An empirical analysis of inflation's influence on income inequality in Lithuania

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Abstract: Income inequality is a growing problem worldwide, especially in developed countries, with adverse social, economic, political and health consequences. In 2017, the goal of reducing poverty and inequality was included in the United Nations' seventeen Sustainable Development Goals list. Despite this, governments are not paying enough attention to tackling the problem, and inequality continues to rise. To take appropriate measures to reduce income inequality, it is essential first to understand the underlying causes, as this can help to tackle the problem at its root. Many different factors have been identified as impacting income inequality, one of which is inflation. Inflation is currently at an all-time high in the country, reaching as high as 19.7% in 2022. This makes it particularly difficult for low-income earners to make ends meet, as buying necessities is becoming harder and harder. Given that rising inflation, due to geopolitical factors, is also an issue in Lithuania and throughout Europe, it is essential to analyse the relationship between income

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inequality, as this can help us make the right decisions in tackling both problems. This study aims to identify the impact of inflation on income inequality in Lithuania. The research methods used to achieve the objective were graphical analysis, literature analysis, correlation analysis and regression analysis. The study shows a linear relationship between the Gini coefficient and inflation, as measured by the change in the GDP deflator, in Lithuania over 2008-2021, but that the impact of inflation on inequality is observed after one year. Similarly, a parabolic relationship is found when examining the impact of a change in inflation, as measured by the change in the GICP, on income inequality. However, changes in producer prices significantly impact income inequality only after three years. An analysis of the impact of changes in the prices of different commodities on income inequality reveals that, over the period analysed, the main contributors to inequality have been increases in the prices of oil, gas, food, and non-alcoholic beverages. Inflation directly impacts income inequality in Lithuania, so policymakers should consider it when formulating social policy.

Keywords: income inequality, inflation, GDP deflator, Gini coefficient

1. Introduction

Income inequality is a growing problem worldwide, especially in developed countries, with adverse social, economic, political and health consequences. The main factors influencing income inequality are economic, demographic, political, cultural, environmental and macroeconomic factors (Kaasa, 2005). The actual effect of a factor influencing income inequality is often complex to determine because the factors are intertwined, i.e., a factor may simultaneously influence both income inequality and another factor of income inequality, and research and efforts to include as many factors influencing income inequality as possible in the model are constantly confronted with the problem of correlation between factors.

Income inequality has many negative consequences, such as reduced consumption and difficulties affording housing. Income inequality is also associated with poorer public health, as a lack of income leads to insecurity and stress and makes it harder to buy quality food and access quality health services. This also leads to increased consumption of alcohol and other harmful substances and mortality (Polacko, 2021).

Countries with high-income inequality also have higher rates of violent crime. When income equality is higher, the rich are less likely to exploit those on lower incomes, commit fraud or behave in socially irresponsible ways because they feel safer and see opportunities to earn an honest living. Countries with income equality also have lower homicide rates. According to Daly (2016), income inequality is the best predictor of homicide rates and explains about half of the difference in homicide rates between countries. As income inequality increases, the social mobility of individuals decreases. According to Polack (2021), the main reason is that high-income inequality increases the gap between the ability of rich and poor parents to invest in their children's education. Growing income inequality has a negative impact on the psychological and physical health of the population. Countries with the highest income inequality have, on average, four years longer life expectancy than those with the highest income inequality. Also, countries with low-income equality have higher levels of stress, anxiety and depression as people think more about their place in the income hierarchy.

The literature also suggests that income inequality has a negative impact on economic growth. According to the Organization for Economic Co-operation and Development, the widening gap between low-income earners and the rest of the population slows economic growth (OECD, 2010). According to Stiglitz (2013), rising income inequality reduces consumption, as high-income earners

spend around 15-25% of their income on saving, while lower-income earners tend to spend everything on consumption. Rising inequality, therefore, reduces demand and slows economic growth. According to Aiyar & Ebeke (2020), the impact of income inequality on economic growth also depends on equality of opportunity, i.e., income inequality slows down growth the most in countries with the least equality of opportunity. Income inequality encourages emigration, as people leave for better opportunities in other countries. The working-age population often generates the most value for the country.

Understanding the root causes of income inequality is critical to taking suitable measures to reduce it, as it can help to tackle the problem at its root. With high inflation currently a problem in Lithuania and across Europe, this paper analyses the impact of inflation on income inequality. The analysis of the literature shows that there is a positive relationship between inflation and income inequality (Björklund, 1991; Bulir & Gulde, 1995; Romer & Romer, 1999; Easterly & Fischer, 2001; Li & Zou, 2002; Heer & Süssmuth, 2007; Ghossouba & Reed, 2017; Berisha et al., 2020). Inflation increases income inequality, while a country's financial development mitigates this adverse effect. Evidence suggests that promoting financial development would mitigate the adverse effects of inflation on income distribution (Kim & Lin, 2023).

Empirical analysis of income inequality is usually based on the Lorenz curve. The Lorenz curve calculates the Gini coefficient, one of the primary measures of income inequality (Aaberge & Lindgren, 2023).

The existence of income inequality up to a certain level can be a positive phenomenon, as it encourages individuals to work, compete, move forward, and improve and stimulates economic growth and innovation. Nevertheless, income inequality has a few negative economic and societal consequences. This study aims to identify the impact of inflation on income inequality in Lithuania. This paper contributes to existing research and provides new insights into the impact of inflation on income inequality in a country characterised by persistently high-income inequality but volatile inflation.

2. Theoretical background

There is an extensive academic literature on the impact of inflation on income inequality. Berisha et al. (2022), considering the complexity of the interaction between inflation and inequality, investigated whether the impact of inflation on inequality differs between the levels of income inequality in different states in the USA. The results showed that inflation hurts income inequality, amplified when income inequality is higher. However, over the years, higher inflation rates further increase income inequality only when income inequality is relatively low. Balcilar et al. Al. (2018) also conducted a study on the relationship between income inequality and the inflation rate and found that this relationship depends on the inflation rate. A positive relationship only occurs when states exceed a threshold level of inflation. Below this value, the inflation rate reduces income inequality. The results show a non-linear relationship between income inequality and the inflation rate. Monnin (2014) analysed the impact of inflation on income inequality in 10 developed countries to determine the impact of inflation on income inequality. According to the author, before analysing the impact of inflation, it is essential to understand that inflation affects different sources of income in different ways. Therefore, given that each household's sources of income are not the same, inflation also affects the incomes of individual households differently. The author identifies three sources of income and describes the impact of inflation on them:

1. Labor income. Inflation affects labour income differently depending on how a worker's salary is indexed to inflation. Employees may also receive bonuses, often based on the company's performance, and as inflation rises, so do the company's profits.

2. Income from capital. This income provides a hedge against inflation and allows for additional earnings such as dividends or interest. However, high-income earners often use these options due to initial costs and other barriers. This increases income inequality.

3. Income from government. The impact of this income on inflation depends on the national system of indexing benefits to inflation. When government benefits are indexed, it affects lower-income people more, as they have a higher share of their income in benefits.

A study by Monnin (2014) found a U-shaped relationship between inflation and income inequality. When inflation is low, income inequality is high. As inflation rises, income inequality falls, reaches a minimum when inflation is around 13%, and starts to rise again.

Siami-Namini and Hudson (2019) assessed the impact of inflation on income inequality in developing and developed countries. An inverted U-shaped relationship (Kuznets curve) was found

in developing countries, while an inverted U-shaped relationship was found in developed countries, which means that the results are consistent with those of the first study, Monnin (2014). Siami-Namini and Hudson (2019) also point out that, according to the Phillips curve, decreasing inflation inevitably increases the unemployment rate, increasing unemployment increases income inequality.

According to Sieron (2017), while research shows a link between inflation and income inequality, this does not necessarily mean that inflation is the cause of income inequality. Therefore, the author highlighted arguments on how inflation contributes to changes in income distribution:

- ✓ Inflation reduces the purchasing power of social benefits, as their indexation lags the rise in inflation. Low-income earners depend most on social benefits, so inflation increases income inequality.
- ✓ In countries with progressive taxation, some lower-income earners fall into a higher tax bracket when inflation rises. This not only reduces their purchasing power but also increases their taxes. This also increases income inequality.
- ✓ Wealthy people are more likely to invest their money to reduce the depreciation of their money due to inflation. This further widens the gap between rich and poor.
- ✓ Understanding that money supply is unevenly distributed across society (the Cantillon effect) is essential. Any increase in the quantity of money does not reach the whole population equally, so those who are first affected by an increase in the money supply (workers in the financial sector) can spend this money before inflation rises. By contrast, the lowest-income earners are the last to be affected by the increase in money supply when inflation has risen, and their purchasing power is reduced. Thus, firstly, due to the Cantillon effect, the rise in wages of low-income earners lags that of higher-income earners when the money supply increases. Secondly, when money reaches the poorer people, it has already lost its purchasing power.
- ✓ The most common way to increase the economy's money is through lending. Loans are granted to people with a high credit rating, i.e., the wealthy. This means that with the help of loans, the rich can further increase their wealth and income.
- ✓ In addition to the last point, people who have taken out loans benefit even more from the rise in inflation by repaying the loans in depreciated money.
- ✓ When inflation rises, food prices tend to rise faster than the prices of other goods and services. Since lower-income groups spend a higher proportion of their income on food, they are more affected by inflation than those with higher incomes. This leads to a redistribution of income from the poor to the rich.

Thalassinos et al. (2012) analysed the relationship between income inequality and inflation in 13 European countries from 2000 to 2009 using a panel data methodology. The GINI coefficient was used to measure income inequality, and the independent variables were the inflation rate, the growth rate, the employment rate and the openness of the economy. The results show that inflation has a positive significant effect on income inequality.

The literature analysis suggests that inflation affects income inequality through various channels, ranging from the depreciation of social benefits to food prices. Also, a U-shaped relationship between inflation and income inequality is observed in developed countries.

3. Methodology

The study on the impact of inflation on income inequality is carried out in two stages. First, the aim is to establish whether there is a significant relationship between income inequality, as measured by the Gini coefficient, and inflation, as measured by changes in the Consumer Price Index (CPI), the Producer Price Index (PPI) and the GDP deflator, as well as the impact of inflation on income inequality. Inflation measured by different indices is included in the study to determine how measured inflation best reveals its impact on inequality. The second part of the study assesses which changes in the prices of products and commodities or energy over the period analysed have impacted income inequality in Lithuania. All the research described in this chapter uses the EViews 12 SV software.

In order to have a sufficient number of observations, the period 2005-2021 has been chosen. Prior to the correlation and regression analyses, a preliminary analysis of the observations was carried out, i.e., to assess the suitability of the data for further analysis, their stationarity and fit to the normal distribution were assessed, and, where necessary, differencing and/or functional transformation of the data was performed. The stationarity of the data was assessed using the unit root method and the Dickey-Fuller (DF) criterion with a 5% confidence level. The Jarque-Bera (JB) criterion was used to assess the normality of the data, with a critical value of 5.99 at the 5% confidence level. Two hypotheses were used to assess normality:

H0: The distribution of values of the variable follows a normal distribution.

H1: The distribution of values of the variable does not follow a normal distribution.

The null hypothesis was rejected if the resulting JB value was more significant than the critical value of 5.99 and the resulting probability was less than 0.05.

Next, a correlation matrix was constructed to determine whether a significant linear relationship exists between the variables. The Pearson correlation coefficient was used to assess the linear relationship between the quantitative variables, and the relationship's significance was assessed using the t-statistical probability. For this purpose, the following hypotheses were formulated:

H0: The correlation between the variables is not significant.

H1: The correlation between the variables is significant.

The null hypothesis was rejected if the probability of the t-statistic did not exceed the 5% confidence level. Scatter diagrams are also used in the study for the preliminary identification of a possible non-linear relationship. Regression analysis was used to assess the impact of inflation on income inequality. If a significant linear relationship was found in the correlation analysis, linear and non-linear regression models were developed; if there was no linear relationship between the Gini coefficient and inflation, only non-linear regression models were developed. The possible pairwise models and their equations are presented in Table 1.

Table 1: Pairwise regression models and their equations	
Pair models	**Model equation**
Linear regression	$y=c_1+c_2*x$
Hyperbolic regression	$y=c_1+c_2/x$
Polynomial regressions	$y=c_1+c_2*x+c_3*x^2$
Lin-log	$y=c_1+c_2*\ln(x)$
Log-lin	$\ln(y)=c_1+c_2*x$
Log-log	$\ln(y)=c_1+c_2*\ln(x)$

If inflation may affect income inequality over time rather than immediately, the models also incorporate lags of the independent variable. For the most accurate significant models, an elasticity coefficient is calculated.

The second part of the study assesses the impact of income inequality on the prices of specific products and raw materials purchased by consumers and producers. Given the availability of data, it is chosen to assess the impact on income inequality of the two most significant components of the CPI basket of goods, i.e., food and non-alcoholic beverages, and housing, water, electricity, gas and other fuels, as well as the impact on income inequality of the average household prices of gas and electricity. The choice has been made to assess the impact of PPI on income inequality of average electricity and gas prices for non-household consumers, as well as world oil prices and average gross wages.

The series used in the study for the main components of the CPI basket, wages and oil prices, are for 2005-2021, while gas and electricity prices are used only for 2008-2021 due to data availability.

4. Research and discussion

The Gini coefficient is one of the most commonly used measures of income inequality. It varies between zero and one (or 100%): zero indicates perfect income equality, and one (or 100%) indicates absolute inequality (Erdenee et al., 2017). Figure 1 shows the evolution of the Gini coefficient in Lithuania and the European Union countries.

Between 2008 and 2021, the level of income inequality in the EU has evolved only slightly, fluctuating between 30% and 31% over the whole analysis period. The Gini coefficient has been higher throughout the period in Lithuania, with higher volatility. 2010, the Gini coefficient rose to 36.1%, while it was almost 6% lower in the EU. In 2012, the country's Gini coefficient reached its lowest level in the period analysed, at 32%, only 1.6% behind the EU average. Nevertheless, income inequality, as measured by the Gini coefficient, has increased since 2013, reaching 37.9% in 2015. In 2021, inequality will reach 30.1%, 5.3% higher than the EU average.

Figure 1: Dynamics of the Gini coefficient in Lithuania and the European Union 2008-2021
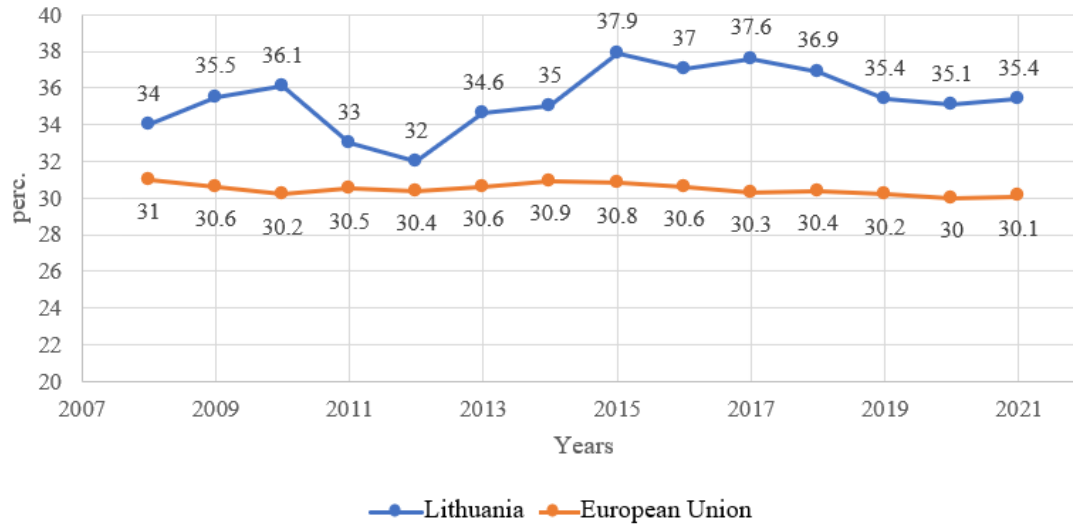
Source: compiled by the authors, based on Eurostat, 2023; State Data Agency of Lithuania, 2023

To better understand the scale of the problem of income inequality in Lithuania, it is also worth looking at where Lithuania ranks in the EU in terms of the Gini coefficient (see Table 2).

Table 2: Lithuania's position in the European Union according to the Gini coefficient 2008-2021

Years	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Lithuania's position in the EU - Gini coefficient	5	2	1	7	9	4	5	1	2	2	2	2	2	3

Source: compiled by the authors, based on (Eurostat, 2023)

Table 2 shows that in 2010 and 2015, Lithuania had the highest Gini coefficient in the EU. This means that income inequality in Lithuania in those years was the highest among all EU countries. As mentioned earlier, it was in these years that the country's Gini coefficient peaked. The lowest Gini coefficient in Lithuania was in 2012, when the Gini coefficient was at its lowest level during the period analysed, at ninth place. This shows that income inequality is a particularly acute problem in Lithuania. Even though inequality has declined since 2017, Lithuania remains in the top three most unequal countries in the European Union.

Inflation is another problem we analyse. Lithuania's leading inflation indicators are the Consumer Price Index (CPI) and the Harmonised Consumer Price Index (HCPI). The latter is calculated to ensure that the methodology for calculating inflation is the same among all European Union countries, thus achieving inflation comparability (State Data Agency, 2023b). Although central banks try to keep inflation under control at around 2%, it inevitably fluctuates. Inflation in Lithuania can be observed in Figure 2.

Figure 2: Average annual inflation in Lithuania 2008-2022
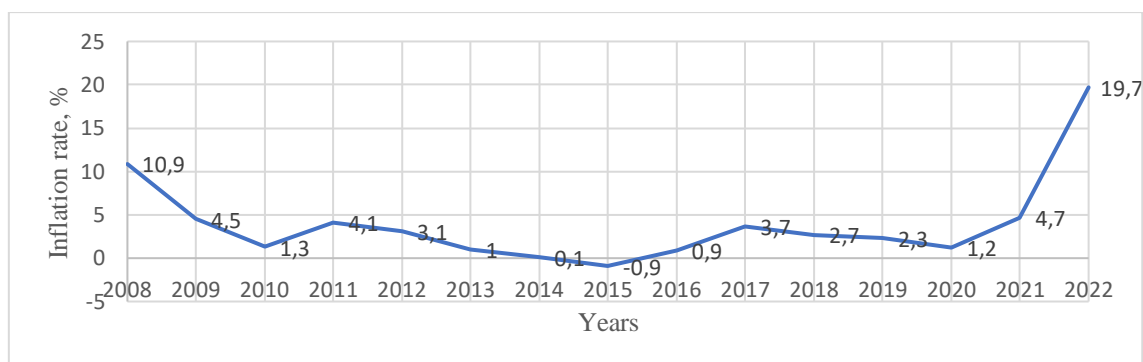
Source: compiled by the authors, based on State Data Agency of Lithuania, 2023a

In 2008, the inflation rate in Lithuania was as high as 10.9%. This was due to the global financial crisis. According to the Bank of Lithuania (2009), raw materials and food prices were rising then, and the country's economic development slowed. Prices of essential consumer goods, such as foodstuffs and thermal energy, rose sharply. However, in 2009, inflation in Lithuania declined to 4.5% due to a renewed decline in raw material prices and a contraction in consumption (Bank of Lithuania, 2010). After the financial crisis, the country's inflation rate remained normal. It rebounded slightly in 2011 when household sentiment improved after the financial crisis, unemployment fell, and wages rose (Bank of Lithuania, 2012), and in 2017, when employment fell again, commodity prices rose (Bank of Lithuania, 2018). According to the Bank of Lithuania (2016), this is related to a significant drop in fuel prices, as oil prices fell by a third in 2015. In addition, global food commodity prices fell by a fifth.

Inflation started to rise again in 2021 when it reached 4.7%. Commodity markets have not matched this growth, so the rising prices of raw materials have impacted consumer goods' prices. In addition to strong demand, rising gas prices are also due to geopolitical factors. In addition, food prices were also pushed up by exceptionally high vegetable prices due to the year's poor harvest. Finally, inflation was also influenced by wages, which rose by 10.5% in 2020, adding to the already high levels of population consumption after the pandemic and increasing producer costs (Bank of Lithuania, 2021). In 2022, inflation rose sharply, increasing by as much as 15% p.p. to 19.7%. The main reasons for this were the increase in the cost of energy and food commodities due to the outbreak of war in Ukraine. Russia's reduction of gas supplies to Europe has led to a fivefold price increase in August 2022. Also, due to rising wages, the population's consumption level remained high (Bank of Lithuania, 2022).

Inflation is currently at an all-time high, reaching 19.7% in 2022. This could make it particularly difficult for low-income earners to make a living, as it becomes harder to buy necessities. Given that we currently face high inflation and income inequality, it is crucial to analyse the interlinkages between these factors.

In order to determine whether there is a relationship between inflation and income inequality and which measure of inflation best reflects this relationship, correlation and regression analyses are carried out on the observations of inflation and income inequality indicators: their stationarity and fit to a normal distribution are assessed, and, where necessary, differencing and/or functional transformation of the data is performed. All the variables analysed were found to be non-stationary, except inflation as measured by the PPI, and were therefore differentiated. The Gini coefficient and the CPI and PPI inflation variables follow a normal distribution, while the GDP deflator inflation variable has been brought closer to a normal distribution by removing the outlier.

In order to see whether there is a linear relationship between the Gini coefficient and inflation, a correlation matrix was constructed (see Table 3).

Table 3: Correlation matrix		
Index	**Correlation**	**Dif. Gini coefficient**
Dif. inflation by GDP deflator	Pearson correlation coefficient	0,08
	Probability	0,78
Dif. inflation by CPI	Pearson correlation coefficient	-0,26
	Probability	0,35
Inflation by PPI	Pearson correlation coefficient	-0,34
	Probability	0,22

Table 3 shows that the linear correlation of inflation calculated from all indices with the Gini coefficient is insignificant, as the probabilities of the t-statistics are above the 0.05 confidence level. Given that no significant linear relationship was found between the Gini coefficient and the above variables, only non-linear pairwise regression models can be constructed for further analysis. Since all variables have negative values, it is only appropriate to construct hyperbolic and polynomial regression models. Therefore, pairwise non-linear regression models are constructed between income inequality measured by the Gini coefficient and the independent variables considered (inflation calculated using CPI, PPI and GDP deflator). The assessment of the significance of the constructed non-linear models and their parameters showed that only 3 non-linear regression models were used.

1) Hyperbolic regression model between GINI and PPI. Gender of this model:

$$GINI = 0,051 - 2,493 / PPI \tag{1}$$

2) Polynomial regression model between diff. Gini coefficient and diff. Inflation is calculated from the GDP deflator, including one lag. The equation of this model:

$$Dif. GINI = 0,213 - 0,478 * dif. GDP\ defl.(-1) \tag{2}$$

This model shows that the change in inflation significantly affects the Gini coefficient after one year.

3) Modified polynomial regression model between diff. Gini coefficient change and inflation were calculated using the PPI with 3 lags. This model is obtained by removing the first parameter as it has the highest probability of the t-statistic. The equation of this model:

$$\Delta GINI = 1,141 - 0,020 * PPI(-3)^2 \tag{3}$$

The model shows that inflation measured using producer prices significantly impacts the change in income inequality only after three years.

Changes in producer prices can be seen to affect inequality later than changes in prices of final goods. As mentioned in the theoretical part, the PPI monitors price changes at earlier stages, showing price increases before they have had time to affect final consumers. The modified polynomial regression model shows that this effect occurs after three years. In contrast, the first linear model shows that the impact on income inequality occurs after one year for final commodity prices.

Calculating the elasticities of these models shows that a one percentage point change in the inflation rate as measured by the GDP deflator leads to a 4.317% change in the Gini coefficient after one year. Similarly, a one percentage point increase in inflation as measured by the PPI leads to a 4.146% change in the Gini coefficient after three years.

The impact of final prices on income inequality is more pronounced, as these prices directly impact consumers' incomes.

As measured by the CPI, inflation does not significantly impact income inequality, which means that the products included in the basket are insufficient to establish a significant relationship but that a relationship is established for all goods produced in the economy.

In order to better understand which changes in the prices of goods and services have the most significant impact on income inequality, this section assesses the impact on income inequality of changes in the prices of the products that make up the largest share of the goods in the basket, as well as the impact of changes in the prices of energy resources. Average wages are also analysed as one of the determinants of supply-side inflation. All variables are presented in Table 4.

Table 4: Variables of the research	
Variable	**Abbreviation**
Gini coefficient	GINI
Housing, water, electricity, gas and other fuels	HWEGF
Food and non-alcoholic beverages	FNAB
Oil price	OP
Average wage	AW
Average electricity prices for non-household customers	AEPNHC
Average natural gas prices for non-household customers	ANGPNHC
Average natural gas prices for household consumers	ANGPHC
Average electricity prices for household consumers	AEPHC

The analysis of the observations showed that all the variables analysed were non-stationary and, therefore, different. The normality assessment showed that all the variables, except for diff. Gas

prices for non-household consumers follow a normal distribution. This variable was brought closer to the normal distribution by a transformation. The correlation analysis (see Table 5) showed that none of the independent variables has a significant linear correlation with the dif. Gini coefficient so that only non-linear regression models can be constructed in regression analysis.

Table 5: Correlation matrix		
Index	**Correlation**	**Dif. Gini coefficient**
Dif. Housing, water, electricity, gas and other fuel price index	Pearson correlation coefficient	-0,339
	Probability	0,257
Dif. Food and non-alcoholic beverages price index	Pearson correlation coefficient	-0,265
	Probability	-0,544
Dif. Oil price	Pearson correlation coefficient	-0,552
	Probability	0,051
Dif. Average wage	Pearson correlation coefficient	-0,183
	Probability	0,568
Dif. Average electricity prices for non-household customers	Pearson correlation coefficient	0,057
	Probability	0,861
Dif. Average natural gas prices for non-household customers	Pearson correlation coefficient	-0,129
	Probability	0,675
Dif. Average natural gas prices for household consumers	Pearson correlation coefficient	-0,142
	Probability	0,642
Dif. electricity prices for household consumers	Pearson correlation coefficient	-0,191
	Probability	0,552

Given that no significant linear relationships are found and that all differenced variables have negative values, two pairwise non-linear regression (PNR) models, a hyperbolic and a polynomial model, are developed to assess the impact of the variables on income inequality. These models between the change in the Gini coefficient and all the independent variables analysed yield only one significant model between the Gini coefficient and the food and non-alcoholic beverage price index:

$$\Delta GINI = 0{,}542 - 0{,}065 * FNAB^2 \qquad (4)$$

The elasticity coefficient of the model shows that a 1%-point increase in the price index for food and non-alcoholic beverages increases the Gini coefficient by 0.23% points.

Under the assumption that price increases may not immediately affect income inequality, hyperbolic and polynomial regression models are tested between the Gini coefficient and all the independent variables analysed, including lags 1, 2 and 3. The following significant models are obtained:

1) A hyperbolic model is obtained between the differentiated Gini coefficient and the differentiated average gas prices for household consumers, including one lag of the independent variable. Model equation:

$$Dif.\ GINI = 0{,}291 + 0{,}045 / dif.\ ANGPHC\ (-1) \qquad (5)$$

The elasticity of this model is 0.0837. This means that a 1% point increase in gas prices leads to a 0.0837% point increase in income inequality, as measured by the Gini coefficient, after one year.

2) A modified polynomial regression (linear) model is obtained between diff. Gini coefficient and diff. Oil prices and removing the second parameter, which had a higher non-significant t-statistic probability. Model equation:

$$Dif.\ GINI = 0{,}187 - 0{,}007 * dif.\ OP(-2) \qquad (6)$$

The elasticity of the model is 1.16, indicating that a 1% point increase in oil prices leads to a 1.16% point increase in income inequality, as measured by the Gini coefficient, with the effect taking effect after two years.

Thus, an assessment of the impact on income inequality of changes in commodity and resource prices for commodities and resources consumed by primary producers and final consumers reveals that changes in oil prices, gas prices for household consumers and the prices of food and non-alcoholic beverages significantly affect income inequality. Increases in the prices of all these commodities contributed to income inequality over the period analysed. Changes in oil prices had the most significant impact on income inequality, according to the estimated elasticities. Changes in food and non-alcoholic beverage prices are also found to have the most significant impact on income

inequality in the current year, while changes in gas prices have the most significant impact one year later, and changes in oil prices have the most significant impact only two years later.

5. Conclusions

An analysis of the relationship between income inequality and inflation in Lithuania suggests that income inequality is a particularly acute problem in the country. Although inequality has declined since 2017, Lithuania remains in the top three most unequal countries in the European Union. Inflation analysis has shown it is at its highest level in the last 15 years, reaching 19.7% in 2022. This could make it particularly difficult for low-income earners to make a living, as buying necessities is increasingly difficult. The leading causes of the changes in inflation in Lithuania over the period analysed are the financial crisis in 2008, as well as fluctuations in the prices of raw materials, heat and food, and wage increases.

Correlation and regression analyses have shown that using the CPI to assess the impact of inflation on income inequality is inappropriate, as it includes too few goods, and the relationship is insignificant. Measuring inflation in terms of the GDP deflator, i.e. taking into account the prices of all goods and services produced in the country, inflation has been found to have a significant impact on income inequality - as inflation rises, income inequality rises - but this effect is only observed after one year. The impact of producer price index inflation on income inequality is also significant, but in this case, the impact is weaker and only observed after three years. An analysis of the most significant effects of commodity prices on income inequality in Lithuania over the period analysed shows that increases in food and non-alcoholic beverage prices are already increasing income inequality in the current year, while increases in gas prices for households are expected to increase in one year and oil prices in two years. This shows that inflation has a direct impact on income inequality in Lithuania.

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Consent for publication

Not applicable.

Availability of data and material

The data are available on request.

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