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IMPACT OF ENERGY RESOURCES PRICES ON THE CERTAIN COUNTRIES' BALANCE OF PAYMENTS STRUCTURE AND DYNAMICS

The cost of energy resources is analyzed. The balances of payments of certain countries are examined. The impact of energy prices on the countries' balance of payments is analyzed. Patterns and significance of energy prices influence on balances of payments are determined. Conclusions are drawn regarding the degree of influence and significance of energy prices in certain countries.

Key words: energy resources, cost, balance of payments, dynamics, countries.

Formulation of the problem. Nowadays, energy resources are very important components of economic relations and welfare of countries. Instabilities or certain changes in energy prices make significant impact on countries' economies. They may destabilize the whole economic system and indicate problems in other spheres. Because of that it is vital to understand how strong the influence of prices on the energy resources is in the countries connected with energy business. To make it clear, balance of payments and its dynamics should be considered and analyzed. It demonstrates the country's trade and general economic health.

Then the conclusions can be made about how much the energy resources' prices impact on economies and in which cases such influence is positive or negative. Further research may analyze and study how positive results of the impact can be obtained or negative effects can be avoided. It will have practical advice for countries considering increasing their economic stability.

Analysis of recent research and publications. Theoretical aspects of analyzing the energy resources' prices influence on economies were studied by many scientists. The list of them includes K. Rogoff, E. Dvir 'Three Epochs of Oil', Ronald A. Ratti, Joaquin L. Vespignani 'Oil

prices and global factor macroeconomic variables', D. Janvan de Ven, R. Fouquet 'Historical energy price shocks and their changing effects on the economy', G. Tverberg 'Continuously Rising Energy Costs Will Cripple The Economy', R. Inglesi-Lotz 'The impact of renewable energy consumption to economic growth: A panel data application', Ronald A. Ratti, Joaquin L. Vespignani 'OPEC and non-OPEC oil production and the global economy' and others [1–6].

Unresolved problems of the research. There is a vast variety of research on how energy influences the economy. But this research will focus specifically on analysis of how energy prices impact the countries' balances of payments. Previous studies were not specialized on countries' balances of payments dynamics and their correlation to energy prices.

The goal of the research is to analyze and to study the impact of the energy market on the economy and the balances of payments dynamics of certain countries.

Presentation of the main material of the study. The prices on natural gas, coal and oil are influenced by a number of other energy commodities and conditions of the market. So the prices on energy resources depend on a huge number of factors and it makes the energy market quite unstable and

unpredictable sometimes. However, there are still certain correlations and patterns that should be taken into consideration while talking about energy market pricing.

The research of D. Janvan de Ven, R. Fouquet 'Historical energy price shocks and their changing effects on the economy' considered the energy price abrupt changes and its influence on economic indicators such as import and GDP. It was stated that when the oil is getting more expensive, consumption of goods decreases. It effects negatively on GDP and so on the balance of payments of countries where the oil is imported [3]. And the following research will consider the opposite situation when the energy is being exported.

This research and events in the past show, that instabilities in oil market reflected on the whole world's economy. It means that most countries, especially those producing energy products suffered the most. It should have influenced on their balances of payments too. But nowadays, technology changes with a very high speed and every part of industry has been modernized. It seems that all potential problems can be preliminary monitored and fixed by machines and scientists. However, we still see that there is present a vast variety of risks which influence the world market and that the consequences are being hardly corrected.

There are present political, geopolitical, environmental, demand and supply, cost and other risks that may provide instabilities and raise different kind of problems. Because of that, countries and companies involved in energy business should carefully use risk management and be able to adapt to new external or even internal factors. This provides them new opportunities in further development of their business; otherwise, countries are going to have crisis.

The most important thing to be underlined is that oil prices have significant influence on the global natural gas market and its pricing. The evidence to the statement above is that a large number of long-term gas contracts historically have been indexed to the price of oil in Europe and Asia. Because of that, the oil prices instabilities affect gas prices of the global gas market noticeably.

The coal market is also known to be global. It is traded around the world, however to make it more efficient it was divided in two regional market. As it is generally known, these international markets are Atlantic and Pacific market. The reason to create the mentioned division was to get lower the prices through elevation of transportation efficiency. Owing to that, the transportation became much easier and cost-effective, as it is the main share of coal delivering price.

Another important feature of the coal market is that the coal prices have always been more stable and lower than prices on oil and gas. It is known to be one of the most affordable fuels. It is especially useful for developing countries as their neediness in energy is much higher despite the fact of considerable expenses [7].

The natural gas market also has its distinctive features. There are a lot of particular gas markets all around the Earth. There was seen a correlation in prices among them, however, it has eroded since 2009. The reason is to present different pricing systems. They demonstrate appropriate market circumstances and limited excess to arbitrage. There is an oil-indexed pricing system that is present on Asian market. It means that the prices

are determined in response to the change of oil demand and supply by oil market spot prices.

Despite this, the USA prices are primarily based on the North American gas market. The prices on the latter market are determined in gas-on-gas based prices. It means that there is a competitive process between numerous natural gas suppliers. The same trend is seen on the UK market. The prices are also gas-on-gas based; however the difference in continental Europe is that it is more influenced by oil-indexed prices when arbitrage opportunities exist.

The main feature of oil market pricing is that oil is not used directly. This causes certain difficulties in determining its value. It also introduces specific institutional features of formation of the international market of this product. The value is determined by the price of its petroleum products. In turn, the very pricing does not entirely depend from the real supply and demand of the market. It depends in greater extent on the exchange mechanisms [8].

By analyzing energy market pricing history the further conclusion can be obtained. All fossil fuels prices fell worldwide in 2015 and 2016. Crude oil prices have experienced the largest percentages decline since 1986 - the Brent oil average price fell down to 47%, which reflected on the growth of imbalance between the world supply and demand. With the largest decrease of percentage in the North America, natural gas prices fell in all regions. Coal prices have also fallen worldwide during the four recent years but the decline was not that significant [9].

According to the graph below, different trends in energy sources prices are seen. The energy prices data was taken from the International Energy Agency and converted into USD per million BTU to make the comparison possible [10]. First of all, the illustration demonstrates certain instability in prices of the given three kinds of energy resources; however, the biggest one is seen in the price on oil. The price was relatively stable from 2012 to 2014 but in 2015 a sudden significant decline happened. The price fell down from around \$27 to \$16 per million btu. The decline continued and the lowest price of nearly \$14 per million btu was pointed out in 2016. But then it started to rise and reached almost \$18 per million btu in the beginning of 2018. All of these trends can be seen from Figure 1.

To analyze the influence which energy market has on countries it was decided to take into consideration balances of payments dynamics of countries, which economies are largely dependent on energy business and in which energy products compose the biggest share of export. Thus, the connection and correlation of this sector with the economy would be much more obvious than while analyzing other economies. The balance of payments gives an idea of the country's participation in the world economy, the scale, the structure and nature of its foreign economic relations. What's more, it reflects structural imbalances in the economy that determine the different export opportunities and the needs for importing goods, capital and services.

Considering that energy producing countries' exports are mainly composed from energy products, it certainly influences on the countries' balance of payments state. The prices for energy products influence exports on a very large scale, in turn. The export volume affects the countries' income and further possible national consumption and

the import accordingly. The export prices also influence the competitive position of the country on the world scale. It means that those countries in energy business are highly dependent on the prices of the product they produce. And these facts are reflected on the balance of payments.

Taking into consideration stated above, further countries were chosen for their balances of payments analysis. These are Saudi Arabia, Russia and Qatar. The balance of payments data was taken from International monetary fund [11]. The total balances of payments of these countries were analyzed. The oil prices data was taken from the International Energy Agency [10].

It can be seen from Figure 1, that coal prices are mainly stable along the whole analyzed period. The gas prices did not have such significant changes as oil prices along this period too. So it would be rational to consider the oil prices changes and to seek correlation of chosen countries' balances of payments with them.

Using the graphic analysis method, the balances of payments' dynamics show approximately common trends in balances of payments of energy producing countries to the oil prices dynamics, as it can be seen on Figure 2. Oil products constitute nearly 70% of Saudi Arabian exports [12]. It means that oil price changes influence hardly the country's economy. It can be seen from Figure 2 that trend of Saudi Arabian balance of payments is almost totally the same as the oil price's changes. But the balance of payments' reduction was even worse than oil price decrease. So the decrease of the exported energy resource prices certainly affected the Saudi Arabia's balance of payments and, moreover, on a larger scale than the oil price decreased. This situation can be explained by the fact that the prices decreased and the exports did not just stay the same, but even diminished because of the membership of Saudi Arabia in OPEC and its agreement with some other oil producing countries to decrease their oil production.

Turning to the Russian balance of payments dynamics, such trends were obtained. Oil products make up nearly 50% of Russian exports [12]. This country's balance of payments trend does not match that much with the oil price changes as the previously researched country's balance of payments did. The trends are nearly common during 2012-2013 and 2015-2017. But during 2014-2015 and 2017-2018 they differ. It is known that there were sanctions implemented on Russia by European Union. Because of this both exports and imports have diminished. And despite that oil prices and exports decreased, even more significant reduction happened to Russian imports abruptly. That is the reason of the correlation absence during the period of 2014-2015. And in spite of the oil

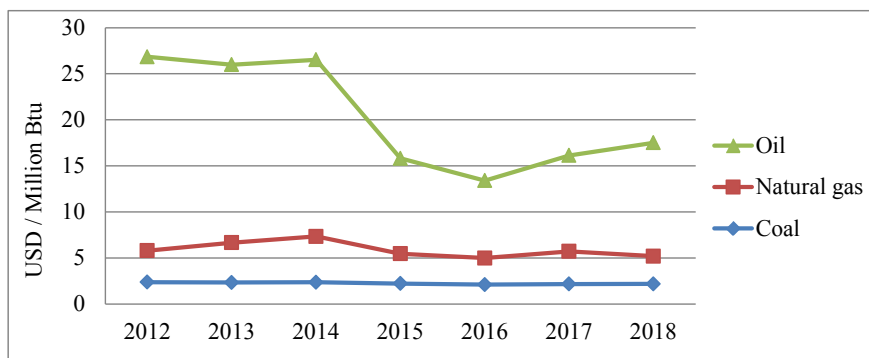


Figure 1. Power Generation Fuel Costs, USD per Million Btu

Source: [10]

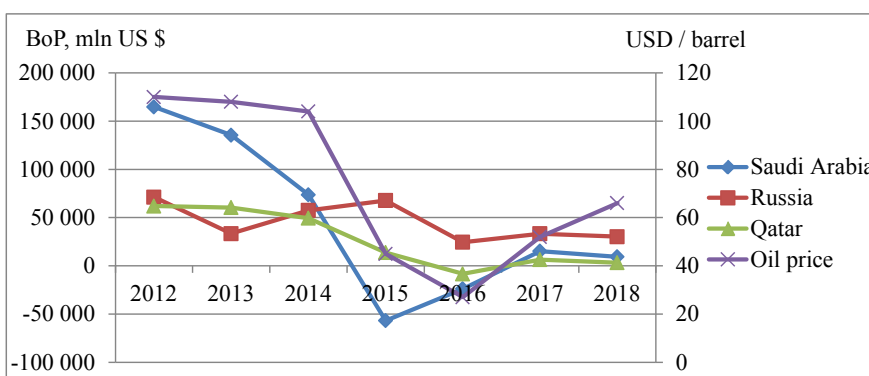


Figure 2. Balances of Payments to Oil Prices Correlation

Source: [10; 11]

prices increase during 2017-2018, Russian balance of payments remained the same.

Now, looking at Qatar, further features can be determined. Oil products make up more than 85% of Qatar exports [12]. This country's balance of payments dynamics is more stable than the Saudi Arabia's. However, the correlation still strongly persists. Its balance of payments was negative in 2016 but the Saudi Arabia's one was much far below zero from second part of 2014 and until second part of 2016.

To ensure that the correlation between chosen countries' balances of payments and oil prices exists, another kind of the statistical analysis can be used. By using correlation method the following results were obtained. Results from the Table 1 show, that there is very high correlation between Saudi Arabia and Qatar's balances of payments and oil prices. It is approximately 0.92 and 0.95 respectively. And that means that the correlation has direct dependency and strong because the coefficients are very close to 1. However, Russian balance of payments does not have that strong correlation with oil prices, as its correlation index is only 0.4. So it is closer to 0 and it means that the correlation is also positive but much lower.

Table 1

**Balances of Payments to Oil Prices
Correlation Indexes**

Country	Correl. Index
Saudi Arabia	0.915876
Russia	0.404961
Qatar	0.952408

Source: [10; 11]

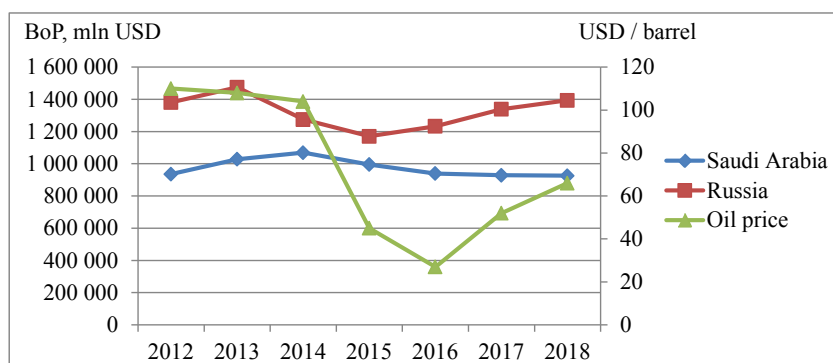


Figure 3. Investment Position to Oil Prices Correlation

Source: [11]

The described situation makes it obvious that the energy resources prices and exactly the oil prices changes have significant and undeniable impact on the balances of payments of energy producing countries. Despite Russian Federation has many other reasons of its balance of payments changes, the oil prices influence still can be seen. It means that prices on energy show up economic instabilities and weak sides that these economies have. The main weakness is one main product focus and insufficient diversification of national industries. These countries should develop other business areas and support small and middle-sized business, then the effect of energy prices changes will not be that significant.

It can be also assumed, that the investment position of the countries changes in line with the balance of payments. It means that the instability and the economic situation of the country influence investors who invest their free capital in economy to gain some reasonable profit. However, the economic imbalance makes those businessmen aware of the danger to lose the capital and they start to seek ways to make their investments safer. And this reflects in capital outflow and changing investment position of the country. To prove what is written above the investment position of Saudi Arabia and Russia were taken from International Monetary Fund (IMF) to analyze their correlation to changes in oil prices. Unfortunately, IMF did not provide data about Qatar's investment position and because of that it was not included into analysis.

The received results are following. As it is seen from the Figure 3, the investment position of Saudi Arabia and Russia was changing slightly. Comparatively, there were no abrupt increases or decreases. It can be explained by long term investments, confidence of investors in the energy industry, that it will not stop its existing, and considerable amounts of capital being invested in the countries, which are not that simple to withdraw and find another investment variant. What is more, it may be said that countries' investment positions returned to the same level which they have in 2012.

However, the correlation and connection between the changes of countries' investment positions and changes in oil prices somewhat persists. Considering Saudi Arabian investment position, it was increasing from 2012 to 2014 and then it was slightly decreasing. During 2016-2018 it was approximately on the same position. The oil prices correlated to the Saudi Arabian investment position during 2012-2016. But when the rise of oil prices started, investment position remained on the

same level as investors were not ready to return investments and the confidence in energy sector has fallen a little.

As for the Russian investment position changes, in contradiction to the Saudi Arabian one, the correlation to oil prices changes is seen during the second part of the graph. Its investment position started to decline considerably in 2013, when oil prices abruptly fell in 2014. The rise of investment position began a year earlier too. Russian Federation has other energy sources such as gas and coal and it is quite large to be subjected to different effects and

outside influences that are caused by a variety of factors. But certain trends' similarities can be observed still.

By using correlation method here to find out the strength of correlation, the following results were obtained. Results from the Table 2 show, that there is not that strong correlation between investment position and oil prices which the balances of payments have. The correlation coefficients of Saudi Arabia and Russia are around 0.49 and 0.64 respectively. Russian investment position has stronger correlation than Saudi Arabian but they are both positive which means direct dependency. So the results demonstrate that the dependency persists but it is medium.

Table 2

Investment Position to Oil Prices Correlation Indexes

Country	Correl. Index
Saudi Arabia	0.492502
Russia	0.636022

Source: [10; 11]

Conclusions. Energy prices are influenced by a variety of factors. And the pricing of energy products is very important for energy producing countries. It reflects on their economies and, that have been proved by the above research, on their balances of payments. The balance of payments, in turn, represents the rate of country's participation in the world economy, the structure and nature of its foreign economic relations. The researched energy producing countries, which are Saudi Arabia, Russia and Qatar, have oil as a significant part of their export. The analysis of these countries' balances of payments to oil prices correlation proved that the correlation persists indeed. All these countries' balances of payments revealed the same trends as the oil prices changes. Moreover, the investment position changes trend during 2012 to 2018 correlated to the oil prices changes too.

Further researches may analyze and study positive and negative results of the energy resources' prices impact and how benefits can be obtained or negative effects can be avoided. It will have practical advice for countries concerning their economic stability. In other case, further research may consider ways of monitoring, predicting and preventing of potential instabilities, risks and other specific problems that may occur or become the result of the instabilities.

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ВПЛИВ ВАРТОСТІ ЕНЕРГОРЕСУРСІВ НА СТРУКТУРУ ТА ДИНАМІКУ ПЛАТІЖНИХ БАЛАНСІВ ОКРЕМИХ КРАЇН

Резюме

У статті проаналізовано вартість енергетичних ресурсів. Досліджено платіжні баланси окремих країн. Вивчено вплив цін енергоресурсів на платіжні баланси розглянутих країн. Визначено закономірності та значимість впливу зміни цін на енергоресурси на платіжні баланси. Сформульовано висновки щодо ступеня впливу і значимості цін на енергоресурси в економіках окремих країн.

Ключові слова: енергоресурси, вартість, платіжний баланс, динаміка, країни.

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ВЛИЯНИЕ СТОИМОСТИ ЭНЕРГОРЕСУРСОВ НА СТРУКТУРУ И ДИНАМИКУ ПЛАТЕЖНЫХ БАЛАНСОВ ОТДЕЛЬНЫХ СТРАН

Резюме

В статье проанализирована стоимость энергетических ресурсов. Исследованы платежные балансы отдельных стран. Изучено влияние цен энергоресурсов на платежные балансы рассматриваемых стран. Определены закономерности и значимость влияния изменения цен на энергоресурсы на платежные балансы. Сформулированы выводы относительно степени влияния и значимости цен на энергоресурсы в экономиках отдельных стран.

Ключевые слова: энергоресурсы, стоимость, платежный баланс, динамика, страны.