# Price trends for selected fuels and their dependence on oil prices

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## Abstract

Fuel prices are influenced by factors that have a broad impact on the economy. The aim of this thesis was to evaluate the development of gasoline and diesel prices in the Czech Republic between 2018 and 2024 and to determine whether a statistically significant relationship existed between Brent crude oil prices and the prices of these fuels. To achieve this aim, a quantitative content analysis of secondary data, Pearson's correlation analysis and a correlation heat map were used. The results showed substantial price fluctuations and a very strong positive correlation between crude oil prices and both gasoline and diesel prices. The findings indicate that the Czech fuel market is highly sensitive to global economic and geopolitical events. The research is limited by the monthly frequency of data, the linear nature of the correlation analysis and the absence of additional economic variables, creating opportunities for future studies using more advanced econometric models.

**Keywords:** Crude oil price, gasoline, diesel, correlation analysis, price development, fuel market

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## Introduction

With the continuous development of the economy, people are paying more and more attention to the quality of the commodities they use in their daily lives. Commodities are a fundamental pillar of the economy, as they affect not only production and trade, but also consumer prices and the overall standard of living of the population. Their importance in the modern world is also growing in connection with technological development, population growth, and increasing demand for resources (Zheng, 2022). Commodity markets play a vital role in the global economy, as their prices provide valuable information about current and future economic activity. Commodity price developments reflect supply and demand factors that are sensitive to economic cycles, while also allowing temporary supply shocks to be distinguished from longer-term trends in the economy. This makes commodity markets not only an

investment platform, but also an indicator of the state of the global economy (Matsumoto, Pescatori, and Wang, 2023). Beyond pure price transmission, fuel and energy costs also shape logistics performance and environmental impacts. Kovač et al. (2023) proposed a point-to-point meal delivery system based on the center-of-gravity location method and demonstrated that operational reconfiguration can reduce vehicle kilometers, fuel costs and $CO_2$ emissions (by more than 12%), highlighting the practical relevance of fuel-price sensitivity for transport-intensive services.

The COVID-19 pandemic has caused significant fluctuations in commodity prices and revealed their high sensitivity to global risks. There are varying levels of coherence between the panic index and price movements, pointing to a variable relationship between uncertainty and market volatility (Umar, Gubareva, and Teplova, 2021). In times of crisis, commodities often become a sensitive indicator of economic imbalance. As commodity supplies are a fundamental component of the modern economy, price fluctuations have a direct impact on macroeconomic stability, manufacturing activity, and living standards (Zhang et al., 2022). Countries rich in natural resources are key commodity exporters, but excessive specialization can slow their institutional and economic development (Lana Pinto, Costa, and De Mattos, 2025). Furthermore, since 2009, commodity markets have undergone extensive financial globalization, accompanied by an influx of institutional investment. This financial globalization has enabled broader investor participation, but has also increased the vulnerability of markets to the transmission of volatility and price shocks (Shamsher, 2021).

The prices of oil, gasoline, diesel, and other commodities fluctuated significantly not only during the pandemic but also as a result of the war in Ukraine (Shen et al., 2022). Janek et al. (2024) provide additional evidence of crisis-driven commodity volatility by mapping the price development of gold and silver in 2015–2023 and evaluating the effect of the COVID-19 period. Their findings show a strong co-movement of both commodities and confirm statistically significant predictive relationships using correlation analysis and Granger causality. This conflict disrupted supply chains and had serious implications for regional and global security, leading to significant volatility in the prices of oil and other commodities (Arora, Jayal, and Prakash, 2024). Commodities therefore remain not only an investment opportunity for portfolio diversification, but also a key indicator of global economic stability. Their prices are influenced by weather changes, geopolitical events, seasonality, and demand on global markets, with volatility being one of the main risks of investing in this sector (Soni, Shyamsuder, and Prasad, 2023).

The aim of this thesis is to evaluate the development of gasoline and diesel prices in the Czech Republic in the period 2014-2024 and to determine how strongly these fuels are price-dependent on the development of oil prices.

In connection with this aim, the following research questions are set:

The prices of selected commodities have a significant impact on the economy and the standard of living of the population. This research question allows for a better understanding of

the development of these commodities over a longer period of time and an assessment of the main trends in their prices over the last seven years.

RQ1: How did the prices of oil, gasoline, and diesel develop in the Czech Republic between 2018 and 2024?

Answering the following research question will determine whether there is a statistically significant correlation between the price of oil and the price of gasoline.

RQ2: Is there a statistically significant correlation between the price of oil and the price of gasoline in the Czech Republic?

Answering the third research question will verify whether there is a statistically significant correlation between the price of oil and the price of diesel fuel.

RQ3: Is there a statistically significant correlation between the price of oil and the price of diesel in the Czech Republic?

## Literary research

Fuels for cars and raw materials for the chemical industry have traditionally been produced by refining crude oil. Over time, however, they have also begun to be produced synthetically from other carbon-based raw materials, such as coal or biomass, which has expanded the possibilities for obtaining fuels (Hazra and Elias, 2024).

Mutascu et al. (2022) examined the joint development of gasoline and diesel prices in three European countries, namely Germany, France, and Italy. These countries had different fuel tax systems. Methodologically, they relied on a time-frequency approach, which allowed them to analyze joint developments at different frequencies and time periods. The results of the wavelet coherence analysis showed that there was a long-term relationship between gasoline and diesel prices in all three countries, regardless of their different tax systems. Partial wavelet analysis further confirmed the presence of common developments in the short term, with this phenomenon being more pronounced during the global financial crisis of 2008–2009. They concluded that fuel taxation systems did not have a significant impact on common price developments, while the international price of oil remained the key factor.

Magazzino et al. (2024) focused on the asymmetric transmission of oil prices to retail gasoline and diesel prices in the US market. They found that retail gasoline prices responded more quickly to increases in oil prices than to decreases, which corresponded to the well-known "rockets and feathers" phenomenon. This effect was explained by the theory of oligopolistic coordination, production adjustment and inventory costs, or search theory. They used an approach based on the adjustment cost function in a linear exponential form, which allowed them to derive an econometric specification of the reaction function of gasoline and diesel prices. The estimates confirmed the presence of an asymmetric effect, with the average weekly distortion of retail prices in the US amounting to approximately 0.15 cents per liter of gasoline

and 0.1 cents per liter of diesel. Similar research was conducted by Barbosa et al. (2024), who focused on the Brazilian market. Their goal was to determine whether there were asymmetries in the transmission of West Texas Intermediate (WTI) oil prices to its derivatives, specifically diesel and gasoline. In the first phase, they analyzed oil price time series using nonlinear self-exciting autoregressive (SETAR) models and smooth transition logistic autoregressive (LSTAR) models. They then used a threshold error correction model (TAR-ECM) and a Markov switching model. The findings showed that oil prices were transmitted in the long term, indicating an equilibrium adjustment of fuel prices. In the short term, changes in current oil prices had a positive impact on fuel prices, which was partly due to the internal structure of the pricing policy adopted during the period under review. Bakhat, Rosselló, and Sansó (2022) also made a significant contribution to the discussion on asymmetric price transmission between oil and fuels. They analyzed the "rockets and feathers" phenomenon using a nonlinear autoregressive distributed lag (NARDL) model and proposed a new metric for quantifying the average lag in responses to positive and negative price shocks. The research included weekly data from 2009–2020 for twelve OECD countries. The results confirmed the existence of asymmetries in both the speed and extent of price transmission, underscoring the importance of monitoring not only the impact but also the time lag in the response to changes in oil prices.

Alina and Nožička (2025) focused on the Czech market, examining the long-term relationships between the prices of Natural 95 gasoline, Brent crude oil, diesel fuel, and the CZK/USD exchange rate in 2014–2024. Using the Engle-Granger cointegration test, they found no consistent evidence of cointegration between the variables, suggesting that economic factors such as oil prices and the exchange rate did not significantly affect N95 gasoline prices in the long term.

Khan et al. (2022) focused on analyzing the asymmetric multifractality of energy prices during the COVID-19 pandemic. Using the detrended fluctuation method, they found that asymmetric multifractality was more pronounced during the pandemic, suggesting increased market inefficiency. Strong multifractality was observed in the downward movements of crude oil, heating oil, diesel, gasoline, propane, and kerosene, while in coal and natural gas, it prevailed in the upward movements.

Karimu, Salia, and Hussain (2021) examined the development of the common market for oil and motor fuels in Sweden using a structural VAR model (SVAR). This approach made it possible to analyze the dynamic relationship between the oil market and the motor fuel market (gasoline and diesel) and to track the impact of shocks in oil demand and refineries. The authors found that gasoline and diesel consumption reacts inversely to positive shocks in oil demand, with fuel prices reacting more strongly than consumption. It was also confirmed that oil prices have an immediate and asymmetric impact on the motor fuel market.

Similarly, Ulanov and Skorobogatko (2022) addressed the issue of petroleum product prices, using econometric time series analysis to assess the impact of the spread of alternative fuel vehicles on fuel prices in northwestern Europe. Based on structural shift tests, they found that the development of alternative fuels has a negligible effect on diesel prices but a negative impact on gasoline prices. In addition, the authors confirmed that stricter technical standards

fundamentally change model parameters and thus market behavior. Their conclusions differ in part from the results of Kliber, Łęt and Řezáč (2024), who found that higher oil prices can support the development of alternative transport if they are driven by growth in demand. Thus, the impact of alternative fuels on the market may vary depending on whether fundamental or speculative factors prevail.

Marabucci (2023) focused on Italy and used Bayesian VAR models (BVAR) to quantify the elasticity of demand for automotive fuels (gasoline, diesel, LPG). He worked with monthly time series of consumption and prices since 2002, supplemented by variables such as oil prices and exchange rates. The analysis showed that demand for these commodities is inelastic and that Brent crude oil price shocks are significantly reflected in domestic fuel prices. The results confirmed that the fuel market is highly stable but also highly dependent on global oil price developments.

In the Polish market, Przekota and Szczepańska-Przekota (2025) performed a correlation analysis, Granger causality test, and impulse response function calculation to describe the transmission of oil prices to wholesale and retail diesel prices in 2010–2024. The research showed that oil prices are the cause of changes in both wholesale and retail prices, but there is bidirectional causality between these two market levels. They also found that impulses pass more frequently from retail to wholesale prices, suggesting possible market concentration and the need for state regulation.

Miranda, Campos, and Freire (2023) examined the relationship between the ICMS excise tax, inflation, and fuel prices in Brazil. They first conducted a content analysis of state laws to identify the amount and changes in ICMS rates across states and then used Pearson's correlation to quantify the relationship between tax revenues, Brent crude oil prices, and Type A gasoline prices. The data were processed into correlation matrices broken down by year. The results showed that the correlation was weak in 2018–2020, but in 2021 there was a significant strengthening of the relationship between tax revenues and inflation, demonstrating that fiscal factors can significantly influence both the price level and the fuel market.

The methods outlined above suggest that quantitative content analysis would be most appropriate for this work, as it would allow us to obtain the necessary data on the development of individual commodities. Subsequently, research will be conducted using correlation analysis (Pearson's correlation coefficient) with a heat map. The results will be graphically processed and used to analyze the development of fuel prices, such as diesel and gasoline, and their dependence on the price of crude oil.

## Data and methods

Secondary quantitative data will be used in the research. Data for the first research question will be drawn from the Kurzy.cz website. (Kurzy, 2025). The development of prices of individual fuels, gasoline (Natural 95) and diesel, as well as the price of Brent crude oil, will be monitored in the period from January 1, 2018, to December 31, 2024. The values will be monitored at the beginning of each month and recorded in an MS Excel table. All prices of

gasoline (Natural 95) and diesel will be given in CZK/l, and the price of Brent crude oil will also be given in CZK/l. The data obtained will be clearly arranged in a table and then projected into a graph. The information collected will be further used in addressing the second and third research questions.

To verify the existence of a linear relationship between the variables under study, a correlation analysis will be performed using Pearson's correlation coefficient. This statistical indicator determines the strength and direction of the linear dependence between two variables. The calculations will be performed with a significance level of α = 0.05 (5%). The Pearson correlation coefficient will be calculated based on the following relationship (Wang et al., 2021):

$$r = \frac{\sum(X_i - \bar{X}) \cdot (Y_i - \bar{Y})}{\sum(X_i - \bar{X})^2 \Sigma(Y_i - \bar{Y})^2}$$

where:

- x value of variable $X$
- $\bar{x}$ average value of variable X
- y value of variable Y
- $\bar{y}$ average value of variable Y
- α significance level [5%]

The value of r ranges from -1 to 1.

- Values between 0 and 1 indicate a positive correlation, meaning that both variables change in the same direction. The closer the resulting value is to 1, the stronger the positive correlation
- Values between 0 and -1 express a negative correlation, meaning that both variables change in opposite directions. The closer the resulting value is to -1, the stronger the negative correlation.

Correlation weights determine the strength of the correlation between unknowns:

- 0: No correlation. The values of one variable do not change with the values of the other variable.
- 0.3: Weak correlation. There is only a small connection between the variables.
- 0.5: Moderate correlation. The connection between the variables is more noticeable.
- 0.5 - 0.7: Moderate correlation. There is a relatively strong relationship between the variables.
- 0.7 - 0.9: Strong correlation. The values of one variable change significantly with the values of the other variable.
- 0.9 - 1: Very strong correlation. There is an almost perfect linear relationship between the variables.

To verify or refute the existence of a relationship between individual commodities, the following hypotheses will be formulated:

$H_{0a}$: There is no correlation between the price of oil and the price of gasoline.

$H_{1a}$: There is a correlation between the price of oil and the price of gasoline.

$H_{0b}$: There is no correlation between the price of oil and the price of diesel fuel.

$H_{1b}$: There is a correlation between the price of oil and the price of diesel.

It can be assumed that there will be a strong positive correlation between the price of Brent crude oil and the prices of gasoline and diesel.

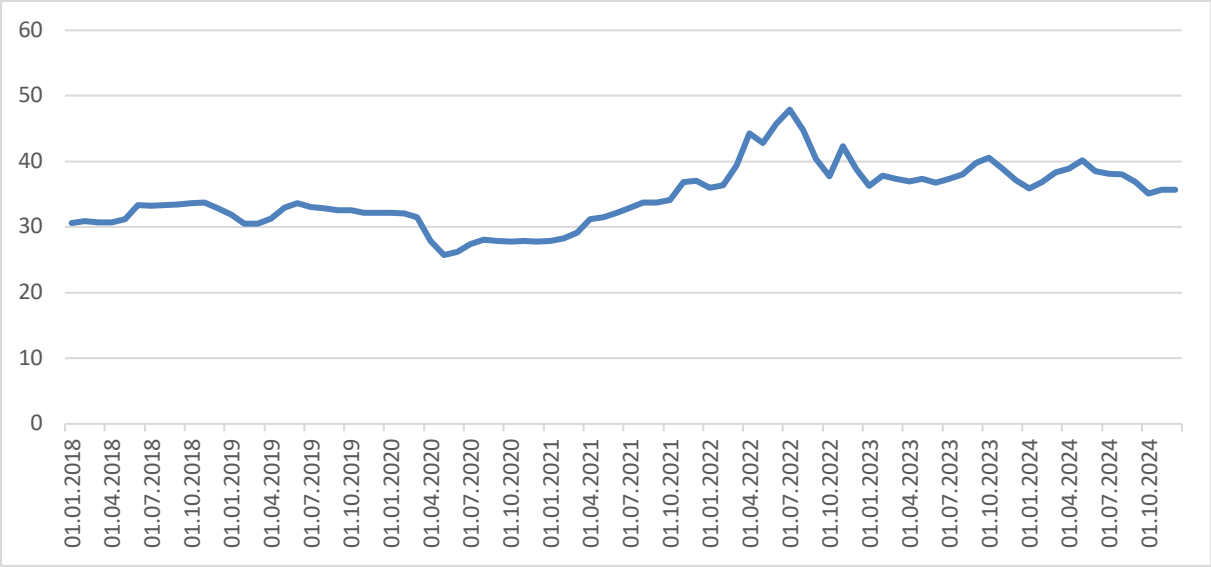
The results of the correlation analysis will be presented in a clear table and then visualized using a heat map, which allows for a graphical representation of the strength and direction of the linear relationship between the variables under observation. The heat map will be created in Python based on a correlation matrix calculated from data in MS Excel. The correlation matrix will contain all mutual combinations of the monitored variables (crude oil, gasoline, diesel). A single common heat map will be generated from this matrix, which will color-code the intensity of the correlation between the individual variables; the higher the correlation value, the richer the color shade. Visual differentiation will be achieved using a color scale, where red shades indicate a strong positive correlation, blue shades indicate a negative correlation, and lighter colors indicate weak or insignificant relationships.

## Results

Between January 1, 2018, and December 31, 2024, there were significant fluctuations in the prices of gasoline, diesel, and Brent crude oil.

Price trends for selected commodities during the period under review are presented below. To obtain the data and enter them into Excel, the following graphs were created to answer the first question:

Figure 1: Gasoline price trends




Source: Own processing based on data from Kurzy.cz

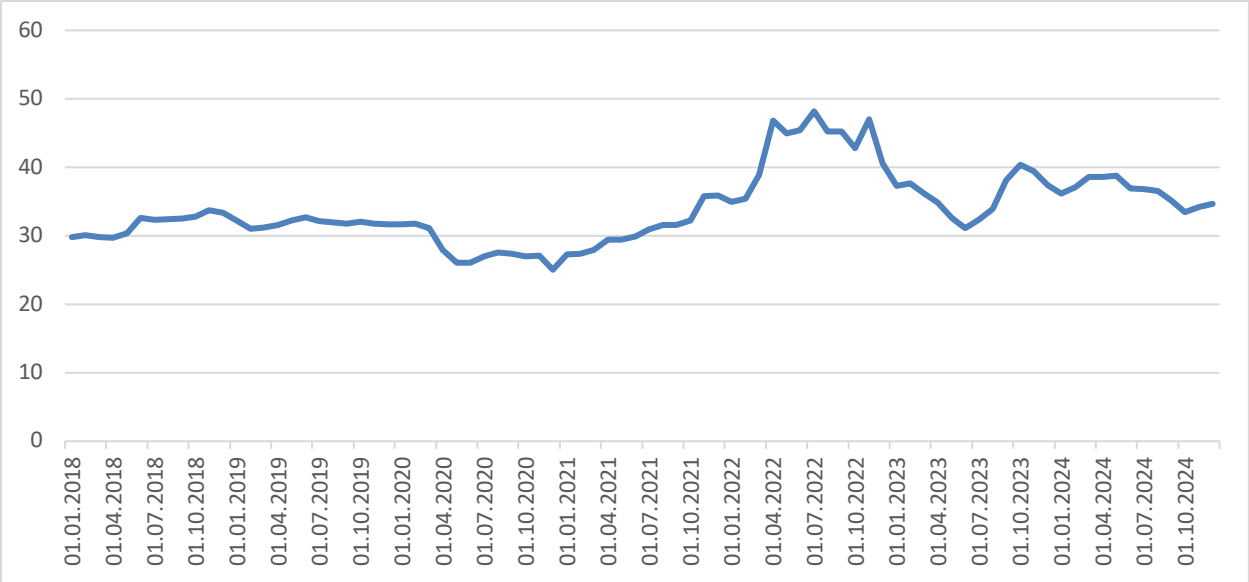
At the beginning of 2018, the price was CZK 30.61/l, which gradually rose to CZK 33.38/l in June. The end of 2018 brought values between CZK 32.90/l and CZK 33.74/l. In February 2019, the price fell to CZK 30.54/l, fluctuating between CZK 30.48/l and CZK 33.64/l during the year, reaching CZK 32.16/l in December.

The decline in 2020 peaked in May, when the price fell to CZK 25.74/l. In the following months, the price fluctuated between CZK 25.74/l and CZK 27.74/l. The decline in 2020 peaked in May, when the price fell to CZK 25.74/l. In the following months, the price fluctuated between CZK 25.74/l and CZK 27.92/l.

Prices rose again in 2021, reaching CZK 32.16/l in June and continuing to rise to CZK 37.03/l in December. The increase continued in 2022, when the price reached its highest value in the entire period under review in July, specifically CZK 47.91/l. In the following months, the price fell slightly to CZK 38.86/l in December.

In 2023, the price ranged between CZK 36.25/l and CZK 40.53/l, reaching CZK 37.19/l in December. In 2024, the price stabilized at CZK 35.66/l at the end of December, with minor fluctuations throughout the year (see Figure 1).

Figure 2: Oil price trends




Source: Own processing based on data from Kurzy.cz.

Figure 2 shows the development of the price of diesel fuel. At the beginning of 2018, the price was CZK 29.84/l. During 2018, the price gradually increased, reaching CZK 32.57/l in June 2018 and CZK 33.72/l in November 2018. At the end of 2018, the price was CZK 33.36/l. In January 2019, the price fell to CZK 32.23/l, and during the year it fluctuated between CZK 31.20/l and CZK 32.73/l.

In December 2019, the price was CZK 31.71/l. In 2020, there was a decline, with the price falling to CZK 26.02/l in April 2020, which was the lowest value in the entire period under review. In the following months, the price fluctuated between CZK 25.04/l and CZK 27.92/l. Prices rose in 2021. In June, the price reached CZK 29.92/l and continued to rise to CZK 35.90/l in December.

The increase continued in 2022, when in July 2022 the price rose to CZK 48.17/l, which was the highest value for the entire period. In December 2022, the price fell to CZK 40.60/liter. In 2023, the price of diesel fluctuated between CZK 32.59/liter and CZK 40.53/liter, ending the

year at CZK 37.39/liter. In 2024, the price of diesel reached CZK 34.70/l at the end of December, with minor fluctuations during the year.

Figure 3: Development of oil prices


Source: Own processing based on data from Kurzy.cz.

Figure 3 shows the development of the price of Brent crude oil. At the beginning of 2018, the price was CZK 8.85/l and rose during the year. In May 2018, it reached CZK 10.42/l, and in October 2018, it rose to CZK 11.94/l, which was the highest price that year. At the end of the year, the price fell to CZK 8.80/l. In January 2019, the price fell to CZK 7.84/l and fluctuated between CZK 7.84/l and CZK 9.98/l during the year. In December 2019, the price was CZK 8.84/l.

The year 2020 brought a significant decline, with the price reaching a low of CZK 5.01/l in April 2020. In the following months, the price rose to CZK 5.86/l in June and then fluctuated between CZK 5.73/l and CZK 6.67/l. In the first half of 2021, the price rose to CZK 9.35/l in June and continued to CZK 11.68/l in December.

In 2022, the price of Brent crude oil rose significantly, reaching CZK 17.06/l in June 2022. The price then fell to CZK 14.45/l in September 2022 and was CZK 12.46/l in December 2022. In the first quarter of 2023, the price ranged between CZK 10.15/l and CZK 13.41/l. In December 2023, the price fell to CZK 11.15/l. At the end of December 2024, the price of oil reached CZK 10.88/l, with minor fluctuations throughout the year.

The following tables were created to answer the second and third research questions:

Table 1: Calculation of the correlation between oil and gasoline prices

| | *Crude oil* | *Gasoline* |
|---|---|---|
| Crude oil | 1 | |
| Gasoline | 0,93865101 | 1 |

Source: Own data processing.

Table 1 shows the calculation of the correlation between oil and gasoline prices in the period under review. The correlation coefficient between these two commodities is 0.93865101, which corresponds to approximately 94%. This is a very strong positive correlation. Since this value is higher than the 5% significance level, we reject the null hypothesis H0a and accept the alternative hypothesis H1a.

Table 2: Calculation of the correlation between oil and gasoline prices

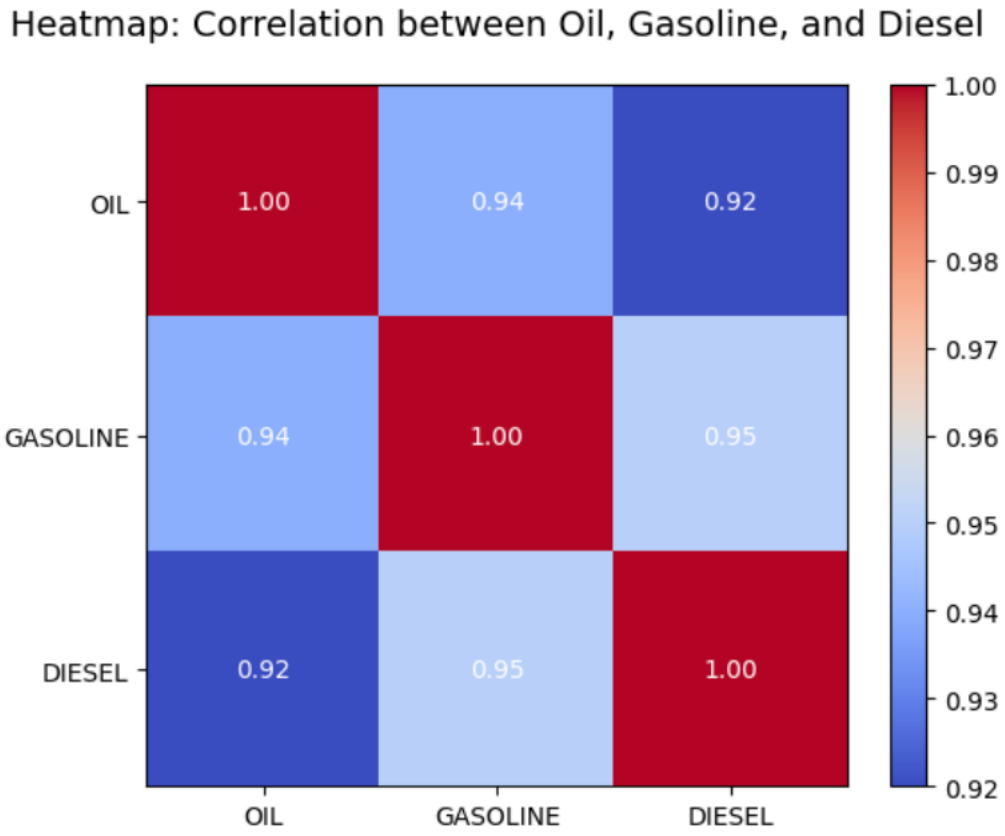
| | *Crude oil* | *Diesel fuel* |
|---|---|---|
| *Crude oil* | 1 | |
| Diesel fuel | 0,92287639 | 1 |

Source: Own data processing.

Table 2 shows that the correlation coefficient between oil and diesel prices is 0.92287639, which is approximately 92% and higher than the 5% significance level. This result indicates a strong positive correlation between these values. This is a very strong positive correlation. Based on these results, we reject the null hypothesis H0b and accept the alternative hypothesis H1b.

Based on the correlation performed, a heat map was created in Python.

Figure 4: Heat map in Python




Source: Own processing.

Based on the heat map, it is clear that the high correlation coefficients between crude oil, gasoline, and diesel indicate a strong interdependence between these commodities. The correlation coefficient between crude oil and gasoline is 0.94, which indicates a very strong positive correlation. This value, shown in the dark red area, indicates that gasoline and crude oil prices move in a similar direction; when the price of crude oil rises, the price of gasoline also rises, and vice versa. Similarly, the correlation between oil and diesel, which is 0.92, indicates a strong positive correlation, meaning that the price of diesel is also strongly influenced by the price of oil. This correlation is slightly lower than for gasoline but still very strong (see Figure 1).

## Discussion of results

*RQ1: How did the prices of oil, gasoline, and diesel fuel develop in the Czech Republic between 2018 and 2024?*

The results showed that the prices of all three commodities underwent significant fluctuations between 2018 and 2024, with the trends monitored showing similar characteristics: a stable period until 2019, a sharp drop in prices in 2020 due to the COVID-19 pandemic, and a subsequent significant increase in 2021 and especially 2022. All three commodities reached

their highest values in 2022, when both gasoline and diesel prices and the price of Brent crude oil peaked. This development confirms the high sensitivity of commodity markets to global shocks, as reported, for example, by Umar, Gubareva, and Teplova (2021), who described the strong reaction of energy prices to uncertainty during the pandemic. This development suggests that the Czech fuel market is sensitive to international price shocks in the period under review, confirming its close links with the global oil market.

The observed development is also in line with the conclusions of Shen et al. (2022), who report that the war in Ukraine disrupted supply chains and caused extreme fluctuations in oil and fuel prices. Similarly,

Zhang et al. (2022) confirm that commodities are highly sensitive to both demand and supply shocks in times of crisis. Our results confirm these findings: the sharp rise in 2022 and the previous decline in 2020 are consistent with what the literature says about global volatility and the macroeconomic sensitivity of commodity markets.

Although the Czech market shows a strong dependence on global oil prices, it is clear that certain domestic factors can influence this sensitivity. For example, in 2022, fuel prices in the Czech Republic were significantly higher than the global average, which may indicate that factors such as distribution costs, domestic supply, or specific policy measures had an impact on the final price. This shows that the Czech fuel market is not merely passive to global trends, but can respond to specific domestic economic factors.

*RQ2: Is there a statistically significant dependence between the price of oil and the price of gasoline in the Czech Republic?*

The correlation between the price of Brent crude oil and the price of Natural 95 gasoline reached a value of $r = 0.94$, which represents a very strong positive relationship. This result reflects the fact that retail gasoline prices closely follow the development of oil prices. This finding is also supported by the conclusions of Magazzino et al. (2024), who confirmed that gasoline prices respond quickly and significantly to changes in oil prices. Their research also showed the existence of asymmetry in the transmission of prices, i.e., a faster response to increases than to decreases in oil prices.

Similarly, Barbosa et al. (2024) demonstrated that fuel prices, especially gasoline prices, respond significantly to both short-term and long-term changes in oil prices. Although this work did not examine asymmetric transmission or nonlinear relationships, the correlation coefficient in this study clearly indicates that gasoline prices are directly linked to oil price developments, which is consistent with most of the literature.

The conclusions of this work contrast with the results of Alina and Nožička (2025), who found no long-term cointegration between fuel and oil prices in the Czech Republic. However, their study uses a different time period and methodology (Engle-Granger test), which may lead to a different assessment of the long-term relationship. Nevertheless, the correlation found in

this study confirms that in the short and medium term, gasoline prices significantly mirror oil price developments.

*RQ3: Is there a statistically significant dependence between the price of oil and the price of diesel in the Czech Republic?*

The results showed a very strong positive correlation between the price of oil and the price of diesel ($r = 0.92$). This relationship confirms that the development of diesel prices is closely linked to the development of oil prices, which is in line with the conclusions of Karim, Sali, and Hussain (2021), who demonstrated the immediate and significant impact of oil price shocks on the motor fuel market, including diesel.

The findings of this study are further supported by the results of Przekota and Szczepańska-Przekota (2025), who identified a strong transmission link between the price of crude oil and diesel prices on the Polish market. Their analysis even showed bidirectional relationships between retail and wholesale prices, suggesting a certain pricing structure within the fuel market. The results obtained here are thus consistent with what international studies on diesel price developments report, namely that the price of diesel is strongly influenced by the price of crude oil.

Differences can only be found in studies that emphasize the role of tax policy or specific market conditions. For example, Miranda, Campos, and Freire (2023) found that fiscal policy can also play a significant role in pricing in Brazil. In the Czech environment, however, the strong correlation found shows that the price of Brent crude oil remains the key factor.

## Conclusion

The aim of this study was to evaluate the development of gasoline and diesel prices in the Czech Republic in the period 2014-2024 and to determine how strongly these fuels are price-dependent on the development of oil prices. For this purpose, quantitative content analysis of secondary data, correlation analysis using Pearson's correlation coefficient, and visualization analysis in the form of a correlation heat map were used. The results obtained using these methods made it possible to answer all the research questions and identify the key factors that influenced price developments during the period under review.

The analysis showed that oil, gasoline, and diesel prices fluctuated significantly between 2018 and 2024, closely linked to global events. The year 2020 was characterized by a sharp drop in prices caused by the COVID-19 pandemic, which led to a significant reduction in mobility and a decrease in energy demand. In contrast, 2022 saw an extraordinary increase in fuel prices, linked in particular to the disruption of world markets as a result of the war in Ukraine. The results thus confirmed that the Czech fuel market is strongly influenced by international economic and geopolitical factors and that domestic prices reflect global price trends.

Correlation analysis also showed a very strong positive relationship between the price of Brent crude oil and the price of gasoline ($r = 0.94$) and diesel ($r = 0.92$). Both null hypotheses about the absence of a relationship were rejected, which means that in the period under review, the price of oil was a key determinant of fuel price developments in the Czech Republic. These results are consistent with the findings in the professional literature and confirm that the price of oil is the main factor shaping the price level of gasoline and diesel on the Czech market.

Based on these findings, it can be concluded that the objective of the study has been achieved. The main price trends in the period under review have been described and the existence of a strong price link between oil and fuel has been confirmed. The study thus provides a comprehensive overview of the development of gasoline and diesel prices and at the same time highlights the high degree of dependence of the Czech market on global oil markets. These findings may be useful for consumers, businesses, and economic policymakers in assessing future fuel price developments.

However, the research had several limitations that need to be taken into account when interpreting the results. The analysis used monthly data, which made it possible to track longer-term trends but did not capture short-term price shocks and intra-month volatility. Furthermore, Pearson's correlation coefficient only captures linear relationships, and therefore any non-linear or asymmetric price reactions that may occur in fuel markets were not identified. Other important variables that may affect final fuel prices, such as exchange rates, inflation, tax policy, or distribution margins, were not included in the analysis. For this reason, the results primarily reflect the basic price link between oil and fuel, rather than the complex structure of price formation.

The study also did not examine the long-term equilibrium between the prices of individual commodities using more advanced econometric models. The results therefore relate primarily to short- and medium-term relationships, rather than long-term price developments. Although these limitations may affect the detail of the interpretation to some extent, they do not preclude the conclusion that the price of Brent crude oil had a significant impact on the development of gasoline and diesel prices in the Czech Republic during the period under review.

In the future, it would be appropriate to focus on the analysis of short-term price shocks and their impact on the Czech fuel market. It would also be interesting to include factors such as exchange rates, inflation, tax policy, and distribution margins, which can also affect fuel prices. The use of advanced econometric models could provide a more detailed analysis of the long-term equilibrium between the prices of individual commodities.

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