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ENERGY MARKET DYNAMICS AS REFLECTED IN SELECTED EUROPEAN GLOBAL INDICES

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Abstract:

The energy market plays an important role in providing appropriate resources, both for the needs of each person and for the development of various economic agents. Such provision makes it possible for individual business entities to function normally, to develop the economy and to satisfy the basic needs of people. Energy resources include oil, gas, fuel oil, and coal. The sale of these resources is carried out through their free sale on the market using various instruments in the form of certain securities. For the purposes of energy market analysis, it is important to know the quotes of such securities, taking into account the peculiarities of the functioning of a certain market segment. Based on this, the work examines the dynamics of the energy market as reflected by individual European global indices. The article presents the dynamics of individual indicators of the corresponding indices and conducts their comparative analysis. This allows you to determine the best time to enter the market. The work presents various graphs and diagrams that allow you to understand the progress of the study and evaluate the results obtained.

Key words: Dynamics, Stock indices, Comparison, Analysis, Oil, Gas, Stock market, Energy market

Introduction

Various resources play an important role in the development of society and its individual economic structures. Among such resources, a special place is given to energy resources, such as oil, gas, coal, fuel oil [1], [2]. These resources are both the basis for processing and transformation into other types of energy, and the basis for the production of various chemical compounds. Such resources are the raw material base for certain types of production, which determines their constant and growing demand from humanity, technological processes and economic development. Ultimately, this determines the interest in this research topic and its practical significance. Therefore, consideration of any issues on this topic is relevant.

The sale of energy resources is carried out in a separate segment of the stock market through the purchase and sale of relevant securities [3]-[5]. Such a market is well structured and is determined by the characteristics of each region where the relevant securities are traded. One of the interesting regions is the European region, which has recently undergone significant transformations.

To analyze trends that reflect the dynamics of the corresponding segment of the energy market, it is advisable to consider the values of global indices. These values reflect securities prices

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for a range of energy resources. For the purpose of analysis, you can use both classical approaches and methods [6]-[15], and those that have proven themselves in other studies [16]-[19]. Moreover, in the latter case, the methodology for conducting such studies is attractive. Another important point in the analysis is the comparison of the dynamics of various indices. This helps to better understand the dynamics of market development and justify market entry strategies. Various procedures can also be used for such analysis [20], [21].

Thus, the main goal of this work is to study the dynamics of the energy market as reflected by selected European global indices. However, before moving on to such a consideration, we will analyze several related robots on this topic.

Related work

The European energy market, its problems and development trends are constantly in the spotlight of scientists.

In his study, B. Eberlein examines in detail the process of formation and development of the European energy market [22]. This is done through the prism of the interaction of management and government influence on this process. Thus, the issue of the effectiveness of sectoral management and the necessary measures to improve the effectiveness of such regulation are discussed. From that point of view, the dilemma between increasing market surveillance and promoting competition is considered.

G. Pepermans pays attention to the liberalization of the European energy market [23]. For this purpose, the experience and emerging problems in the development of such a market are studied. The work notes that there are still a number of significant obstacles to the liberalization of the European energy market. Particularly at the retail market level, additional efforts are needed to increase retail competition. Additional efforts are also needed to physically integrate existing regional markets [23]. Therefore, the EU should intensify efforts to harmonize and integrate electricity markets and electricity market policies [23].

M. Kanellakis, G. Martinopoulos and T. Zachariadis provide a detailed review of European energy policy [24]. The authors carry out such an analysis through a brief historical background in the period 1951-2-12. It examines the principles of policy development and the consultations that take place before proposing each option for possible changes in the functioning of a given market. In this case, special attention is paid to: renewable energy sources, energy efficiency, energy saving, safety, environmental protection [24].

S. Soeiro, and M. F. Dias explore the interactions and consequences of the impact of renewable energy sources on the European energy market [25]. This is due to the fact that in modern conditions there is a transition to a new energy system. This leads to deep involvement of individual consumers or citizens in a community-based initiative. But here it is necessary to take into account the unequal development of the energy market in individual countries. Therefore, understanding citizen energy initiative is important.

A. Spelta and M. E. De Giuli study the relationship between renewable energy and the price of fossil fuels [26]. The article examines data from the European energy market. For these purposes, data comparison is carried out using tools obtained from wavelet analysis. The authors use the European Renewable Energy Index and the MSCI Europe Energy Index for comparison. The results show the existence of regions with significant joint motions between rows. This allows us to assess the efficiency of the energy market as a whole.

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T. T. Thanh and V. M. Linh analyze the sources of volatility in the European energy market [27]. The authors apply an extension of the joint coupled TVP-VAR approach. The paper examines the relationship between four markets: energy, crude oil, gold and silver. The data covers the period 2018-2021. The silver market has been shown to act as a net transmitter of spillover shocks to the energy market during periods of uncertainty [27]. At the same time, the authors note that pairwise connectivity emphasizes the importance of crude oil, gold and silver as net transmitters of the consequences of shocks in the energy market [27].

M. E. De Giuli and A. Spelta analyze Wasserstein barycenter regression to estimate the joint dynamics of renewable and fossil fuel energy indices [28]. At the same time, the authors note the presence of nonlinear dynamics in the data under study. It is for the analysis of such data that Wasserstein barycenter regression is used. The object of the study is the efficiency of the European energy market, where renewable energy and fossil fuels are present. The methodology proposed in the work makes it possible to evaluate, first of all, the time structure of conditional joint distributions. This expands the possibilities for conducting appropriate analysis.

Thus, we see different directions in the study of the European energy market. This allows us to understand the features of its functioning and development. It should also be noted that various approaches are used for the corresponding analysis, which makes it possible to study various factors influencing the energy market. Therefore, any new research is important in the overall process of studying such a market.

Selected European global indices as a reflection of energy market dynamics

For the purposes of further research, we will consider some European global indices that characterize the corresponding segment of the energy market. All data is taken from the site https://www.investing.com/.

In Fig. 1 shows the dynamics of the values of such indices as BNY Mellon European Oil & Gas ADR (BKEOG) and Dow Jones Europe ex-UK Oil & Gas (E2ENE).

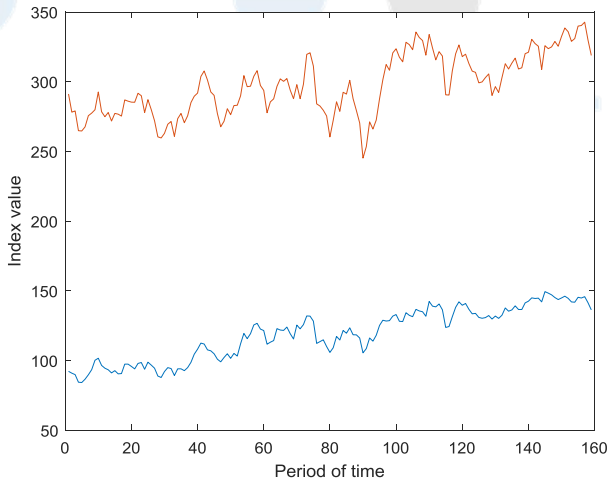

Figure 1: Dynamics of BKEOG and E2ENE index values

First of all, it should be noted that various stock indices are considered that characterize the development of the European energy market. Such indices differ in the methodology of their

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calculation and the coverage of the various securities that make up them. This allows us to better understand the dynamics we are exploring.

In Fig. 1 dynamics of the BKEOG index are displayed in blue, and E2ENE in red. In this case, we continue to consider the average values of the indices in their weekly calculations for the period 01.03.2021-01.14.24. This period allows us to fully assess existing trends.

In general, the dynamics of the BKEOG and E2ENE indices is slightly increasing. At the same time, for each data series such dynamics are special and different from one another.

The dynamics of the BKEOG index have insignificant volatility, given that the index values have increased by approximately 60% over the analyzed period of time. There are also no sharp changes in the values of this index. Based on the data on the BKEOG index, it should be noted the progressive growth in the dynamics of the European energy market.

The dynamics of the E2ENE index are more volatile. The index values over the studied period of time increased by 24%. At the same time, we also note sharp fluctuations in the values of this index at certain time intervals. Based on the dynamics of the E2ENE index values, we can say that the European energy market is significantly influenced by external factors.

Thus, here we see that a necessary stage of the study is to conduct a comparative analysis of the dynamics of various energy indices of the European market. This will allow us to better understand the dynamics of the market and the possible conditions for optimal entry into such a market.

In Fig. 2 the performance of the EURO STOXX Oil & Gas EUR Price (SXEE) index is shown in blue, and the MSCI Europe Energy NR USD (MIEU0EN00NUS) is shown in red.

It should be noted that there is significant volatility in the dynamics of both indices. The growth of such indices is also significant. One can also note approximately the same dynamics of such indices.

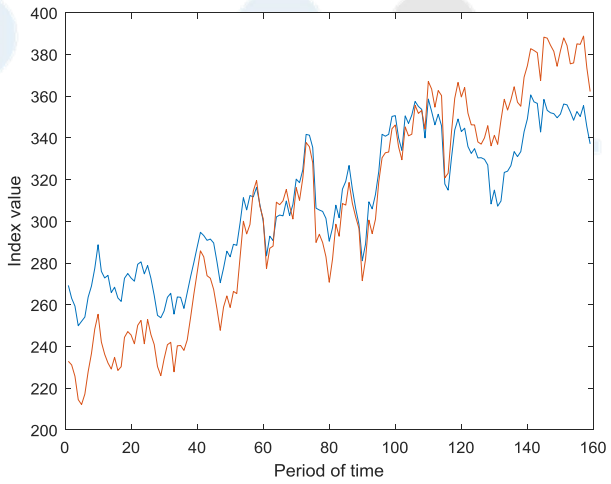

Figure 2: Dynamics of SXEE and MIEU0EN00NUS index values

In Fig. 3 The performance of the FTSEurofirst 300 Oil & Gas (FTE3X60) index is shown in blue, and the STXE Oil & Gas NR (SXER) is shown in red.

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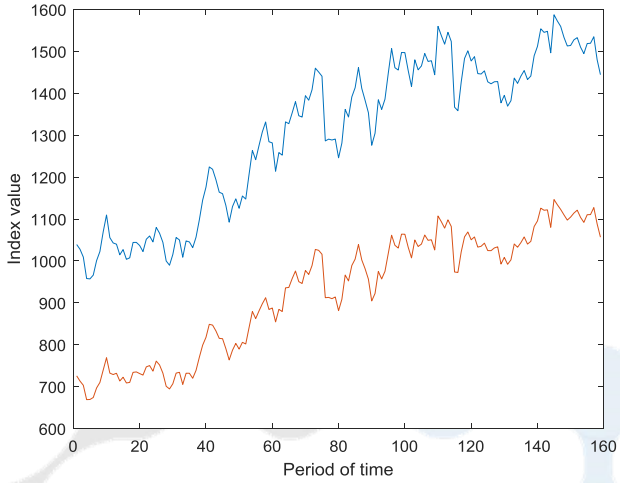

Figure 3: Dynamics of FTE3X60 and SXER index values

Here there is a positive dynamics in the values of the studied indices, as in the previous case. At the same time, the increase in index values is significant. This confirms the thesis and the significant influence of external factors on the functioning and development of the European energy market.

Comparative analysis of the dynamics of the values of individual global indices of the European energy market

For the purpose of conducting a comparative study of the dynamics of individual data series, it is advisable to use the wavelet analysis methodology. Here we should highlight wavelet coherence estimates, which are widely used in such studies [29]-[34].

In Fig. 4 shows the estimate of wavelet coherence for the data series shown in Fig. 1. It should be noted that there is complete consistency between the data that characterize the dynamics of the values of such European market energy indices as BKEOG and E2ENE. This consistency is typical for all time intervals and also extends to a significant depth of interconnection of such data.

In Fig. 5 shows the wavelet coherence estimate for the data in Fig. 2.

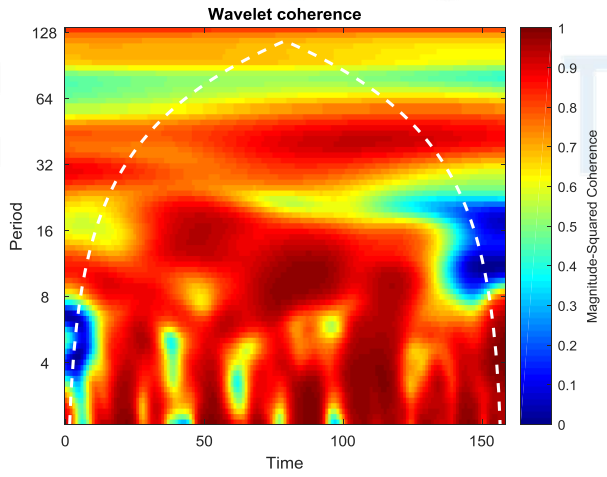

Figure 4: Estimation of wavelet coherence between BKEOG and E2ENE

Data Fig. 5 indicate even greater consistency in the dynamics of the values of such European energy indices as SXEE and MIEU0EN00NUS.

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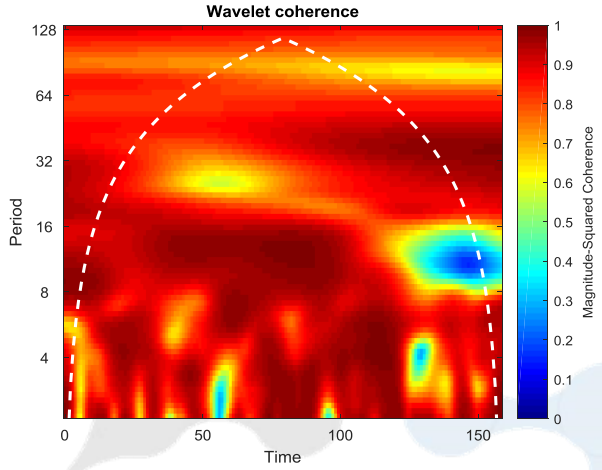

Figure 5: Estimation of wavelet coherence between SXEE and MIEU0EN00NUS

Here there is absolute consistency between the relevant indices of the European energy market. This consistency is evident throughout the time-frequency domain. It is characteristic both for the entire time axis and for the entire depth of connections between data.

A similar situation is typical for the dynamics of data values that display quotes for the FTE3X60 and SXER indices.

This confirms the thesis about the significant influence of identical factors on the dynamics of changes in such indices, and therefore on the functioning of the energy market as a whole. We can also talk about the same trends in the development of the European energy market in terms of their respective indices.

Then the strategy for entering such a market will be the same, taking into account the dynamics of different indices. The prevailing factor is only the quotes for such securities. It is then possible to protect riskier transactions less valuable securities. In other words, use some strategy for hedging risks.

In general, it should be noted that it is advisable to consider the dynamics of the energy indices of the European market as an object of analysis and study of possible trends in its functioning and development. This emphasizes the objectivity of this study.

Conclusion

The article examines current issues of the functioning and development of the European energy market. Based on a brief but critical literature review, the complexity of this issue is shown.

In order to study the European energy market, a number of its global indices were considered. Analysis of the dynamics of such indices allows us to determine the main trends in the development of this segment of the European market. It is shown that this market is under the influence of the same influencing factors. A characteristic feature of the European energy market is the volatility of index quotations and their significant growth over a relatively short period of time.

A comparative analysis of the dynamics of European energy market indices demonstrates their close relationship with each other. This allows you to determine your market entry strategy and the ability to hedge risks.

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