
CONTEMPORARY CHALLENGES FOR THE ECONOMIC SECURITY
OF ENTERPRISES IN POLAND¹

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Abstract. The article presents a multidimensional comparative analysis of the exchange rates of five currencies: dollar, euro, franc, pound and ruble in zlotys and crude oil in dollars per barrel from 2005 to 2022. The research was conducted in terms of the identification of contemporary challenges for the economic security of enterprises in Poland. Grouping was used as part of multidimensional comparative analyzes. In the categorized line charts, in order to observe the trends in dynamic terms as a decrease and an increase in the rates of the analyzed data, a separate Y-axis scale was assigned to each of the analyzed dependent variables.

Keywords: economic security, multidimensional comparative analyzes, financial crisis in the United States, COVID-19.

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JEL Classifications: O10, O11

1. Introduction

An enterprise is an organizational unit that conducts economic activity, legally, organizationally, territorially and economically, including human, financial, tangible and intangible resources (Encyclopedia of Management, 21/03/2022). The research focuses on the study of enterprises in Poland in terms of the analysis of four events influencing the exchange rates of currency and crude oil exchange rates in terms of the determination of contemporary challenges for economic security.

This became a premise for the formulation of the research problem of the study: To what extent will the development of a multidimensional comparative analysis allow for the observation of fluctuations in the rates of the analyzed dependent variables during the four events under consideration: the global financial crisis, the annexation of Crimea by Russia, the COVID-19 pandemic and Russia's attack on Ukraine? The aim of the study is to conduct a multidimensional comparative analysis of exchange rates: dollar, euro, franc, pound and ruble in zlotys and crude oil in dollars per barrel from 2005 to 2022 in terms of the determination of the challenges of economic security of enterprises in Poland.

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A research hypothesis was formulated for the adopted research problem and the purpose of the work:

The use of a multidimensional comparative analysis will allow for the observation of contemporary challenges for the economic security of enterprises in Poland. The article uses the research method of a multidimensional comparative analysis which is grouping.

2. Analysis of the literature on the research subject

Between 2005 and 2022, there were four events in the world that can be defined as random phenomena affecting currency exchange rates as well as the economic situation of respective countries.

The first event was the financial crisis in the United States in 2007-2009 (Dziennik.pl, March 21, 2022). It entered the subprime mortgage market in mid-2007. It was caused by the low interest rate on loans (Węclawski 2013, pp. 219-228), which were granted to borrowers who did not have the financial capacity to repay them. At that time, real estate prices showed a strong upward trend. During the crisis in the United States, banks began to take over real estate whose loans were unpaid and once again put them up for sale to people without financial security (Zalewska 2008, March 21, 2022). This led to the collapse of the world's largest economy and the emergence of the global financial crisis. Developing countries such as Poland, as a result of the impact of the crisis, had a limited inflow of foreign funds from investors in terms of broadly understood development.

Another event that affected the world economy, including enterprises in Poland, was the annexation of Crimea by Russia, i.e. the illegal incorporation of the Autonomous Republic of Crimea and the city of Sevastopol by the Russian Federation in 2014. This led to the imposition of sector sanctions on Russia by the United States and the European Union (European Council, March 21, 2022), the purpose of which was to weaken the banking and energy sectors as well as enterprises that supported the Russian Federation in destabilization of Ukraine (Money.pl, March 21, 2022). As a result, Russia imposed an embargo on food products from the European Union, the United States, Canada, Australia and Norway. In Poland, at that time, the crisis related to the annexation of Crimea affected enterprises operating in the food and agricultural sectors. As a result of Russia's seizure of Crimea, it ceased to pay fees to Ukraine for the stationing of the Black Sea Fleet on the Crimean Peninsula, amounting to approximately USD 100 billion per year, and had complete freedom in its expansion. Russia also took over the entire military infrastructure, including ports, and thus lowered fees for the passage of ships through the Kerch-Jenikalski Canal (Olszański, Sarna, Wierzbowska-Miazga 2014).

The third event is the emergence of the infectious disease COVID-19. Its first case was recorded in Wuhan, China in December 2019 (Zhu, Zhang, Wang, et al. 2020). As a result of the rapid spread of an infectious disease that directly threatened human life and health, on March 11, 2020, the World Health Organization declared the COVID-19 pandemic (Satomi, et al., April 2020). This led to great anxiety (Matuka, 2020; Okunola, Fakunle, 2021; Mikołajczak et al., 2021) and the introduction of many restrictions by respective countries of the world. At the beginning of the pandemic, international passenger air transport was suspended (Kozicki, Bryczek-Wróbel, 2020). This, in turn, resulted in very large decreases in oil prices caused by a huge reduction in demand for the raw material from countries around the world (Kingsly, Kouam, 2020). In respective countries, restrictions and orders have been introduced - the obligation to wear face masks (Serwis Rzeczypospolitej Polskiej, March 21, 2022), disinfect hands, measure temperature and procedures related to the appearance of symptoms indicating an infectious disease. All over the world, including in Poland, specialized hospitals began to appear (Stelmach, 15/07/2020), the purpose of which was to help citizens infected with the COVID-19 disease. The disease has led to a large number of deaths worldwide. In the United States, as a result of the COVID-19 pandemic, an increase in the unemployment rate in April 2020 to 14,7 percent was recorded (Kozicki, Mitkow, 2021). The increase from February 2020 was by 11,2 percentage points (Rynek pracy, March 21, 2022). In the literature, the unemployed are interpreted as people who are not employed, looking for a job, accepting the current salary for it (Begg, Vernasca, Fischer, Dornbusch 2014, p. 307). Such a dynamic increase in unemployment in the world's largest economy has not been recorded so far in the history of this country. The COVID-19

pandemic has also had a big impact on companies in Poland. The introduction of a lockdown in Poland in 2020 led to a disruption of supply chains, which resulted in the first recession in three decades. Enterprises tried to reduce the costs of their operation, as well as use government aid programs. During the pandemic, entrepreneurs introduced remote work, limited the number of employees, thus adjusting their products and services to the prevailing conditions, and also looked for new suppliers (See Jurgilewicz et al., 2021).

The fourth event is Russia's attack on Ukraine on February 24, 2022 (Business Insider, February 24, 2022). It began with the address of the President of Russia Vladimir Putin at 4.45, in which he announced the beginning of a special operation aimed at defending the people of Donbas against "genocide" and "demilitarization and de-Nazification of Ukraine" (Wilk, Domańska, 24/04/2022). In the morning, the Armed Forces of the Russian Federation launched an attack on military infrastructure facilities throughout the territory of Ukraine from the territory of Russia and Belarus. This led to the imposition of many sanctions by the United States, the European Union and other countries of the world. The most powerful ones concerned the disconnection of Russian banks from financial systems and the freezing of foreign financial assets. Russia was cut off from access to modern technology. Sanctions were imposed on those people and their families who benefited from Putin's policies. In addition, the number of troops and equipment units on the eastern wall of NATO, including in Poland, was increased. These actions led to a change in the strategy of the functioning of the armed forces of respective countries. There was a sudden and strong need for an increase in human resources and access to more hardware units based on new technologies. Russia's attack on Ukraine has led to a huge migration of people from Ukraine. The largest number of migrants, about 2,1 million people, went to Poland as of March 21, 2022 (Derewienko 2022). This, in turn, required large financial outlays from Poland to help the Ukrainian population escaping the war. The war in Ukraine also affected companies in Poland that cooperate with Russia, Belarus and Ukraine. The imposed sanctions and military actions make it impossible to make purchase and sale transactions, which in turn may lead to the collapse or transformation of enterprises in the long term.

The study attempts to conduct a multidimensional comparative analysis of the decline in exchange rates and crude oil prices from 2005 to 2022 during the impact of crises in terms of the maintenance of economic security and the determination of contemporary challenges for enterprises in Poland.

In the literature, economic security is considered to be the certainty of the survival and development of the state's economic system and the maintenance of its international position (Nurzyńska 2016, p. 22), while the multidimensional comparative analysis consists in ordering a relatively homogeneous set of objects in order to make decisions (Łuniewska, Tarczyński 2006, p. 22). 10).

The data obtained from the website of the National Bank of Poland concerning exchange rates was subjected to a multidimensional comparative analysis.

3. Multidimensional comparative analysis of currency and crude oil prices

The research began with Figure 1 and a categorized line graph of the exchange rates of five currencies: dollar, euro, franc, pound and ruble in zlotys from January 3, 2005 to March 16, 2022.

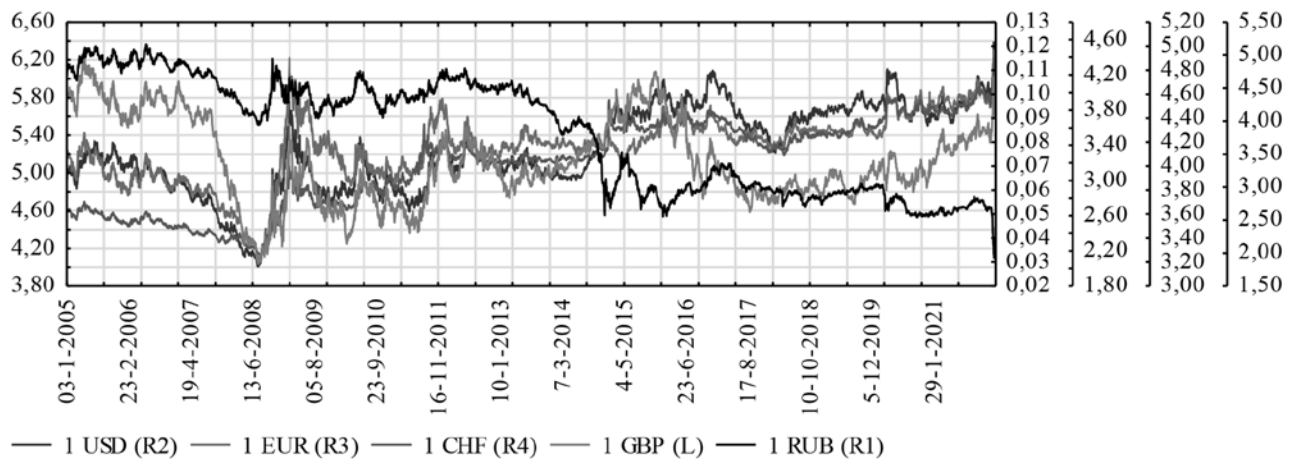


Figure 1. Categorized line chart of the exchange rates of five currencies (dollar, euro, franc, pound and ruble) in zlotys from January 3, 2005 to March 16, 2022 (left scale of the Y axis - the pound exchange rate; first right scale of the Y axis – the ruble exchange rate; second right scale of the Y axis - the dollar exchange rate; third right scale of the Y axis - the euro exchange rate; fourth right scale of the Y axis - the franc exchange rate)

Source: own study based on data obtained from the website: <https://www.nbp.pl/> (as of 16.03.2022).

The observation of data in Figure 1, in which separate Y-axis scales were assigned to each dependent variable (left scale of the Y axis - pound rate quotations; first scale of the Y axis - ruble rate quotations; second right scale of the Y axis - dollar rate quotations; third right scale of the axis Y - euro rate quotations; fourth scale of the Y axis - franc rate quotations) in order to observe the trends in the period from January 3, 2005 to March 16, 2022, allows the conclusion that strong fluctuations can be observed in the exchange rates in the period under consideration caused by four random factors:

1. the global financial crisis of 2007-2009;
2. annexation of Crimea by Russia - 2014-2015;
3. the outbreak of the infectious disease COVID-19 pandemic - 2020;
4. Russia's attack on Ukraine - from February 24, 2022.

The above random factors changed the functioning of the world economy, including enterprises in Poland.

The first studies covered the exchange rates of the dollar, euro, franc, pound and ruble during the impact of the global financial crisis in 2007-2009.

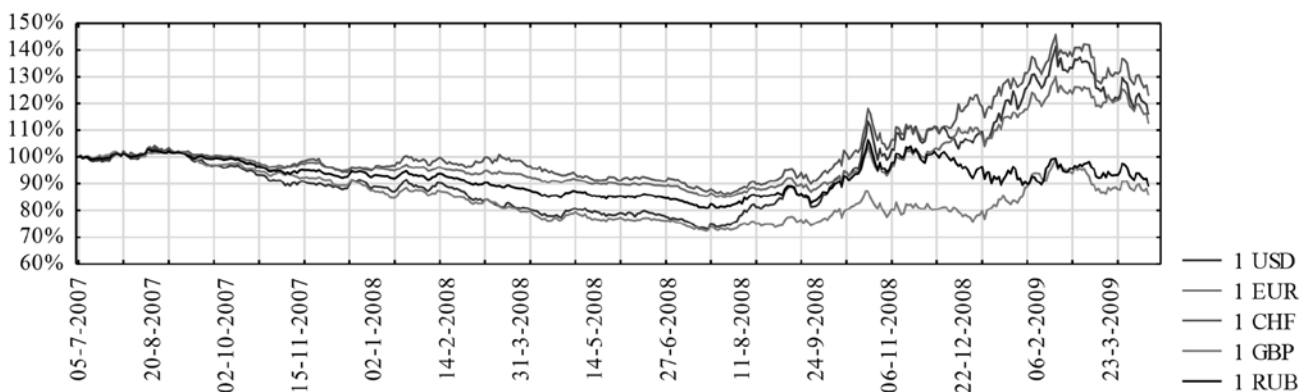


Figure 2. Categorized line graph of dynamics indices on a constant base of exchange rates of five currencies (dollar, euro, franc, pound and ruble) in percent during the global financial crisis from July 5, 2007 to April 15, 2009

Source: own study based on data obtained from the website: <https://www.nbp.pl/> (as of 16.03.2022)

In Figure 2, the dynamics indices on a constant base were used for the research. The quotations of the respective exchange rates under consideration on July 5, 2007 were a constant. The respective rates on that day were as follows (Fig. 1 - data considered in zlotys):

1 USD: 2,7593; 1 EUR: 3,7647; 1 CHF: 2,2759; 1 GBP: 5,5641; 1 RUB: 0,1076.

Figure 2 shows that since August 22, 2007 there have been declines in the quotations of five currencies. The indices of dynamics on a constant base in the considered time were as follows:

1 USD: 1,0005; 1 EUR: 0,9879; 1 CHF: 1,0003; 1 GBP: 0,9963; 1 RUB: 1,0079.

The smallest drops during the global financial crisis were recorded on August 11, 2008 as dynamics indices on a constant base at the level of:

1 USD: 0,7835; 1 EUR: 0,8657; 1 CHF: 0,8838; 1 GBP: 0,7477; 1 RUB: 0,8262.

From August 12, 2008, the quotations of the five analyzed exchange rates began, with only three currencies exceeding the level of quotation on July 5, 2007: the dollar (index 1,0195), euro (index 1,0162) and the franc (index 1,0219). Until the end of the analyzed period (April 15, 2009), the British pound and the Russian ruble were below the quotations assumed as the constant base.

Enterprises that at the time in question dealt with the export and import of goods from abroad and repaid bank loans or wanted to obtain them, had to be flexible and keep up with the changes. Those that did not adapt to the changes became ineffective and, as a result, declared bankruptcy. The data of the Central Statistical Office show that in 2008, more than one third of enterprises in Poland experienced a 50% decrease in revenues compared to the previous year. However, despite the global financial crisis, domestic enterprises are generally less indebted and use more equity than Western companies (PWC, April 9, 2020).

The second random event subjected to the study was the so-called annexation of Crimea by Russia. The research period and the observation of currency exchange rates were adopted from October 23, 2014 to December 31, 2015 (Fig. 3).

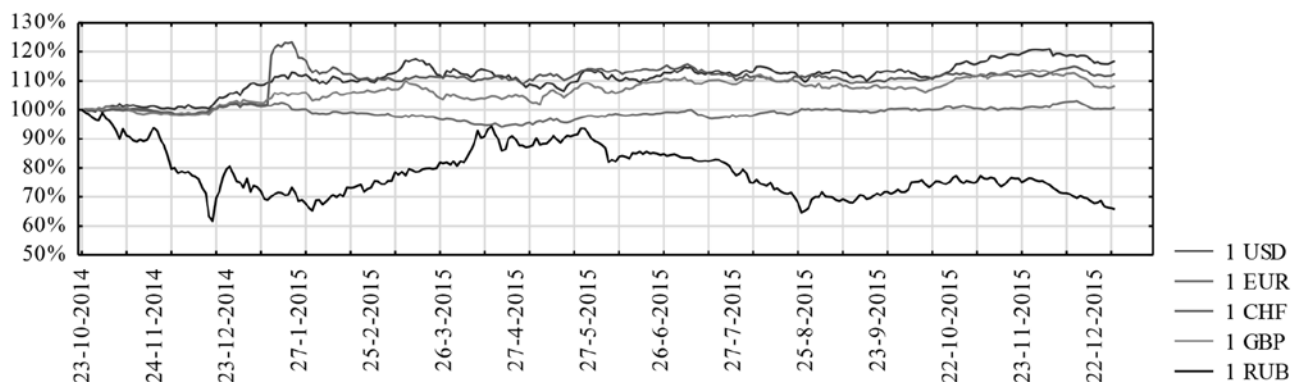


Figure 3 Categorized line graph of dynamics indices based on a constant base of the exchange rates of five currencies (dollar, euro, franc, pound and ruble) in percent during the annexation of Crimea by Russia from October 23, 2014 to December 31, 2015

Source: own study based on data obtained from the website: <https://www.nbp.pl/> (as of 16.03.2022)

The data presented in Figure 3 show that during the period of the annexation of Crimea, significant drops with certain deviations were recorded for the Russian ruble. The decrease from the level assumed as constant (PLN 0,0803) - 100% was to the level of PLN 0,052 (dynamics index on a constant base of 0.6575) on December 31, 2015. Figure 1 shows that the low level of the ruble exchange rate has continued in 2022 since the annexation of Crimea. The situation in enterprises in Poland during and after the annexation led to the appearance of new employees from Ukraine on the Polish market, as well as the strengthening of economic relations between Poland and Ukraine.

The next analyzed period in the analysis of quotations of five exchange rates was the emergence of the COVID-19 infectious disease pandemic (Fig. 4).

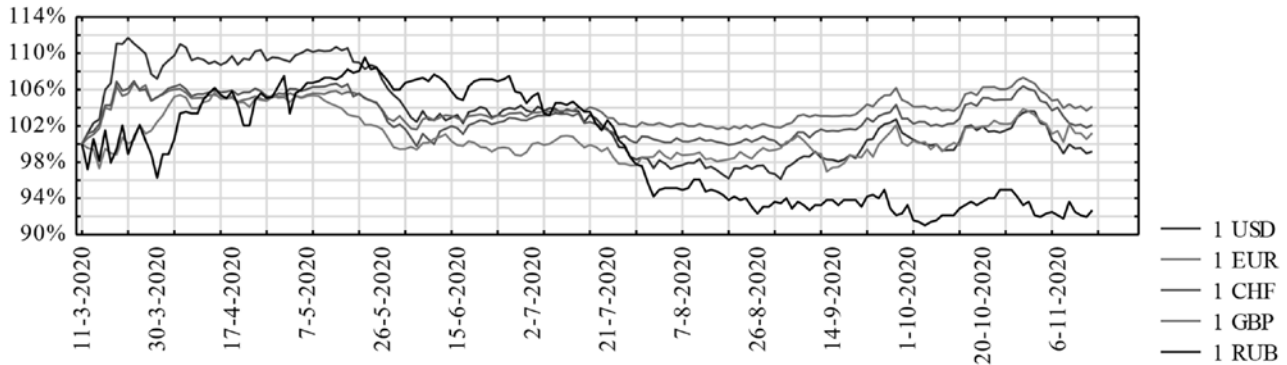


Figure 4. Categorized line graph of dynamics indices on a constant base of exchange rates of five currencies (dollar, euro, franc, pound and ruble) in percent at the time of the announcement of the COVID-19 pandemic from March 11, 2020 to November 17, 2020

Source: own study based on data obtained from the website: <https://www.nbp.pl/> (as of 16.03.2022)

The quotations of respective exchange rates on March 11, 2020 were a constant in the analysis.

The announcement by the WHO of the COVID-19 pandemic on March 11, 2020 led in the initial phase to an increase in the quotations of the exchange rates in question. The highest increases were observed for the dollar - to the level of the dynamics index of 1,1057 on May 18, 2020 (the dollar was quoted at PLN 4,2222). From that day on, the prices of all the currencies in question were declining. The COVID-19 pandemic had the greatest impact on the ruble exchange rate, which fell to the level of the dynamics index on a constant base of 0,92697, i.e. PLN 0,0495.

The COVID-19 pandemic also contributed to an increase in unemployment in respective world economies. The highest increase in the unemployment rate in the history of the United States was recorded in April 2020 - to the level of 14,7%.

In enterprises around the world, including Poland, an unprecedented increase in remote work with the use of various IT platforms has been observed. Until the outbreak of the pandemic, remote work was usually the case in large enterprises. As a result of the COVID-19 pandemic, entrepreneurs began to appreciate the importance of IT software as a tool allowing for the correct management of the company faced with fluctuations caused by various factors, such as e.g. changes in the volume of supply and demand.

The last period under consideration is the Russian attack on Ukraine since February 24, 2022 (Fig. 5).

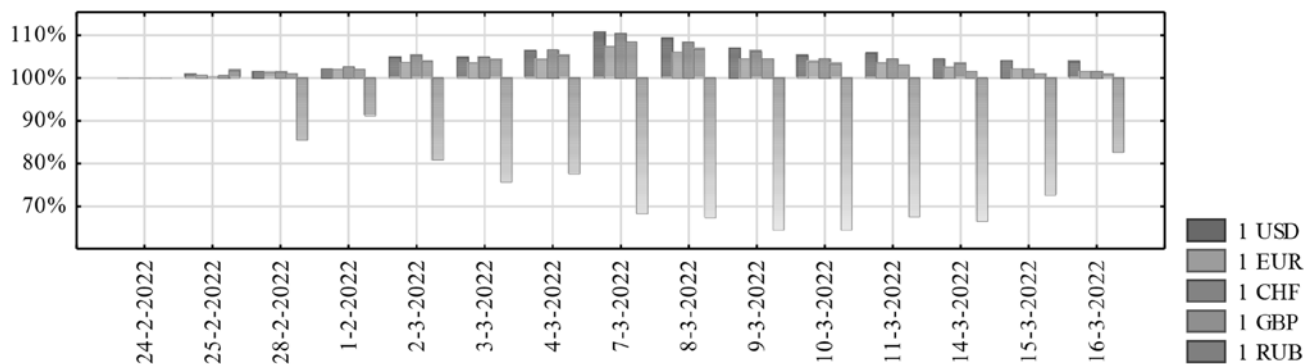


Figure 5. Categorized line graph of dynamics indices on a constant base of quotation of the exchange rates of five currencies (dollar, euro, franc, pound and ruble) in percent during the Russian attack on Ukraine (from February 24, 2022 to March 16, 2022)

Source: own study based on data obtained from the website: <https://www.nbp.pl/> (as of 16.03.2022)

The data compiled in Figure 5 on the quotations of five currencies shows that since the annexation of Crimea by Russia, Russia's attack on Ukraine has led to further strong drops in the ruble exchange rate. Ruble from the quotation of February 24, 2022: PLN 0,049 (dynamics index on a constant base 1) decreased to PLN 0,0405 (dynamics index on a constant base 0,8265) on March 16, 2022.

Russia's attack on Ukraine made the eastern market difficult and uncertain for Polish companies. Many investments were suspended in the Ukrainian, Belarusian and Russian markets, where about several dozen thousand companies with Polish capital were operating.

The above considered random events (crisis, annexation, pandemic and war) had an impact on respective global sectors of economies, as well as on crude oil prices - long-term strong increases or decreases in its prices cause rapid changes in the world's economies. The study attempts to analyze crude oil prices on a daily basis from January 3, 2005 to March 7, 2022 in terms of the dynamic impact of the above events (Fig. 6).

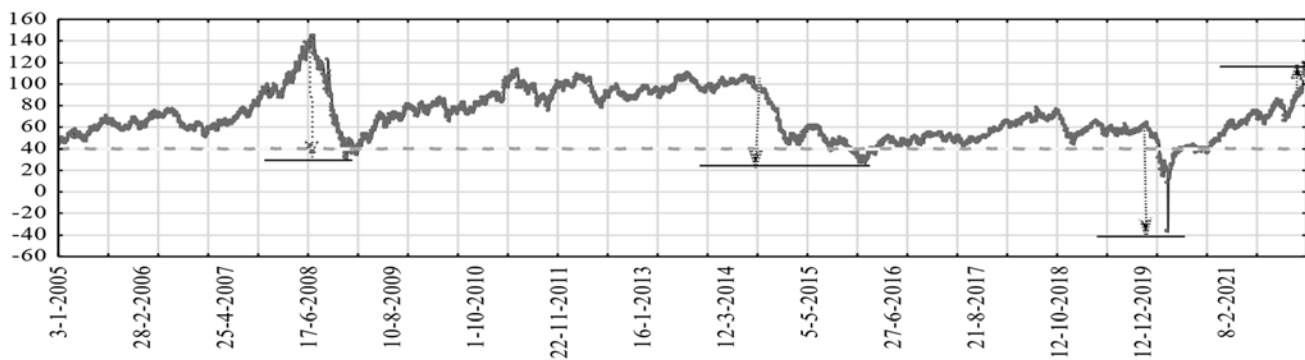


Figure 6. Categorized line chart of the price of one barrel of crude oil in dollars from January 3, 2005 to March 7, 2022 (yellow-green - a straight line function described by the formula $Y = 40$, means prices above which there is no loss in the sale of crude oil).

Source: own study based on data obtained from the website: <https://fred.stlouisfed.org/> (as of 16.03.2022)

Observation of the data presented in Figure 6 allows for the following conclusions. The global financial crisis led to a drop in crude oil prices from \$ 136,54 a barrel on June 18, 2008 to \$ 32,94 a barrel on December 24, 2022.

The annexation of Crimea by Russia also contributed to declines in crude oil prices. From July 28, 2014, prices fell from USD 105,68 per barrel to USD 26,19 per barrel on February 11, 2016.

The strongest and longest-lasting declines in oil prices were recorded during the impact of the COVID-19 pandemic. As of January 1, 2020, the price of crude oil has dropped from \$ 61,17 a barrel to a negative level of \$ 36,98 a barrel. It should be emphasized that from March 9, 2020 to July 1, 2020, the price of crude oil was lower than the cost of its extraction, i.e. below \$ 40 per barrel. By the end of November 2020, it was oscillating around \$ 40 per barrel.

Russia's attack on Ukraine on February 24, 2022 led to sharp increases in oil prices, caused by large sanctions imposed on Russia by the United States, the European Union, Japan, Australia, Great Britain and other countries. Tensions in relations between Ukraine and Russia and the uncertain situation on the border caused that on February 22, the oil price rose to the level of USD 92,11 per barrel. On March 24, 2022, the price of a barrel during the Russian-Ukrainian war was 115,3 dollars per barrel.

The price of crude oil for Polish companies is extremely important. Its increase causes the costs of, for example, the use of materials and energy, external services and others, and thus the profits to decrease. It should be emphasized that currently such high crude oil prices will have a negative impact on the functioning of transport and industrial enterprises that use this raw material.

4. Summary and conclusions

The research shows that from 2005 to 2022 there were four main events that influenced the functioning of world economies, including enterprises in Poland. The aim of the work has been achieved. The study covered the quotations of five currencies (dollar, euro, franc, pound and ruble) in zlotys and crude oil in dollars per barrel through the use of multidimensional comparative analysis.

In the case of the analysis of the global financial crisis between 2007-2009, it was observed that from August 22, 2007, there were declines in the quotations of five currencies. Constant-base dynamics indices over the time period considered were as follows: 1 USD: 1,0005; 1 EUR: 0,9879; 1 CHF: 1,0003; 1 GBP: 0,9963; 1 RUB: 1,0079. The lowest drops during the global financial crisis were recorded on August 11, 2008 as dynamics indices on a constant base at the level of: 1 USD: 0,7835; 1 EUR: 0,8657; 1 CHF: 0,8838; 1 GBP: 0,7477; 1 RUB: 0,8262.. The above crisis led to a situation where in 2008 one third of enterprises in Poland recorded revenues by 50 percent less than in the previous year. In the case of the annexation of Crimea by Russia, large drops in the Russian ruble were visible. The decrease from the level assumed as constant (PLN 0,0803) - 100% was to the level of PLN 0,052 (dynamics index on a constant base of 0,6575) on December 31, 2015. The situation in enterprises in Poland during and after the annexation of Crimea by Russia led to the influx of new employees from Ukraine on the Polish market, as well as the strengthening of economic relations between Poland and Ukraine.

In the case of the COVID-19 pandemic, it was observed that in the initial phase, increases in the quotations of the analyzed exchange rates, followed by their decreases, were visible. The pandemic had the greatest impact on the ruble exchange rate, which fell to the level of the dynamics index on a constant base of 0,92697, i.e. PLN 0,0495. In global companies, including Poland, an unprecedented increase in remote work with the use of various IT platforms has been observed.

On the other hand, Russia's attack on Ukraine led to further significant drops in the ruble exchange rate. The ruble from the quotation of February 24, 2022, PLN 0,049 (dynamics index with a fixed base 1), decreased to PLN 0,0405 (dynamics index on a constant base 0,8265) on March 16, 2022. Russia's attack on Ukraine made the eastern market difficult and uncertain for Polish companies. Many investments were suspended in the Ukrainian, Belarusian and Russian markets, where numerous companies with Polish capital were operating. On the other hand, the analysis of the daily crude oil price from 2005 to 2022 indicates large fluctuations in terms of the four events considered in the study. Large fluctuations for enterprises in Poland are of great importance, because the exchange rate affects the size of operating costs. Currently, such high crude oil prices will have a negative impact on the activities of transport and industrial companies using this raw material.

The above research results prove that the research hypothesis has been implemented. The use of multidimensional comparative analyzes made it possible to capture the contemporary challenges of the economic security of Polish enterprises.

According to the author of the study, the main challenge for Polish enterprises in 2022 in terms of economic security will be the maintenance of financial liquidity. The Polish economy will continue to show an upward trend, but most likely the growth rate will be lower than in 2021. It will be influenced by rising prices of raw materials, including high inflation, as well as high costs of transport, components and semi-finished products, as well as their availability. It is worth considering the extensive investments in terms of independence from strategic raw materials such as crude oil or natural gas obtained from the Russian Federation in terms of the maintenance of economic security of enterprises and the state. One of the solutions is signing long-term contracts with countries such as the United States, Saudi Arabia and Iran, and the construction of modern gas pipelines and storage terminals.

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