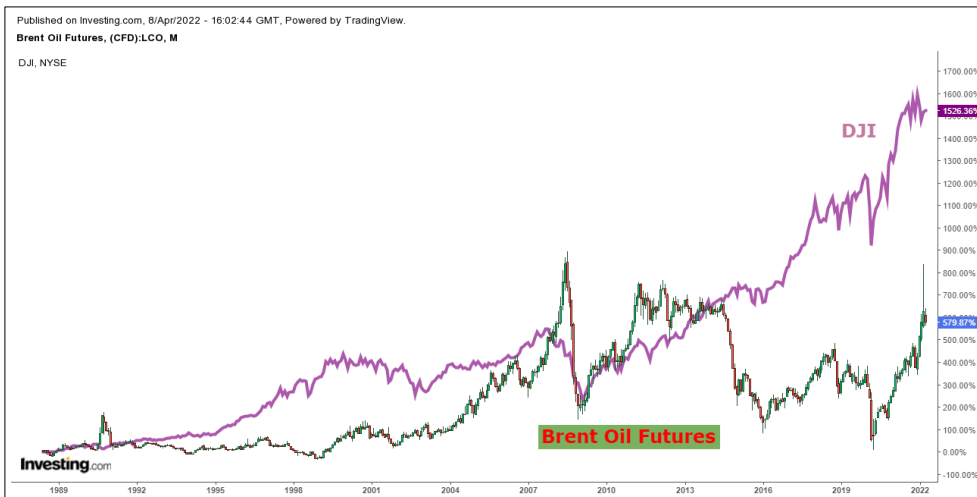


Figure 15 Oil vs. Stock exchange. No inverse relation

Source: Own processing based on the data available at investing.com

It is intuitive that the price of oil depends on global conflicts. Data on the price of crude oil and the number of conflicts and victims were downloaded from public websites and processed in Excel (see Figure 16), then transferred to Matlab

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modeling software. In Figures 17 and 18 it can be seen the testing of econometric hypotheses regarding the linear links between these variables were tested.

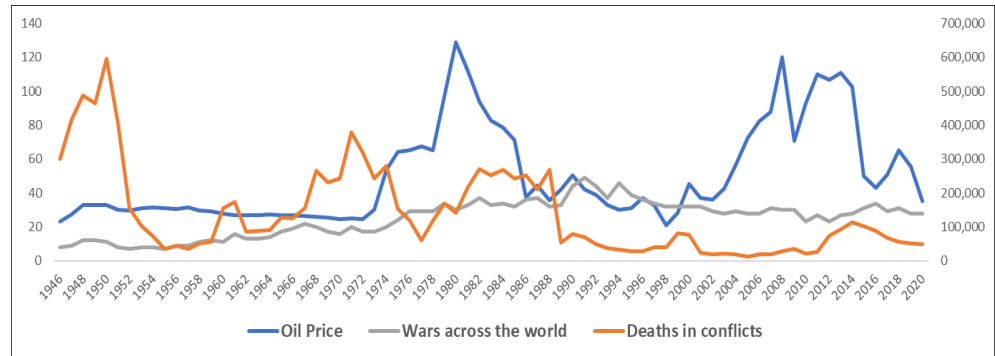


Figure 16 Econometric hypothesis

Source: Own processing.

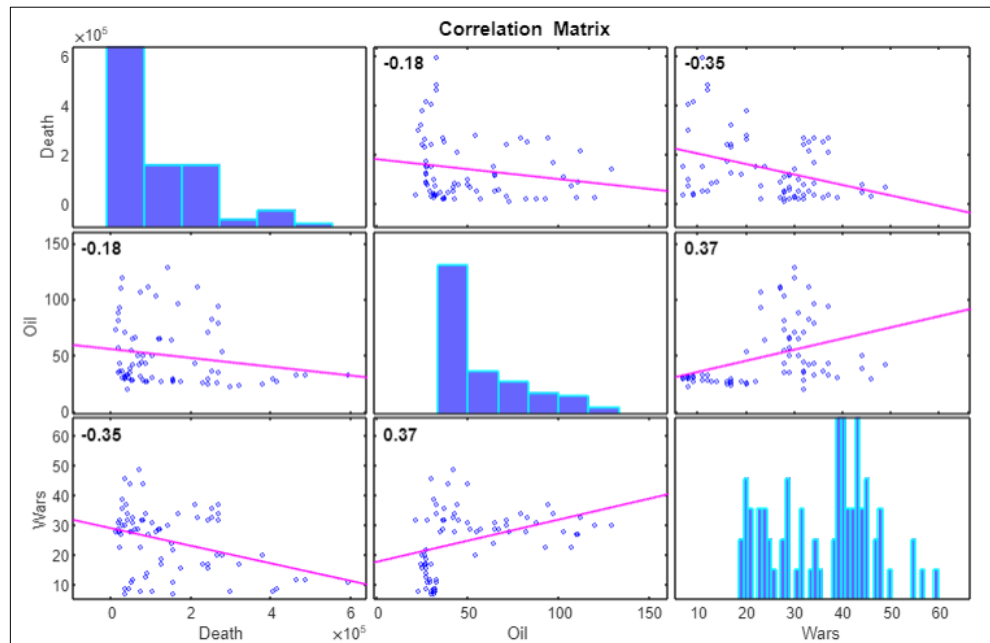


Figure 17 Correlation matrix

Source: Own processing based on Matlab econometric software.

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The results are inconclusive; instead, logarithmic differential series are somewhat better correlated:

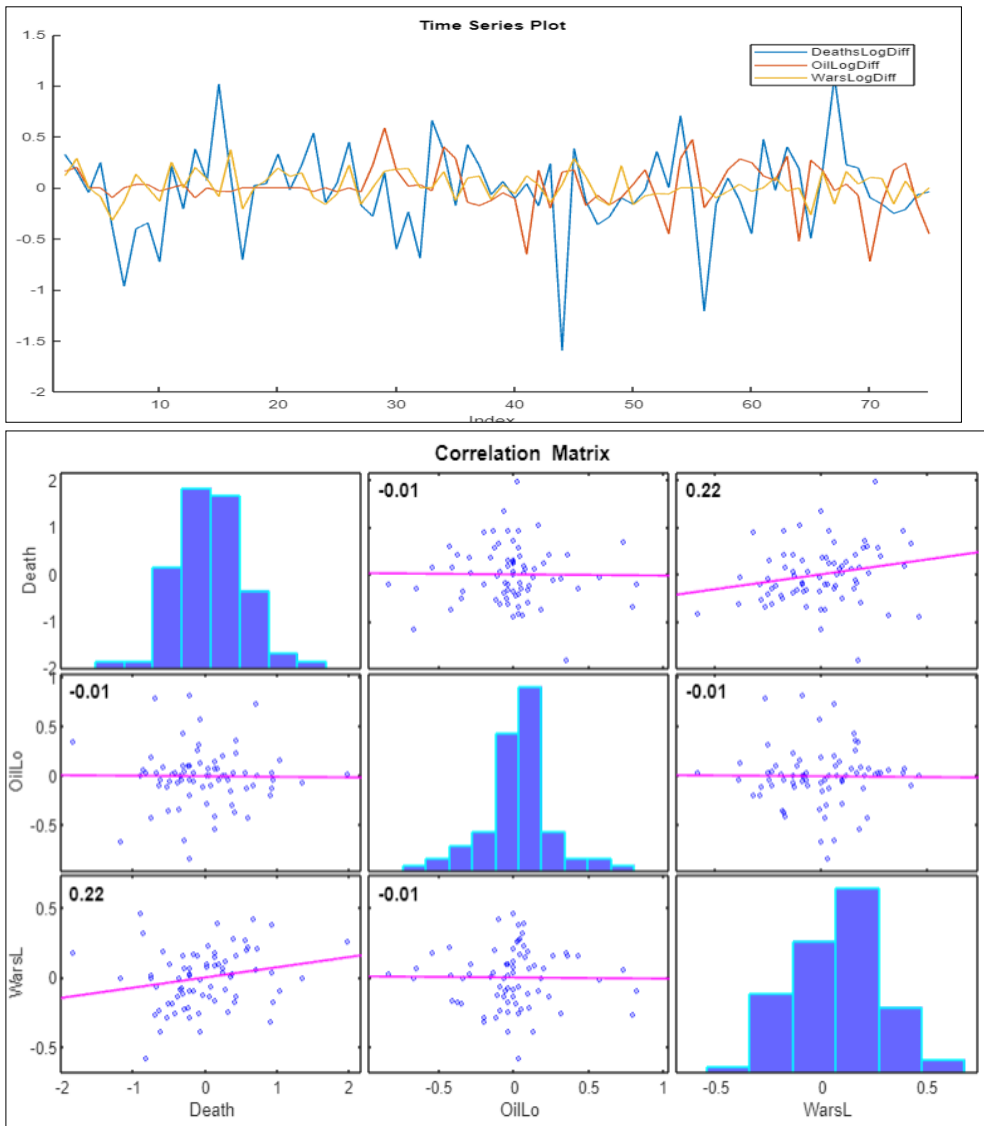


Figure 18 Correlation between logarithmic variations

Source: Own processing based on Matlab econometric software.

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5. Conclusions and discussion

As pointed out in the methodology and data section, although there is a strong positive correlation between gasoline and oil price, the end consumer will not pay an amount of money that is equally weighted in connection to the fluctuation of oil prices. To support the abovementioned claim, Figure 1 was processed by the authors (which clearly highlights the positive correlation between gasoline and oil price) and the reasons why the end consumer will still pay a higher price were included: taxes, duties, excises and included commissions and fees. The authors opine that the character of the aforementioned reasons is of a permanent nature, hence, it is highly unlikely if not impossible, for this correlation (end price paid by the consumers vs oil price) to improve. Future unknown and impossible to determine legislative changes could result in a change, but given the current state of affairs, the authors believe there is not much room for further discussion, (linked to the topic of this paper) in this direction. As a side note, a positive correlation exists between the cost of extraction and the end price paid by consumers, but due to the fact that is based on the working procedures and available technology of each company, it is hard to determine a generally applicable pattern. However, future research directions, such as comparing the business model of a statistically significant number of companies operating in the same field (which could also be debated, what is the appropriate number in order to be significant in this context), are more than welcomed and might have a chance to generate the desired outcome (lower end price) for the final consumer.

Next, it is argued that the decision to abandon nuclear power plants, due to the Fukushima accident, was rushed and impulsive. The arguments provided were the impressive yield and virtually non-existent harmful emissions. To provide evidence for this claim, it was given as an example a company listed on the Romanian stock exchange, namely Societatea Națională Nuclearelectrica SA, and calculated the production yield. Given the astonishing production yield, the average between 2017 and 2019 was 1.211%, the authors would like to re-emphasize the efficiency of power plants and the immediate need for a (political) optics change in this direction, or at the very least for the policymakers to have an unbiased attitude when comparing yields generated by nuclear power plants in comparison with alternative sources that generate energy.

The section that discusses the "Influence of Oil Prices on Operators" argued the fact that there is a strong correlation between the oil barrel price and the stock price of companies operating in the oil production and distribution, and that correlation is, of course, logical and natural, and was demonstrated by charts generated in Figure 9 and Figure 10. The authors chose for Figure 9 a Company listed on the Bucharest stock exchange, namely OMV Petrom, and an American company listed on the

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NYSE, Exxon Mobil Corp for Figure 10, in order to highlight the universal effect oil price fluctuation has, regardless of the country. Further implications (if the fall in the price of oil is a desire for all consumers because it involves a fall in the price of transport, the fall in stock market quotations of operating companies is largely undesirable, especially by investment and pension funds) were also mentioned and most certainly are worthy to be taken into consideration.

Finally, "The Influence of the Crisis on the Energy Industry" was approached. Through Figure 11 and Figure 12, which compare the Year-to-Date evolution of all eleven US Sectors from the S&P500, the authors clearly pointed out the different ways through which each sector was impacted by the crisis. While the Energy sector declined by more than 37%, the Technology sector was up more than 18%. The staggering difference of 55% has a lot of reasons behind it, starting from the disadvantage of always being dependent on a support asset (oil in this case) that you cannot influence, continuing with different business models, which are obviously more adaptable (in the case of the Technology sector) to an ongoing dynamic and reshaping environment (unfortunately this time the reshape was produced by the SARS-CoV-2 virus). Future research on this topic is needed but the authors feel that the entire comparison between different business models from different sectors is worth a separate paper and it is impossible to summarize it in this article due to length constraints.

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Author Contributions

FCD and FMT conceived the study and were responsible for the design and development of the data analysis. FCD and FMT were responsible for data collection and analysis and for data interpretation. MB was responsible for the literature review section.

Disclosure Statement

The author has not any competing financial, professional, or personal interests from other parties.

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