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FOOD/ENERGY SECURITY AND HOUSEHOLD LIVELIHOODS IN THE WESTERN BALKANS

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FOOD/ENERGY SECURITY AND HOUSEHOLD LIVELIHOODS IN THE WESTERN BALKANS

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1. INTRODUCTION

The impact of energy and food price increases on household livelihoods in the Western Balkans, as in many other regions, can have significant and multifaceted effects. These impacts are influenced by various factors, including the magnitude of price increases, the overall economic conditions in the region, government policies, and individual household circumstances.

The COVID-19 pandemic has had a significant impact on food and energy prices globally. When it comes to food security and prices, the pandemic influenced them differently across the regions. Lockdowns, travel restrictions, and disruptions in transportation and labour availability have affected the production, distribution, and supply of food. This has led to supply chain disruptions and, in some cases, shortages of certain food products, causing prices to fluctuate. Changes in consumer behaviour during the pandemic, such as increased demand for certain staple foods and decreased demand for non-essential items, have influenced food prices. Some countries also implemented export restrictions on food products to ensure domestic food security during the pandemic. These restrictions contributed to price increases in the international food market. The economic repercussions of the pandemic, including job losses and reduced consumer spending, have affected inflation rates for both food and energy products.

The energy market saw extreme volatility, with oil prices briefly turning negative in April 2020. This was due to a combination of factors, including a price war between major oil-producing countries and a sudden drop in global oil demand. The energy sector, like the food sector, experienced supply chain disruptions and delays in the construction of energy infrastructure, affecting energy prices and reliability in some regions. Government responses, economic recovery efforts, and shifts in consumer behaviour have all played roles in shaping the trajectory of these prices. Additionally, regional differences and market conditions have resulted in varying impacts on food and energy prices in different parts of the world.

The abovementioned global challenges influenced individuals and households in the Western Balkan region as well. These specific price shocks caused by the pandemic and the Russia-Ukraine conflict worsened already existing inequalities in the Western Balkan region. Poverty and inequality in the Western Balkan region have been persistent challenges, and the specific dynamics vary among the countries in the region. Income poverty remains a significant issue in the Western Balkans. Many households have incomes that fall below the national poverty line, making it difficult for them to meet basic needs, including food, housing, and healthcare. In some Western Balkan countries, there are notable disparities between rural and urban areas in terms of poverty. Rural areas often have higher poverty rates, limited access to services, and fewer income-generating opportunities. High levels of youth unemployment are a major concern. Young people often struggle to find stable employment, contributing to poverty and emigration from the region. A significant portion of the population is engaged in the informal economy, which can lead to instability and insecurity in terms of income, social protection, and access to services. Income inequality is a prominent issue in the region.

There is often a considerable gap between the rich and the poor, and this gap has persisted or widened in some cases. Unequal access to job opportunities and wage disparities are prevalent in the region. Discrimination and the prevalence of low-paying and precarious jobs contribute to inequality. Rural and marginalised communities often have limited access to basic services like clean water, sanitation, and transportation, which can further perpetuate inequalities.

Although there are evident price spikes and persistent challenges with poverty and inequality in the region, it is important to assess the situation and learn from it to inform future responses and policies. To address these challenges, governments and policymakers in the Western Balkans need to adopt a multi-faceted approach. This may involve implementing targeted social protection programmes, promoting energy efficiency and renewable energy sources, and addressing structural issues in the agricultural sector to stabilise food prices. Additionally, fostering economic growth and job creation can help households cope with rising costs. This study aims to provide an overview of the previous trends in changes in household expenditure patterns, prices of food and energy products, and main poverty and inequality indicators pertaining to providing a regional snapshot before and after the crisis. By analysing the trends and previous responses without establishing a cause-and-effect relationship, the study provides a comprehensive analysis of previous trends to inform future policy decisions. The report will also present the results of a case study analysis of the effects of price changes on household livelihoods in Bosnia and Herzegovina (BiH). This part of a study aims to establish a cause-and-effect relationship with the aim of providing methodology and the possibility to replicate the study in other countries in the Western Balkan region, as well as to provide policy relevant recommendations.

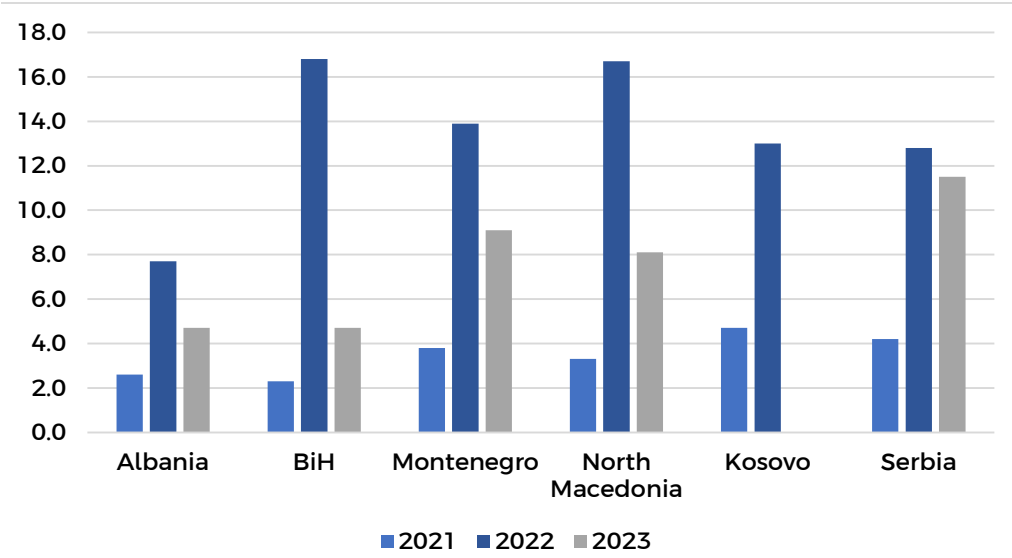
2. REGIONAL OVERVIEW ON FOOD/ ENERGY MARKETS AND HOUSEHOLD LIVELIHOODS IN WESTERN BALKANS ECONOMIES

2.1 CHANGES IN CONSUMER (ENERGY AND FOOD) PRICES IN THE WESTERN BALKAN REGION

In the dynamic landscape of the Western Balkan region, the intricate interplay of economic, political, and environmental factors significantly influences the cost of living for its inhabitants. This section delves into the nuanced realm of consumer prices, specifically focusing on the pivotal sectors of energy and food. Over the past three years, the region has undergone a series of transformations, navigating through both internal and external forces that have left an indelible mark on the economic equilibrium.

Changes in consumer prices are generally influenced by many factors, but high shocks are not often the case. In the period covered by this study, from 2021 to 2023, two shocks were particularly important for consumer prices. These include the pandemic and the Russian-Ukraine war. While the first one was a global phenomenon, the second one mostly affected European countries. Before the COVID-19 pandemic, which began in late 2019 and escalated in 2020, the Western Balkan region generally experienced a period of relatively stable but varied economic conditions. Each country in the region has its own economic dynamics, but some common trends and factors influenced consumer prices in the years leading up to the pandemic.

Figure 1: Change in consumer prices between August 2021, 2022 and 2023, by country



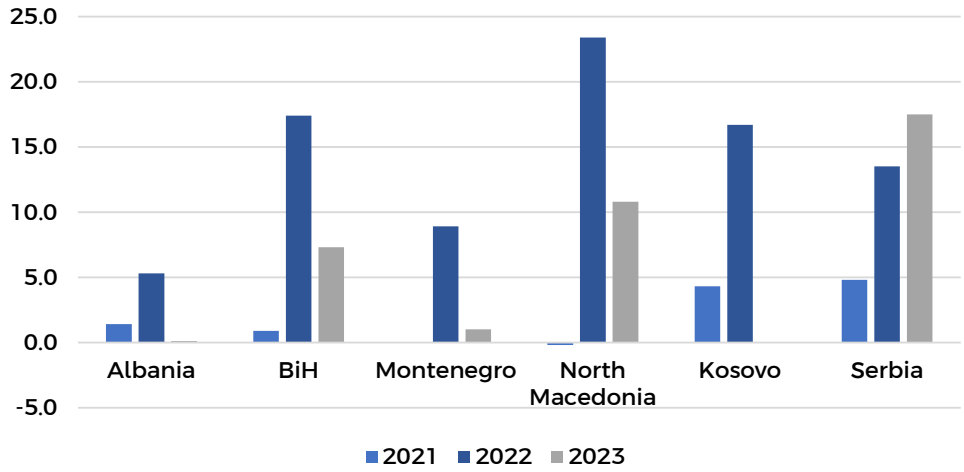
Sources: Eurostat HICP - monthly data; Own calculations for BiH based on Consumer Price Index data from BHAS

Figure 1 presents year-on-year changes in consumer prices that occurred during the period 2021–2023 in Western Balkan economies, as measured by the Harmonised Index of Consumer Prices (HICP)[1]. All countries in the region experienced an increase in annual change of rate in consumer prices in August 2022 compared with the same period in the previous year. The highest increase was recorded in BiH (16.8%), followed by North Macedonia (16.7%), Montenegro (13.9%), Kosovo (13.0%), and Serbia (12.8%). Albania had the smallest annual rate of change in 2022 compared with 2021. While inflationary growth was slowing down in 2023 compared with 2022 throughout the region, the pace of recovery was not the same in each country. While the change in consumer prices was significantly lower in Albania and BiH in 2023 compared with the rate recorded in 2022, rates in Serbia and Montenegro were still high in 2023. This suggests that different factors may influence changes in consumer prices accross countries in the analysed period.

Not all consumer prices experienced the same changes, so it is worth looking into changes for food and energy items separately. In the context of this study, we will first closely observe trends in changes in the prices of energy items, since increases in energy prices may affect many other consumer prices, including food. Figure 2 presents these changes for energy items that are classified under the COICCOP category for electricity, gas, and other fuels.

1 HICP data for BiH is not available, so CPI was used instead of HICP. There are methodological differences in the calculation of two indexes, and comparisons of other economies with BiH data should be made with caution.

Figure 2: Change in consumer prices of electricity, gas and other fuels between August 2021, 2022 and 2023 by country



Sources: Eurostat HICP - monthly data; Own calculations for BiH based on Consumer Price Index data from BHAS

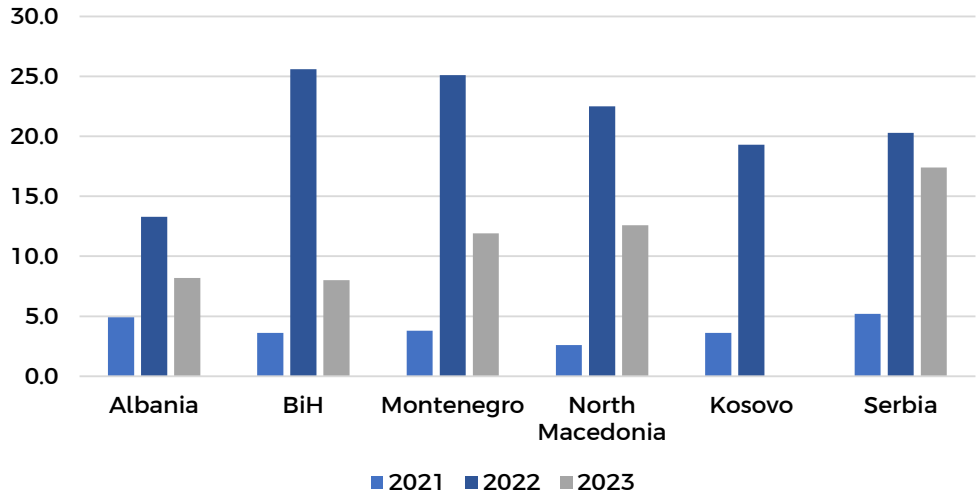
Figure 2 reveals that in 2021, there was a modest increase of 1.4% in consumer prices for electricity, gas, and other fuels in Albania. The rate of change significantly increased in 2022, reaching 5.3%. In 2023, the rate of change decreased to 0.1%. When it comes to BiH, there was a relatively small increase of 0.9% in 2021 compared to 2020. The rate of change sharply increased to 17.4% in 2022, while in 2023, there was a decrease, but the rate of change remained high at 7.3%. There was no change (0.0%) in consumer prices for this category in Montenegro for 2021. The rate of change increased to 8.9% in 2022 and then went back to 1.0% in 2023. There was a slight decrease (-0.2%) in energy prices in North Macedonia in 2021 compared with 2020. The rate of change significantly increased to 23.4% in 2022. In 2023, there was still a positive increase of 10.8%. In Kosovo in 2021, there was a substantial increase of 4.3%. The rate of change further increased in 2022 to 16.7%. In 2021, there was a notable increase of 4.8% in Serbia. The rate of change increased to 13.5% in 2022. In 2023, there was a further increase to 17.5%.

Across most countries, there was an increase in the rate of change in consumer prices for electricity, gas, and other fuels from 2021 to 2022. The highest increase was recorded in North Macedonia (23.4%), followed by Bosnia and Herzegovina (17.4%), Kosovo (16.7%), and Serbia (13.5%). Albania with 5.3% and Montenegro with 8.9% experienced the lowest changes in consumer prices of electricity, gas and other fuels in 2022. In 2023, there was a mix of decreases and increases, suggesting varying trends in the cost of these utilities across the countries.

Serbia was the only country in the region to record an additional increase in consumer prices of electricity, gas, and other fuels in 2023 compared with 2022. While there is a general trend of increased consumer prices from 2021 to 2022, the specific changes in energy prices vary by country. Some experienced significant increases in energy prices, while others had decreases or more moderate changes. These variations highlight the diverse economic conditions and energy market dynamics across the mentioned countries.

The following graph (Figure 3) presents annual changes in prices of food and non-alcoholic beverages using the HICP monthly data[2].

Figure 3: Change in consumer prices of food and non-alcoholic beverages between August 2021, 2022 and 2023 by country



Sources: Eurostat HICP - monthly data; Own calculations for BiH based on Consumer Price Index data from BHAS

As it can be seen from Figure 3 there was a moderate increase of 4.9% in consumer prices for food and non-alcoholic beverages in Albania in 2021. The rate of change significantly increased in 2022 to 13.3%. In 2023, the rate of change decreased to 8.2%. In Bosnia and Herzegovina, there was a relatively lower increase of 3.6% in 2021. The rate of change sharply increased to 25.6% in 2022. In 2023, there was a decrease, but the rate of change remained high at 8.0%. Similar to BiH, there was an increase of 3.8% in consumer prices for this category in Montenegro in 2021. The rate of change further increased in 2022 to 25.1%. In 2023, there was still a positive increase of 11.9%. In 2021, there was a moderate increase of 2.6% in North Macedonia. The rate of change significantly increased in 2022 to 22.5%. In 2023, there was still a positive increase of 12.6%. When it comes to Kosovo, there was an increase of 3.6% in 2021. The rate of change increased in 2022 to 19.3%. In 2021, there was a higher increase of 5.2% in Serbia compared to other countries. The rate of change increased in 2022 to 20.3%. In 2023, there was a decline to 17.4%. Across all countries, there was an increase in the rate of change in consumer prices for food and non-alcoholic beverages from 2021 to 2022. Bosnia and Herzegovina experienced the highest increase of 25.6%, followed by Montenegro (25.1%), North Macedonia (22.5%) and Serbia (20.3%). In 2023, all countries experienced decreases but to different extant, suggesting varying trends in the cost of these essential items across the countries. The most worrying situation is in Serbia, where the pace of increase was not slowing down and an additional increase of 17.4% was recorded in 2023 compared with 2022.

2 HICP data for BiH is not available, so CPI was used instead of HICP. There are methodological differences in the calculation of two indexes, and comparisons of other economies with BiH data should be made with caution.

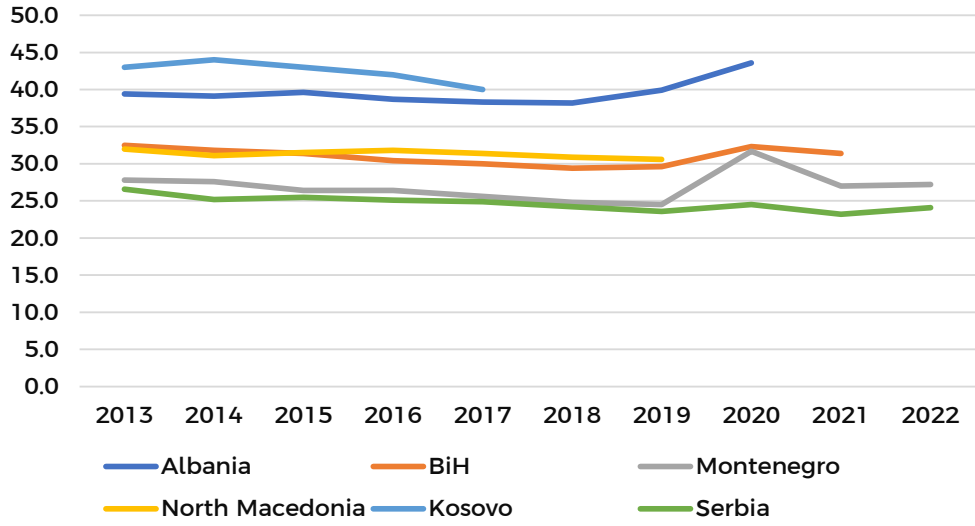
Across all countries, there was an increase in the rate of change in consumer prices for both energy and food items from 2021 to 2022. In 2023, almost all countries experienced decreases in the rate of change for both energy and food prices, though to varying extents. The trends in energy and food prices do not necessarily follow the same patterns, indicating that different factors may influence these two categories independently.

2.2 HOUSEHOLD EXPENDITURES AND LIVING COSTS ADJUSTMENTS

In the dynamic landscape of personal finance, one constant factor that significantly influences household expenditures is the ever-changing tide of prices. The ebb and flow of economic conditions, driven by factors such as inflation, market trends, and global events, have a profound impact on the cost of living. Household expenditure patterns are intricately linked to changes in overall prices, with specific attention to essential categories such as food and energy. The impact of these price changes can significantly influence how individuals and families allocate their budgets, make purchasing decisions, and plan for the future.

Analysing the trends in the final consumption expenditure of households by consumption purpose, specifically focusing on the percentage of total expenditure dedicated to food and non-alcoholic beverages, across the Western Balkan countries for the period 2013 to 2022 reveals interesting insights.

Figure 4: Final consumption expenditure of households by consumption purpose – Expenditures for food and non-alcoholic beverages as % of total, 2013-2022



Sources: Eurostat; National Statistical Office data for Kosovo

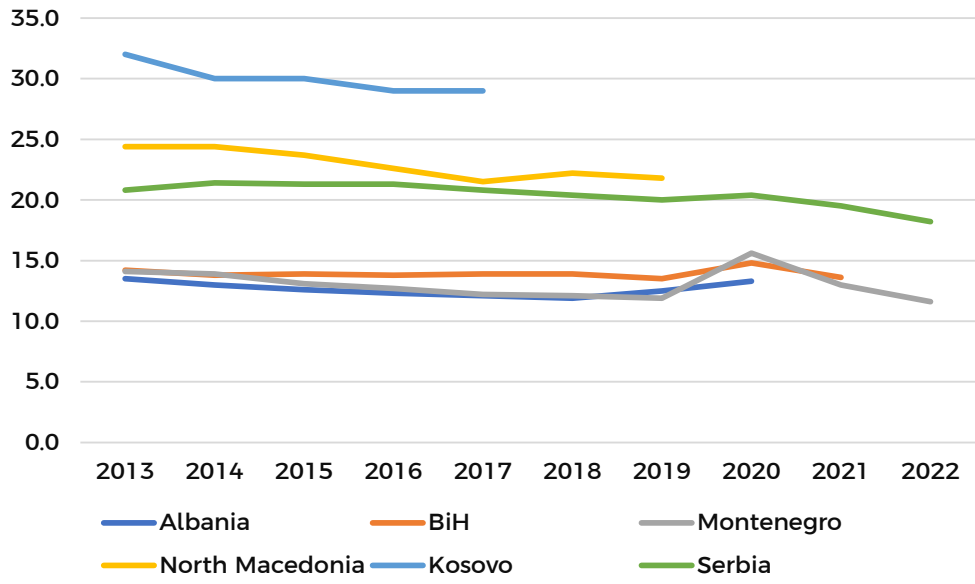
As it can be seen from Figure 4, the percentage has shown an upward trend from 2013 to 2020, reaching its peak at 43.6% in 2020 in Albania. In Bosnia and Herzegovina, the percentage has been relatively stable, with a slight increase from 2013 to 2020, peaking at 32.3%. The data for 2021 shows a decrease to 31.4%. There is a fluctuating

trend, with a decrease from 2013 to 2015, followed by a gradual increase until 2020 (31.7%) in Montenegro. In North Macedonia a generally downward trend is observed, with small fluctuations. The percentage reached its highest point in 2016 (31.8%) but decreased slightly in the following years. Although data for Kosovo are missing after 2017, it can be noted that it experienced small fluctuations with a peak in 2014 (44.0%). In Serbia, data demonstrates a consistent downward trend from 2013 to 2020 (26.6% to 24.5%).

What can be noted in all countries in the region is that data have shown high percentages, indicating a significant portion of household expenditure dedicated to food and non-alcoholic beverages. Also, all countries experienced fluctuations in their trend throughout the period, with the most visible increase around 2020. Fluctuations may be influenced by economic conditions, income levels, and overall economic stability. The change in the trend from 2020 can be partially explained by the impact of the pandemic and market instability caused by the Russian-Ukrainian war.

If we look at the household expenditures for energy items, available data allows for analysis of trend in the final expenditure share on housing, water, electricity, gas, and other fuels. Figure 5 is presenting the data for six Western Balkan countries for the period between 2013 and 2022.

Figure 5: Final consumption expenditure of households by consumption purpose – Expenditures for Housing, water, electricity, gas and other fuels as % of total, 2013-2022



Sources: Eurostat; National Statistical Office data for Kosovo

Figure 5 provides valuable insights in trends of expenditures shares in the final household consumption when it comes to items such are housing, water, electricity, gas, and other fuels. Data reveals that in Albania the percentage has shown an overall upward trend, with slight fluctuations, from 2013 to 2020 (13.5% to 13.3%). In Bosnia and Herzegovina, the share exhibits a relatively stable trend, with a peak in 2020

(14.8%) and a slight decrease in 2021 (13.6%). The trend of expenditure shares in this category in Montenegro showed consistent decrease from 2013 to 2019, where we can see significant increase to 15.6%, after which the trend is declining again. In North Macedonia, the trend demonstrates a consistent decrease from 2013 to 2019 (24.4% to 21.8%). Similar situation was observed in Kosovo for the period 2013 to 2017, and the data for remining years are missing. Data for Serbia displays a generally stable trend from 2013 to 2020 (20.8% to 20.4%). There's a decrease in 2021 (19.5%) and a further decrease in 2022 (18.2%).

Both Kosovo (32.0% in 2013) and North Macedonia (24.4% in 2013) initially had the highest percentages, but there was a significant decrease over the years. Serbia exhibits a relatively stable trend with a gradual decrease. Trend for Bosnia and Herzegovina shows stability until 2020, with a slight decrease in 2021. Montenegro experiences notable fluctuations, with a significant decrease in 2022. Differences in housing market structures, government policies, and economic conditions contribute to variations in expenditure patterns across these countries.

To conclude this section, it can be noted that in terms of food expenditures, all countries experienced fluctuations, with a significant increase around 2020. All countries show high percentages, indicating significant household expenditure being allocated to food items. Albania and Bosnia and Herzegovina had relatively stable trends in energy expenditure. Montenegro, North Macedonia, and Kosovo showed consistent decreases in energy expenditure over the years. Serbia had a generally stable trend in energy expenditure, with a gradual decrease. Overall, both food and energy expenditure patterns differ across countries, reflecting economic dynamics and regional trends. Still it is worth noting that these trends provide insights into the economic conditions and consumption patterns in each country, reflecting changes in priorities and external factors such as inflation or economic stability.

2.3 POVERTY AND INEQUALITY IN WESTERN BALKAN REGION

After an analysis of price and expenditure patterns, this section focuses on an overview of the main poverty and inequality indicators, covering the period 2018–2021. The aim is not to establish a cause-and-effect relationship between price changes and distributional effects, since price may be one of many other factors influencing these changes. Instead of that, the section provides an analysis of the main poverty and inequality indicators and comparisons with price and expenditure patterns changes.

The Western Balkan region has undergone significant transformations in recent decades. Amidst these changes, the issue of poverty remains a critical aspect of the socio-economic landscape. Understanding and addressing poverty in the Western Balkans are imperative not only for the well-being of its populations but also for fostering sustainable development and regional stability.

Firstly, the section delves into the dynamics of poverty within the Western Balkan countries, exploring key indicators such as the at-risk-of-poverty rate (AROP) as a percentage of the population. Table 1 provides insights into developments of AROP from 2018 to 2021 for six Western Balkan countries.

Table 1: At-risk-of-poverty-rate (AROP) % of population by country, 2018-2021

Year	Albania	BiH	Montenegro	North Macedonia	Kosovo	Serbia
2018	23.4	16.9*	23.8	21.9	27.9	24.3
2019	23.0		24.5	21.6		23.2
2020	21.8		22.6	21.8		21.7
2021	22.0		21.2			21.2

*Sources: Eurostat; National Statistical Office data for Albania and Bosnia and Herzegovina; *Data from HBS 2015 (https://www.researchgate.net/publication/338232630_In-Work_Poverty_in_Bosnia_and_Herzegovina)*

The AROP in Albania has shown a slight decrease from 23.4% in 2018 to 22.0% in 2021, suggesting a modest improvement in the poverty situation. Still, there was an increase in AROP rate from 2020 to 2021. Montenegro experienced a decrease in AROP from 23.8% in 2018 to 21.2% in 2021, indicating a potential improvement in poverty rates. The AROP in North Macedonia remained relatively stable, with a slight decrease from 21.9% in 2018 to 21.2% in 2021. Serbia saw a decrease in AROP from 24.3% in 2018 to 21.2% in 2021. Although data indicates similar level of poverty across countries, it is important to note that these comparisons are based on a single indicator (AROP). A comprehensive analysis would require consideration of additional socio-economic factors, poverty thresholds, and trends over multiple years to provide a more nuanced understanding of the size and dynamics of poverty in each country. Therefore, two additional indicators were considered to provide more insights into poverty dynamics in countries were data for them were available.

The first indicator is material and social deprivation rate, which is according to EU definition[3] a proportion of people living in ordinary housing who are unable to meet the costs of at least five out of thirteen basic necessities of life considered desirable or necessary for an acceptable standard of living. Table 2 is providing data for this indicator for five Western Balkan countries for the period 2018-2021.

Table 2: Material and social deprivation rate by country, 2018-2021

Year	Albania	Montenegro	North Macedonia	Kosovo	Serbia
2018	63.5	39.2	38.7	33.0	29.9
2019	61.3	34.0	38.4		24.4
2020	56.5	34.0	33.6		22.6
2021		35.5			21.4

Sources: Eurostat; Data for Bosnia and Herzegovina are not available

The material and social deprivation rate in Albania has shown a decreasing trend from 2018 (63.5%) to 2020 (56.5%). This suggests an improvement in living conditions and access to essential resources for the population in Albania over the specified period. In Montenegro the rate has also decreased, going from 39.2% in 2018 to 34.0% in 2019, remaining constant in 2020, and further increasing to 35.5% in 2021. The material

3 https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Living_conditions_in_Europe_-_material_deprivation_and_economic_strain#Key_findings

and social deprivation rate in North Macedonia remained relatively stable from 2018 (38.7%) to 2019 (38.4%) and then declined to 33.6% in 2020. The stability in 2018 and 2019 followed by a decrease in 2020 suggests some improvement in the situation, but the full trend is not clear without data for 2021. Serbia shows a consistent decline in the material and social deprivation rate from 2018 (29.9%) to 2021 (21.4%). This indicates a positive trend with the population experiencing less material and social deprivation over the specified years.

All four countries have generally seen a reduction in material and social deprivation rates over the specified period, indicating an overall improvement in living conditions. But the rate is still considerably high when compared with the average rate in the EU-27, which was equal to 11.9% in 2021.

Another indicator which is also showing the state of poverty in a country is severe material and social deprivation rate. According to Eurostat[4] it is defined as the proportion of the population experiencing an enforced lack of at least 7 out of 13 deprivation items (6 related to the individual and 7 related to the household). Table 3 is providing data for this indicator for four Western Balkan countries in the analysed period from 2018 to 2021.

Table 3: Severe material and social deprivation rate by country, 2018-2021

Year	Albania	Montenegro	North Macedonia	Serbia
2018	46.7	27.7	22.6	17.4
2019	42.5	21.0	22.1	14.3
2020	38.9	23.0	17.8	14.1
2021	35.2	24.0		13.3

Sources: Eurostat; Data for Bosnia and Herzegovina and Kosovo are not available

The severe material and social deprivation rate in Albania has shown a consistent decline from 2018 (46.7%) to 2021 (35.2%). This suggests an ongoing improvement in the living conditions for the population in Albania over the specified period. Montenegro has experienced a decline in the severe deprivation rate from 2018 (27.7%) to 2020 (24.0%), with an increase in 2021. North Macedonia witnessed a decline in the severe material and social deprivation rate from 2018 (22.6%) to 2020 (17.8%). Serbia shows a consistent decline in the severe material and social deprivation rate from 2018 (17.4%) to 2021 (13.3%). Similar to Albania, this indicates an ongoing improvement in living conditions for the population in Serbia over the specified years.

All four countries have generally experienced a reduction in severe material and social deprivation rates, suggesting an improvement in conditions for the population facing more acute challenges. Albania and Serbia exhibit more consistent and significant declines, while Montenegro and North Macedonia show somewhat slower changes. The specific factors contributing to these trends could include economic improvements, changes in social policies, and targeted interventions to address severe deprivation.

In addition to poverty indicators, the section is also providing insights into inequality indicators with the aim to complete the picture of the socio-economic status of citizens in the region. The first analysed indicator is income quintile share ratio S80/S20 for disposable income which is commonly calculated as the ratio of the total income

4 https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Living_conditions_in_Europe_-_material_deprivation_and_economic_strain#Key_findings

received by the 20% of the population with the highest income (= 1st or top quintile) to that income received by the 20% of the population with the lowest (= 5th or bottom quintile)[5]. A higher ratio indicates greater income inequality. Table 4 is presenting data for six Western Balkan countries for the analysed period 2018-2021.

Table 4: Income quintile share ratio S80/S20 for disposable income by country, 2018-2021

Year	Albania	BiH	Montenegro	North Macedonia	Kosovo	Serbia
2018	6.98	4.90*	7.37	6.16	15.58	8.58
2019	6.38		6.72	5.56		6.46
2020	5.86		5.96	5.92		6.06
2021	5.70		5.81			5.95

*Sources: Eurostat; *Data from HBS 2015*

The S80/S20 ratio in Albania has shown a decreasing trend from 2018 (6.98) to 2021 (5.70). This suggests a reduction in income inequality over the specified period, which is generally considered positive for social and economic stability. Montenegro's S80/S20 ratio has also shown a decrease from 2018 (7.37) to 2021 (5.81). Similar to Albania, this indicates a reduction in income inequality over the specified period in Montenegro. North Macedonia experienced a decline in the S80/S20 ratio from 2018 (6.16) to 2020 (5.95). Kosovo's S80/S20 ratio was relatively high in 2018 (15.58), but due to missing data, it cannot be concluded whether there were significant changes. Serbia's S80/S20 ratio has shown a consistent decline from 2018 (8.58) to 2021 (5.95).

In most of the countries, there is a clear trend towards a reduction in income inequality, as indicated by the decreasing S80/S20 ratios. Kosovo stands out for having a notably high S80/S20 ratio in 2018 compared to other countries.

Another indicator that also shows the level of income inequality in a country is the Gini coefficient. Table 5 presents the Gini coefficient of equivalised disposable income[6] for six countries over the years 2018 to 2021. The Gini coefficient is a measure of income inequality, with higher values indicating greater inequality.

Table 5: Gini coefficient of equivalised disposable income by country, 2018-2021

Year	Albania	BiH	Montenegro	North Macedonia	Kosovo	Serbia
2018	35.4	31.2*	34.7	31.9	44.2	35.6
2019	34.3		34.1	30.7		33.3
2020	33.2		32.9	31.4		33.3
2021	33.0		32.5			33.3

*Sources: Eurostat; *Data from HBS 2015*

5 https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_statistics_on_income_and_living_conditions_(EU-SILC)_methodology_-_distribution_of_income#Main_concepts_used

6 https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_statistics_on_income_and_living_conditions_(EU-SILC)_methodology_-_distribution_of_income#Main_concepts_used

The Gini coefficient for Albania has shown a declining trend from 2018 (35.4) to 2021 (33.0). Montenegro's Gini coefficient has shown a decrease from 2018 (34.7) to 2021 (32.5). North Macedonia experienced a decline in the Gini coefficient from 2018 (31.9) to 2019 (30.7). The increase in 2020 indicates a potential reversal in the trend towards reduced income inequality. Kosovo's Gini coefficient was relatively high in 2018 (44.2) compared with other countries in the region. Serbia's Gini coefficient has shown a decline from 2018 (35.6) to 2021 (33.3).

In most of the countries, there is a trend towards a reduction in income inequality, as indicated by the decreasing Gini coefficients. Kosovo stands out for having a notably high Gini coefficient in 2018, and North Macedonia shows a slight increase in the Gini coefficient in 2021, suggesting a potential reversal of the trend towards reduced income inequality.

In conclusion, the analysis of poverty and inequality indicators in the Western Balkan region from 2018 to 2021 reveals a complex socio-economic landscape marked by both positive and challenging trends. While the at-risk-of-poverty rate (AROP) exhibited variations across the countries, with some experiencing modest improvements and others remaining relatively stable, the material and social deprivation rates showed a general decreasing trend. Albania and Serbia particularly stood out with consistent declines in both material and social deprivation rates, indicating positive strides in improving living conditions for their populations. However, it is crucial to note that despite these improvements, the rates remain considerably higher than the EU-27 average. The analysis of severe material and social deprivation rates further emphasizes positive trends, with all four countries witnessing reductions over the specified period. Albania and Serbia demonstrate more pronounced declines, suggesting ongoing improvements in addressing acute challenges faced by their populations.

Turning to inequality indicators, the income quintile share ratio (S80/S20) and the Gini coefficient shed light on the distribution of disposable income across different segments of society. Across the Western Balkan countries, there is a discernible trend towards reduced income inequality, as evidenced by declining S80/S20 ratios and Gini coefficients. Notably, both Albania and Montenegro experienced consistent declines in both indicators, reflecting a positive shift towards a more equitable distribution of income. However, Kosovo stands out for its initially high S80/S20 ratio and Gini coefficient in 2018, highlighting the need for targeted interventions to address inequality challenges. North Macedonia's slight increase in the Gini coefficient in 2021 suggests a potential reversal in the trend towards reduced income inequality, signalling the importance of ongoing monitoring and policy adjustments.

The economic dynamics in the Western Balkan region are shaped by a complex interplay of factors influencing consumer prices, expenditures, poverty, and inequality. While positive strides have been made, challenges persist, requiring continued attention, targeted interventions, and adaptive policies to foster sustainable development and enhance the well-being of the populations in the years ahead.

3. DISTRIBUTIONAL EFFECTS OF ENERGY AND FOOD PRICE CHANGES ON HOUSEHOLD LIVELIHOODS (CASE STUDY OF BOSNIA AND HERZEGOVINA)

After providing an overview of the previous trends in changes in household expenditure patterns, prices of food and energy products, and main poverty and inequality indicators in Western Balkan region, this section is presenting a case study analysis of the effects of price changes on household livelihoods in Bosnia and Herzegovina. As it can be noted from the analysis provided in the previous section, Bosnia and Herzegovina experienced notable increases in consumer prices of both food and energy items, as well as changes in the expenditure patterns of households. Poverty and inequality remain significant issues in the country. Different government levels and institutions responded to the crises in different ways. According to the report of Bosnia and Herzegovina government to the European Committee of Social Rights[7] several measures were implemented, including:

i) the rise in minimum wage level in both entitites in the period 2021-2023;

ii) the Government of the Federation of Bosnia and Herzegovina adopted a Decree on the provision of assistance to the public due to consumer price index increase (Official Gazette of FBiH, 55/22, 77/22 and 86/22) regulating support for the public by way of one-off payments in cash to pensioners, beneficiaries of entitlements based on veterans of war and disability-related care, persons with disabilities and civilian victims of war, assistance for regular recipients of cash benefits and other material assistance and other types of one-off assistance, for purposes of ensuring financial and material support to improve financial circumstance of the most vulnerable population categories on account of a significant increase in consumer price index;

7 https://rm.coe.int/bih-ad-hoc-report-on-the-cost-of-living-crisis/1680ae1060

iii) according to the Decree on the provision of assistance to the public in Federation of Bosnia and Herzegovina, one-off assistance amounting up to BAM 1,080 may be paid to employees not later than by 31 December 2022, by their employers and these payments are not subject to tax or social security contributions;

iv) increase of salaries for the employees of the administration bodies, public health care institutions, public services, primary and secondary schools and dormitories, Ministry of Interior, judicial institutions, judges and public prosecutors, cultural staff, higher education and student standard staff in Republika Srpska according to a new set of laws on wages (Official Gazette of RS, 119/21) that entered in force as of 01 January 2022;

v) one-off assistance to mitigate the effects of inflation was also provided in Republika Srpka in 2022 for the following population categories: pensioners, veterans of war categories, youth, children of fallen fighters, socially vulnerable persons, parents with four or more children;

vi) in Republika Srpska the assistance for business entities was provided in the form of subsidies provided to companies eligible to employee salary increase incentives from the Ministry of Economy and Entrepreneurship, as well as grants – support for development of economy, improvement of business operation efficacy and introduction of new technologies;

In addition to above mentioned measures, subsidies for agricultural and rural development incentives were increased in both entities. Also, there were several adjustments in the levels of pensions in the analysed period.

In 2021, the RS Government enacted a Decree on determining pricing margin for derivatives of oil, which is still in force. The Decree defines conditions for prescribing of measures for direct control over prices in the territory of Republika Srpska by way of determining maximum amounts of margins to be applied for price formation for derivatives of oil, aimed at mitigating the rise in prices of basic foods items and other products and services in Republika Srpska. When it comes to assisting public in settling their energy expenses, the 2023 Energy Support Package for Westen Balkans in favour of BiH (IPA III), pursuant to the Agreement on financing of the Annual Plan contributing the EU's Western Balkans Energy Support Package in favour of BiH was also implemented, providing support to energy poor and vulnerable households.

The limited evidence on the efficiency of these measures reveals that measures aimed at preventing and mitigating the consequences of the crisis while being timely and welcome were not sufficient, at least when it comes to the agriculture sector.[8] The following analysis aims to provide the cause-and-effect relationship between rises in consumer prices and poverty and inequality, while it is not meant to analyse the efficiency of any or all measures implemented by the respective level of government in the previous period.

8 https://reliefweb.int/report/bosnia-and-herzegovina/un-advises-bosnia-and-herzegovina-authorities-how-overcome-crisis-agriculture-and-ensure-food-security

3.1 LITERATURE REVIEW

The connection between food/energy security and household livelihoods is multifaceted and crucial for the well-being of individuals and communities. Due to the decrease of household incomes, the increase of food prices, and the negative effects of climate change on agricultural production, many countries worldwide are faced with a food insecurity challenge, especially in rural and arid areas (Makoti and Waswa, 2015; Dhraief et al., 2019, Mesquita and Milhorance, 2019; Shanks C et al. 2022). One part of the literature is focused on explaining how different factors are affecting food and energy security including household livelihood as a factor (Deyi Zhou et al., 2019; Mango et al., 2014; Zang et al., 2021; Hasanujzaman and Omar, 2022), while other part is dealing with the influence on household livelihoods caused by food or energy insecurity (Boateng et al, 2020; Phoumin and Kimura, 2019). There is also interconnection between food and energy insecurity, which is characterised by its own cause and consequence relationship. For example, Sola et al. (2016) categorise the link between energy access and food security into three thematic areas, based on the following hypotheses: Energy access influences dietary choices and cooking practices; Poor access to cooking fuel leads to reallocation of household resources from food production and preparation to fuel procurement; Lack of access to energy leads to switches to inferior energy forms, thereby reducing agricultural productivity. Research conducted in Tunisia showed that income and food access, adaptive capacity, and the social safety net were important dimensions of household resilience to food insecurity, being positively correlated with the resilience index.

The term “food insecurity” refers to a situation in which people do not have adequate physical, social or economic access to sufficient and nutritious food. Broadly, food insecurity is assessed using four dimensions i.e., food availability, access to food, stability of supply and safe, and healthy food utilization. Food insecurity may occur at various levels including regional, national, household, or individual. Poverty and food insecurity are deeply related, as poverty may adversely affect the social determinants of health and may create unfavourable conditions in which people might experience unreliable food supply. Food is a major household expenditure for the poor households. Data from African countries indicate that close to half of household income is spent on food: Nigeria (56.4%), Kenya (46.7%), Cameroon (45.6%), Algeria (42.5%). Similarly, within high-income countries, low-income households spend a significant proportion of their income on food: Ireland (14–33%), USA (28.8–42.6%). In comparison, the wealthiest households in the USA spend a much lower 6.5–9.2% of household income on food. Despite spending a large proportion of their household income on food, many poor households continue to remain food insecure because of their insufficient, irregular, and fluctuating incomes (Siddiqui et al., 2020). When households lack access to a reliable and diverse food supply, it can lead to malnutrition and negatively impact the health and productivity of its members. Household livelihoods often depend on income-generating activities, such as agriculture, wage labour, or small businesses. These livelihoods are closely tied to food security because income is needed to purchase food. A lack of income or unstable income sources can result in reduced access to food, which can further exacerbate food insecurity. In research conducted in 2020 (Matkovski et. al, 2020) that compare food security in Western Balkan countries with those in EU, food security was assessed based on FAO set of indicators of food security. The results showed that the stability of food supply is lower in the Western Balkans than in the EU, especially in Albania, Montenegro, and Bosnia and Herzegovina.

In all three countries there is a large per capita food supply variability. In addition, Montenegro has a high dependence on cereal imports, while Bosnia and Herzegovina has the highest level of political instability. In total, four Western Balkan countries (North Macedonia, Serbia, Croatia, and Bosnia and Herzegovina) are among the worst ranked when it comes to food availability.

Energy (in)security is a multidimensional, complex and contested concept used in addressing the several challenges associated with energy access (i.e., affordability, availability, quantity, proximity, reliability, and cleanness), its utility, and consequences (Cook et al., 2008; Hernández, 2016; Murray and Mills, 2014; Smith et al., 2013; Wilkinson et al., 2009). The conceptualization and measurement of energy insecurity at the household level is still a burgeoning field. Energy insecurity has been conceptualized as a social and environmental justice issue (Hernández, 2015) having multiple pathways in its effects on households and individuals. To Hernández (2015), energy insecurity explains the hardships experienced by low-income households with respect to the cost, burdens of household energy, poor housing quality, and related coping strategies. Access to energy, particularly for cooking and food preservation, is essential for food security. Many households rely on various energy sources, such as electricity, gas, or firewood, to prepare meals and store food. A lack of access to clean and reliable energy can limit a household's ability to cook nutritious meals and preserve perishable foods, leading to food wastage and compromised food security.

Agriculture is a primary source of livelihood for many households, especially in rural areas. Ensuring agricultural productivity through access to resources like land, water, seeds, and modern farming techniques is essential for food security. Adequate energy resources, such as irrigation systems and machinery, can significantly boost agricultural production and income. It is expected that the productive use of energy results in increased rural productivity, higher economic growth, increase in rural employment which will raise incomes and also reduce the migration of the rural poor to urban areas (Cabraal et al., 2005). When it comes to the Western Balkans, agriculture is seen as very important for the continuation of sustainable food production, although the region is well supplied with the majority of food products, with some variations between countries (Brankov and Matkovski, 2022).

There are often disparities in food and energy security between rural and urban households. Rural areas may face challenges related to limited infrastructure, access to markets, and energy resources, while urban areas may deal with issues of affordability and access to nutritious food. These disparities can impact livelihoods differently depending on the context. Rural communities are at increased risk for food insecurity due to its correlation with higher poverty rates, lower rates of labour force participation, a less educated population, and lower real personal income (Economic Research Service, 2020; Halverson et al., 2011; Pender, 2019; Powell et al., 2007).

The literature suggests that energy and food insecurities are interrelated and affect households in different patterns, depending on their composition, disposable income and other socio-demographic characteristics. Research conducted in Saudi Arabia showed that the consumption quantities of major food commodities decrease due to high prices and at the same time expenditure increases, which lead to erosion of some of the consumers' savings. High food expenditure makes lower income group more fragile and sensitive for any future increase in food prices. The perception of consumers for price increase in the future is also registered which reflects the lower consumer confidence in the food markets (Yousif and Al-Kahtani, 2014). When it comes to rise in

energy prices, Guan et al. (2023) suggests that high energy prices impose cost burdens on households in two ways. On the one hand, fuel price rises directly household fuel bills (for example, for heating and cooling, cooking and mobility). On the other hand, energy and fossil feedstock inputs needed for the production of goods and services for final household consumption will lead to higher prices of household-expenditure items. Due to the unequal distribution of income, reflected in different household consumption patterns, surging energy prices could affect households in very different ways. Unaffordable costs of energy and other necessities would push vulnerable populations into energy poverty and even extreme poverty.

A rise in energy and food costs can have a significant impact on household consumption patterns. These increases can strain household budgets and force individuals and families to adjust in their spending habits and choices. When energy and food costs increase, households often find that a larger portion of their income is spent on these essential items. This leaves less money available for other discretionary spending, such as entertainment, travel, or non-essential goods. In response to higher food prices, households may opt for cheaper alternatives or lower-cost food items. As energy costs rise, households may implement energy-saving measures, such as using energy-efficient appliances, sealing drafts in their homes, or adjusting thermostats to reduce heating and cooling expenses. These changes can result in lower energy consumption. Higher energy costs, particularly in the form of increased gasoline prices, can influence transportation choices. Households may opt for more fuel-efficient vehicles, use public transportation, carpool, or reduce unnecessary travel to save on fuel expenses. Households may have to divert money that would have been saved or invested into covering increased energy and food costs. For households living on a tight budget, increases in energy and food costs can lead to financial stress.

3.2 METHODOLOGY

The potential effects of the Russia-Ukraine conflict on the energy system, world food supply, and global economy have been examined in numerous studies (Hassen and El Bilali, 2022; Abay et al, 2023; Chowdhury, 2023; Jagtap et al, 2022; Zhou et al, 2023; Allam et al, 2022). Research on household losses has concentrated on rising energy and food bills, energy instability and food insecurity, and poverty brought on by the crisis. However, there is a dearth of quantitative research, particularly in developing countries, on the distribution of effects among households.

In the presence of large inflation differences across product categories, the structure of household expenditures becomes crucial in determining the potential consequences of rising prices on households' finances, living costs and social situation. Depending on their consumption profile, households' exposure to inflationary pressure can be very uneven. The issue of so-called inflation inequality (Menyhért, 2022).

Data on households' expenditure structure and their socio-economic characteristics can be found in Household Budget Survey that was conducted in BiH and there are two latest waves of available data: 2015 and 2021/2022. The survey was conducted jointly by Agency for Statistics of Bosnia and Herzegovina (BHAS), the Federal Institute for Statistics (FZS) and the Republic of Srpska Institute for Statistics (RZSRS). On the basis of a sample of the households, this survey is used to collect the data on the expenditure with special reference to social and economic conditions in which the households live, and enables qualitative and quantitative analysis of living standard and behaviour

of the household regarding the expenditure, taking into the consideration different types of households. The basic purpose of the survey reflects to data collection on the structure and level of the expenditure for consumption according to social economic and geographic features of the households; all the expenditures of the household on products and services for personal consumption is collected.[9] In 2015, the survey included 7,702 households, while the wave in 2021/2022 included 8,660 households. The last wave is capturing the increase in prices of food and energy products, as well as changed patterns of consumption. A detailed classification of sampled households' consumer expenditures by purpose (COICOP) is contained in both datasets.

The research combined two approaches in estimation of effect of food and energy price changes on household consumption patterns based on their extent to poverty. First to estimate static effects of rising the energy prices, we made several simulations based on the approach from Guan et al (2023) in raising the price of energy products and assessing the effect on main poverty and inequality indicators. As explained in the literature review, when energy prices rose, prices for other products, including food, are also increased. Therefore, our approach is based on assessing the distributional effects of rising energy prices, assuming that such an increase will affect the consumption patterns of households. Although we expect such an increase, we do not include in our calculation the expected effect of an energy price increase on the prices of other products. We used data from the HBS wave in 2015[10] to estimate the extent to which households are able to bear the additional increase in energy prices. Assuming that the total expenditure of households remained the same in the short term as before the price increase, the additional energy costs will lead to a reduction in the purchasing power for other essential needs. We used an updated International Poverty Line (IPL), a global absolute minimum of $2.15 per person per day (in PPP) as of September 2022, to assess the poverty level of households in BiH. Scenarios included increases in energy prices and, subsequently, increases in energy expenditures. In the baseline scenario, all households had their actual reported level of disposable income assessed against the fixed poverty line as explained before. In each scenario, we assume different extent of rises in energy prices which have to be paid out of the fixed amount of total income. For each household, we subtracted their additional energy costs from the corresponding total household expenditures. Then their "new" reduced income was assessed using the same fixed poverty line. Our approach makes it possible to obtain an additional number of people in poverty due to the cost of living pressures under each price scenario. Then typical structure of household expenditures was analysed following the distribution of equivalised income quintiles. Income is defined as total monetary income from all sources minus income taxes. In this way, we captured all disposable income received by a household. When a source of income does not concern any individual, but the household as a whole, it is allocated to the household's record. Consequently, the sum of the individual incomes does not necessarily equal to the household's income. The approach implemented followed the one used in EU-HBS survey for household monetary net income variable (HH095)[11].

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9 https://bhas.gov.ba/data/Publikacije/Bilteni/2018/CIS_01_2015_Y1_1_EN.pdf

10 Data that were obtained from BHAS for the HBS wave in 2021/2022 did not include income variables, and therefore, we were not able to use this dataset to calculate poverty and inequality indicators based on disposable household income.

11 https://ec.europa.eu/eurostat/documents/203647/7610424/HBS+User+Manual.pdf/fb5d8371-08fe-4ecf-bca6-b40984fde0b6?t=1624343433403

The variable of total monetary net income was equivalised. Equivalised income is a measure of household income that takes account of the differences in a household's size and composition, and thus is equivalised or made equivalent for all household sizes and compositions[12]. We used the modified OECD equivalence scale that attributes a weight to all members of the household in the following way: 1.0 to the first adult; 0.5 to the second and each subsequent person aged 14 and over; 0.3 to each child aged under 14. The equivalent size is the sum of the weights of all the members of a given household.

This part of the analysis does not consider the behavioural responses of households to changing their consumption patterns caused by the increase in prices of goods and services. As suggested in the literature review, households may react in different ways by reducing their consumption or substituting products and services. To analyse such a response made by households, we applied the approach implemented in Menyhért (2022). First the four main expenditure categories (or special aggregates) were calculated in accordance with the official Eurostat HICP methodology used for inflation calculations: food, energy, non-energy industrial goods and services. These give an exhaustive overview of household financial spending and go into enough detail to properly represent the key cross-sectional disparities in spending patterns between various demographic segments. To create pooled cross-section data setup, we used both waves of HBS survey.

Based on these data, we regressed the expenditure share of two main product categories (food and energy expenditures) on households' socio-demographic characteristics to obtain statistically significant differences in the cross-section. Separate regression analyses are made for food and energy expenditure shares. The socio-economic variables included settlement type, household size, a set of dummy variables for activity status and educational level of the household head, and age of the household head. Similar demographic variables were used in the research conducted in Albania (Çami, 2019) and the Chez Republic (Janský, 2020). Since we are using OLS function with pooled cross sections data, to control for time differences between two periods, we used fixed-effect model as suggested by Raffalovich and Chung (2014) and include dummy variables for each time. However, cohort- and period-specific patterns may have an effect on the pooled profile of individuals and households, as suggested by Galli and Wisch (2022). Therefore, we included interaction variables for all those characteristics because we expect that cohorts may change their behaviour in the analysed period.

Two models were specified separately to assess energy share and food share as dependent variables, while the independent variables were the same in both models. Initial models were specified in the following way:

$$
\begin{aligned}
&Energy\ or\ Food\ share \\
&\quad = \alpha + \beta_1 * year + \beta_2 * \ln\left(total_{expenditures}\right) + \beta_3 * settlement + \beta_4 \\
&\quad * number\ of\ household\ members + \beta_5 * number\ of\ children\ under\ 14 \\
&\quad + \beta_6 * education\ level\ of\ household\ head + \beta_7 \\
&\quad * activity\ status\ of\ household\ head + \beta_8 * age\ of\ household\ head \\
&\quad + \beta_9 * square\ of\ age\ of\ household\ head + \varepsilon
\end{aligned}
$$

12 https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Equivalised_income

Where:

- Energy share: share of expenditures for energy items in total expenditures (COICOP 4 and 7)
- Food share: share of expenditures for food items in total expenditures (COICOP 1 and 2)
- Year: indicating the wave of HBS data (the base year is 2015).
- Logarithm of total expenditures: logarithmic value of all expenditures by households
- Settlement: type of settlement where the household lives (1: urban; 2: other)
- Number of household members: Total number of members living in a household
- Number of children under 14: Total number of children under 14 living in a household
- Education level of household head: the highest education level attained by the household head (1: Elementary education or less; 2: Secondary education; 3: Tertiary education)
- Activity status of the household head: the current activity status of the household head (1: Full-time employee; 2: Part-time employee; 3: Unemployed; 4: Inactive)
- Age of household head: a continuous variable on the age of household head
- Square of age of household head: variable with square of age of household head

We added interaction variables to the initial model gradually to test changes in the coefficients and statistical significance of each interaction. The results of the research aim to inform policy decisions on social protection schemes for the most vulnerable groups of population in the cases of high inflationary pressures. Examples of such use can be found in UNICEF report for Serbia from 2022[13], in World Bank report for Ghana from 2006[14], in Mali (2016)[15], in Oregon (2006)[16] and EU (2023)[17]. The analysis conducted in the UNICEF report for Serbia in 2022 utilised microsimulation models to assess the impacts of the COVID-19 pandemic and the war in Ukraine on the poverty rate, especially among children. Results showed that COVID-19 would have negatively impacted poverty rates in Serbia had there not been ad hoc cash transfers to reduce its effects. When it comes to the effects of the Ukraine war, simulations showed that in each scenario, the poverty rate would increase, reflecting that the average household income is expected to grow at a lower rate than inflation, reducing household purchasing power.

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13 https://www.unicef.org/serbia/en/reports/development-poverty-projections-based-potential-impact-conflict-ua

14 https://openknowledge.worldbank.org/server/api/core/bitstreams/abb7d06e-686c-5df1-8a10-96a22b9aad26/content

15 https://www.zbw.eu/econis-archiv/bitstream/11159/40910/1/EBP071804803_0.pdf

16 https://www.researchgate.net/publication/230140622_Linking_Policy_and_Outcomes_A_Simulation_Model_of_Poverty_Incidence

17 https://www.ecb.europa.eu/pub/economic-bulletin/articles/2023/html/ecb.ebart202303_02~037515ed7d.en.html

3.3 RESULTS

Based on the methodology approach explained in the previous section, the first part of the analysis assessed the distributional effects of rising prices of energy items on the main poverty and inequality indicators. Simulations included three different scenarios to assess how additional price increases burden households on average. The real increase in prices of energy items that was recorded in BiH in 2022 compared to 2021 was 17.4%, as presented in the section 2.1. Therefore, simulations were designed to reflect a range of changes lower and higher from the real change that happened. The first simulation assessed it with 10% increase, the second one represents the real increase of 17.4%, while with the third simulation the additional increase of up to 20% was assessed. The results are presented in Table 6.

Table 6: Results of simulations of energy price increases on the main poverty and inequality indicators in BiH, 2015

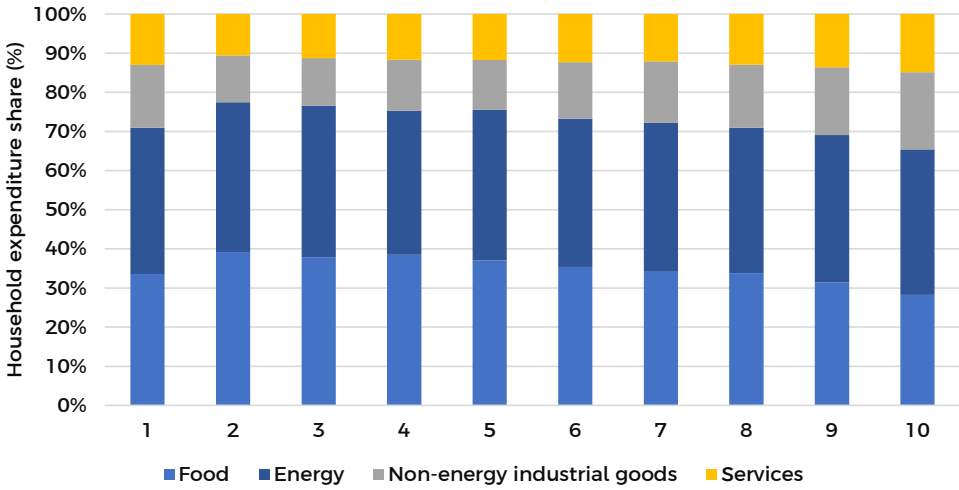
Indicator	Baseline	Simulation 1 (10% increase)	Simulation 2 (17.4% increase)	Simulation 3 (20% increase)
Poverty rate (%) – Individuals	25.43	27.90	30.44	31.14
Poverty rate (%) – Households	21.51	23.78	26.29	27.07
Gini coefficient	0.3900	0.3989	0.4072	0.4097

Source: Own calculations based on BiHMOD

The results indicate that as energy prices increase, the poverty rate for individuals also rises. The higher the energy price, the greater the percentage of individuals experiencing poverty. Simulation 3, with a 20% increase, shows the highest impact, indicating a more pronounced effect on individual poverty rates. Similar to the individual poverty rate, the household poverty rate increases with higher energy prices. Simulation 3 again shows the highest impact, indicating a larger increase in household poverty rates. The impact is observed both at the individual and household levels, suggesting a potential strain on overall economic well-being. The Gini coefficient, a measure of income inequality, increases with higher energy prices. This suggests that energy price hikes contribute to a more unequal distribution of income in BiH. The widening gap between the rich and the poor is reflected in the higher Gini coefficient values in each simulation. Simulation 3 has the highest increase, suggesting a more significant impact on income inequality compared to the other simulations. When it comes to the real increase captured by the second simulation, the increase in individual poverty rate compared with baseline was 4.01 percentage points, while household poverty rate increased for 4.78 percentage points. The increase in Gini coefficient is not substantial, but still it shows that the gap between the poor and the rich widens as energy prices rise. In summary, all indicators (individual poverty rate, household poverty rate, and Gini coefficient) demonstrate a consistent trend of worsening conditions as energy prices increase. Simulation 3 consistently shows the highest impact across all indicators, highlighting the sensitivity of the population to larger energy price increases in Bosnia and Herzegovina.

As suggested in the literature review, changes in energy prices may affect households differently based on their expenditure patterns. Results presented in Figure 6 show that households with incomes in different deciles spend their income differently.

Figure 6: Structure of household expenditures by income quintile, BiH 2015

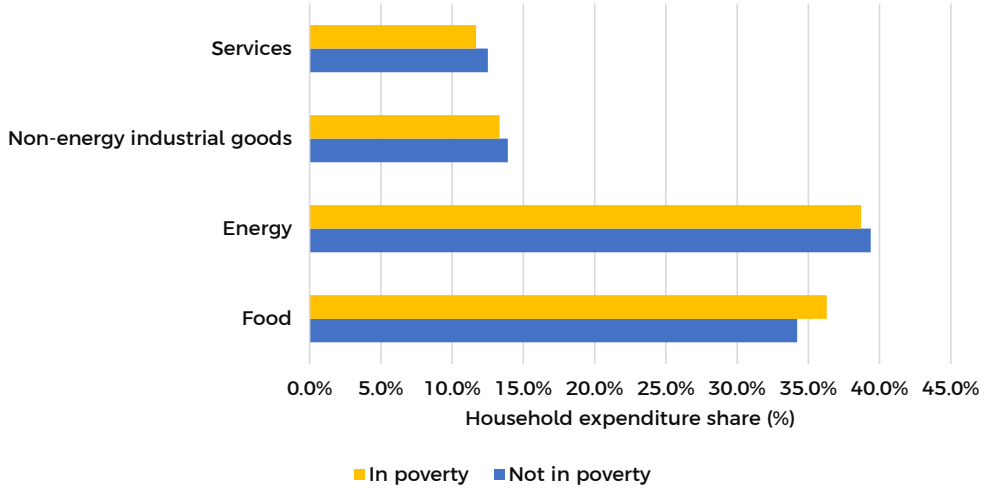


Source: Own calculations based on BiHMOD; Expenditure shares calculated as Food (COICOP 1 and 2), Energy (COICOP 4 and 7), Non-energy industrial goods (COICOP 3, 5 and 12) and Services (COICOP 6, 8, 9, 10 and 11). Income deciles based on the equivalised total household income.

Data show that the percentage of income spent on food generally decreases as income decile increases. The highest income decile (10) allocates the smallest percentage (28.2%) to food, while the lowest income decile (1) allocates the highest percentage (33.6%). The data suggests a relatively consistent pattern for energy expenditure across income deciles, with slight fluctuations. The variation in the percentage of income spent on energy is not as pronounced as in food expenditure. There is a general trend of increasing expenditure on non-energy industrial goods as income decile rises. The lowest income decile (1) allocates the smallest percentage (16.0%) to non-energy industrial goods, while the highest income decile (10) allocates the largest percentage (19.8%). Similar to non-energy industrial goods, there is a trend of increasing expenditure on services as income decile increases. The lowest income decile (1) allocates the smallest percentage (13.0%) to services, while the highest income decile (10) allocates the largest percentage (14.8%). In summary, the expenditure patterns across income deciles show that lower-income households tend to allocate a higher percentage of their income to essential items like food. As income increases, households allocate a larger proportion of their budget to non-essential items such as non-energy industrial goods and services. Energy expenditure remains relatively stable across income deciles, indicating that it constitutes a relatively consistent share of household budgets regardless of income level.

A similar analysis was made comparing those households that are assessed as poor with those that are not in baseline scenario. The poverty assessment was made as explained in Section 3.2, assessing the equalised household income per household member against the International Poverty Line.

Figure 7: Structure of household expenditures by poverty status, BiH 2015



Source: Own calculations based on BiHMOD; Expenditure shares calculated as Food (COICOP 1 and 2), Energy (COICOP 4 and 7), Non-energy industrial goods (COICOP 3, 5 and 12) and Services (COICOP 6, 8, 9, 10 and 11).

As it can be seen at Figure 7, households in poverty allocate a slightly higher percentage of their income to food compared to those not in poverty. This may suggest that essential needs like food constitute a relatively larger share of the budget for households experiencing poverty. There is a marginal difference in energy expenditure between households in and not in poverty. Both groups allocate a substantial portion of their income to energy, indicating that energy costs are a significant consideration for all households. Households in poverty allocate a slightly smaller percentage of their income to non-energy industrial goods compared to those not in poverty. This may reflect a focus on essential items and a reduction in spending on non-essential goods for households experiencing poverty. Similar to non-energy industrial goods, households in poverty allocate a slightly smaller percentage of their income to services compared to those not in poverty. This might indicate that spending on services, which can include healthcare, education, and recreation, is reduced for households experiencing poverty. The provided data suggests that households in poverty tend to allocate a slightly higher percentage of their income to food and a slightly lower percentage to non-energy industrial goods and services compared to those not in poverty. Energy expenditure shows a relatively small difference between the two groups. These patterns highlight the prioritization of essential needs and potential reductions in non-essential spending for households in poverty.

As the previous analysis suggests, households in BiH are affected by price changes for energy items, given that both poverty and inequality rates would increase if those prices rose. Households in different income decile groups and poverty status spend their income differently. Following the methodological approach, to assess the demographic characteristics of households in BiH and their influence on expenditure patterns, regression analysis was performed using cross-section pooled data from two waves of HBS, the first conducted in 2015 and the second conducted in 2021/2022. Before presenting the results of regression analysis, Table 7 presents the average shares of expenditures per group of items in two analysed periods.

Table 7: Average shares of expenditures per group of items by year, 2015-2022

	Share of expenditures on food items	Share of expenditures on energy items	Share of expenditures on non-energy items	Share of expenditures on services items
2015	34.66%	39.18%	13.81%	12.35%
2022	33.18%	39.64%	13.07%	14.11%

Source: Authors own calculations

The results show that share of expenditures on food items on average decreased slightly from 34.66% in 2015 to 33.18% in 2022. This suggests that consumers spent a slightly smaller proportion of their budget on food items in 2022 compared to 2015. Share of expenditures on energy items on average increased slightly from 39.18% in 2015 to 39.64% in 2022. This indicates a slight increase in the proportion of spending on energy items over the years. When it comes to the share of expenditures on non-energy items, it decreased on average from 13.81% in 2015 to 13.07% in 2022. On the contrary, share of expenditures on services items on average increased from 12.35% in 2015 to 14.11% in 2022. This indicates a noticeable increase in the proportion of spending on services items over the years. Overall, the table suggests a slight shift in consumer spending patterns over the years, with a decrease in spending on food and non-energy items, a slight increase in spending on energy items, and a more noticeable increase in spending on services items.

The following regression analysis explains how different households changed their expenditures over time. Based on the models' specifications, results have been obtained for energy and food expenditure shares separately. The results in Table 8 and Table 9 first presents initial model specification (Model 1), the second column is presenting results after we added interaction variable for the total expenditures (Model 2) and the last column is presenting the results after several interaction variables were added to test the differences between cohorts over time (Model 3).

Table 8: Results of regression analysis for dependent variable energy expenditure share, 2015-2022

Energy expenditure share	Model 1 (Sig)	Model 2 (Sig)	Model 3 (Sig)
Year (base 2015)	.0170***	-.1006***	-.0274
Logarithm of Total expenditures in 1000	-.0573***	-.0649***	-.0604***
Logarithm of Total expenditures in 1000 * Year (base 2015)	NI	.0164***	.0063
Settlement: Other (base Urban)	-.0245***	-.0249***	-.0353***
Settlement: Other (base Urban) *Year (base 2015)	NI	NI	.0195***
Number of household members	-.001	-.0013	-.0025*
Number of household members * Year (base 2015)	NI	NI	.0029*
Number of children younger than 14	-.0039*	-.0038*	-.0039*
Education (base Elementary school or less)			
Secondary education	.0188***	.0193***	.0246***
Tertiary education	.0289***	.0294***	.0203***
Education (base Elementary school or less) * Year (base 2015)			
Secondary education (base 2015)	NI	NI	-.0112**
Tertiary education (base 2015)	NI	NI	.0137*
Activity status (base Full-time employee)			
Part-time employee	-.0158**	-.0159**	-.0129
Unemployed	.0047	.0054	.0142**
Inactive	-.001	-.0008	.0134***
Activity status (base Full-time employee) * Year (base 2015)			
Part-time employee (base 2015)	NI	NI	.0029
Unemployed (base 2015)	NI	NI	-.0175**
Inactive (base 2015)	NI	NI	-.0271***
Age	.0011**	.0011**	.0012**
Age squared	.0000*	.0000*	.0000*
Constant	.7688***	.8227***	.7874***

**** p<.01, ** p<.05, * p<.1, NI – Not included in the model specification*

Source: Authors own calculations

The table presents the results of a regression analysis for the dependent variable "energy expenditure share" from 2015 to 2022. The coefficient for Year suggests that for each additional year from the base year 2015, the energy expenditure share increases by 0.0170 in the initial model. However, in Models 2 and 3, the coefficients are negative (-0.1006 and -0.0274), indicating a steeper decline in energy expenditure share over time. The coefficient for the variable Logarithm of Total expenditures in 1000 is negative

in all models, indicating that as total expenditures increase (expressed in logarithmic form), the energy expenditure share decreases. The effect is slightly stronger in Models 2 and 3. The coefficients for settlement type "Other" compared to "Urban" are negative, suggesting that in settlements categorized as "Other," the energy expenditure share tends to be lower than in urban areas. The coefficients for the number of household members are negative, indicating that as the number of household members increases, the energy expenditure share tends to decrease slightly. This effect becomes stronger in Model 3. When it comes to the variable on the number of children younger than 14, the coefficients are negative, indicating that households with more children younger than 14 tend to have lower energy expenditure shares.

Both secondary and tertiary education levels of household head show positive coefficients, suggesting that higher education levels are associated with higher energy expenditure shares. The interaction term for education and year shows varying effects. For example, in the fully extended model, the coefficient for secondary education is negative, indicating that over time, those households where the household head holds secondary education level tends to decrease their energy expenditure share. The coefficients for variables on the activity status of the household head show mixed effects. For instance, being unemployed is associated with higher energy expenditure shares compared to being a full-time employee. Interaction terms between activity status and year show additional effects over time. For instance, in Model 3, having household head who is unemployed or inactive is associated with a decrease in energy expenditure share over time. Both age of household head and age squared have positive coefficients, suggesting a curvilinear relationship between age and energy expenditure share.

Overall, these results suggest that various demographic, socioeconomic, and temporal factors significantly influence energy expenditure shares over the period studied. Table 9 presents the results of regression analysis for food expenditure share as dependent variable. Same as for the energy expenditure share, results for the food expenditure share present Model 1 as the initial model specification, Model 2 as the model where we added interaction variables for the total expenditures, and Model 3 where several interaction variables were added to test the differences between cohorts over time.

Table 9: Results of regression analysis for dependent variable food expenditure share, 2015-2022

Food expenditure share	Model 1 (Sig)	Model 2 (Sig)	Model 3 (Sig)
Year (base 2015)	-.0077***	-.0992***	-.158***
Logarithm of Total expenditures in 1000	-.0011	-.0071***	-.0114***
Logarithm of Total expenditures in 1000 * Year (base 2015)	NI	.0127***	.024***
Settlement: Other (base Urban)	.0346***	.0344***	.0458***
Settlement: Other (base Urban) *Year (base 2015)	NI	NI	-.0213***
Number of household members	-.0003	-.0004	.0032**
Number of household members * Year (base 2015)	NI	NI	-.0076***
Number of children younger than 14	.0121***	.0122***	.0124***
Education (base Elementary school or less)			
Secondary education	-.021***	-.0207***	-.0251***
Tertiary education	-.0528***	-.0525***	-.0502***
Education (base Elementary school or less) * Year (base 2015)			
Secondary education (base 2015)	NI	NI	.0097*
Tertiary education (base 2015)	NI	NI	-.002
Activity status (base Full-time employee)			
Part-time employee	.032***	.0319***	.0382***
Unemployed	.0188***	.0193***	.0202***
Inactive	.01***	.0102***	.0032
Activity status (base Full-time employee) * Year (base 2015)			
Part-time employee (base 2015)	NI	NI	-.0254**
Unemployed (base 2015)	NI	NI	-.0009
Inactive (base 2015)	NI	NI	.0135***
Age	.0027***	.0027***	.0027***
Age squared	.0000***	.0000***	.0000***
Constant	.246***	.2879***	.3062***

**** p<.01, ** p<.05, * p<.1, NI – Not included in the model specification*

Source: Authors own calculations

As the results show for the variable Year, the coefficient is negative and statistically significant across all models, indicating that as the years progress, there is a decrease in the food expenditure share. The coefficient for the logarithm of total expenditures is negative and statistically significant in Models 2 and 3. This suggests that as total expenditures increase, the food expenditure share decreases.

The coefficient for settlement type 'Other' compared to 'Urban' is positive and statistically significant in all models. This indicates that households in 'Other' settlements tend to have a higher food expenditure share than those in urban areas. The interaction term shows that households living in non-urban regions in 2022 decreased their food expenditures compared with the same group in 2015. For the variable on number of household members, the coefficient is positive and statistically significant only in Model 3. It suggests that as the number of household members increases, the food expenditure share also increases. Those households with higher number of members decreased their food expenditure share in 2022 compared with the same households in 2015. The coefficient is positive and statistically significant across all models for the variable on number of children younger than 14. This implies that households with more children under 14 tend to allocate a higher share of their expenditures towards food.

Compared to elementary education or less, both secondary and tertiary education levels of household heads show negative coefficients across all models, indicating that as education level increases, the food expenditure share decreases. Compared to full-time employees as household heads, part-time employees and unemployed individuals tend to allocate a higher share of their expenditures towards food, as indicated by positive coefficients in all models. Both age of the household head and age squared have positive coefficients, suggesting a nonlinear relationship with food expenditure share. This implies that initially, as age increases, the food expenditure share increases, but at a decreasing rate.

Overall, the analysis suggests that various socio-economic factors such as income, household composition, settlement type, education level, employment status, and age influence the food expenditure share of households.

The results from the regression analyses for energy and food expenditure shares reveal intresting differences and similarities. In terms of temporal trends, while the coefficient for Year is positive in the initial model for energy expenditure, indicating an increase over time, it turns negative in the extended models, suggesting a decline in energy expenditure share over the years. Conversely, for food expenditure, the coefficient for Year is consistently negative across all models, indicating a decrease in food expenditure share as the years progress. Regarding socioeconomic factors, the logarithm of total expenditures exerts a negative effect on both energy and food expenditure shares, implying that as total expenditures increase, both shares decrease, though this effect is more pronounced for food. Settlement type also demonstrates contrasting effects: while 'Other' settlements have lower energy expenditure shares compared to urban areas, they exhibit higher food expenditure shares. Moreover, household composition plays a role in both scenarios, with larger households allocating more towards food expenditure. Interestingly, education levels of household heads show opposite effects on energy and food expenditure shares, with higher education levels associated with lower food expenditure shares but higher energy expenditure shares. Additionally, employment status influences food expenditure shares, with unemployed individuals and part-time employees allocating more towards food. These findings underscore the intricate interplay of demographic, socioeconomic, and temporal factors in shaping household expenditure patterns, highlighting distinct dynamics between energy and food expenditures.

4. CONCLUSIONS AND RECOMMENDATIONS

The study emphasizes the complex and diverse consequences of energy and food price increases on household livelihoods in the Western Balkans. The effects are shaped by several interrelated factors such as the extent of price hikes, the overarching economic climate, governmental policies, and the unique circumstances of individual households. Despite evident challenges such as price spikes and ongoing issues of poverty and inequality, the importance of a comprehensive assessment is underscored. The aim of this study was to gain insights that can guide future responses and the formulation of effective policies, highlighting the need for a nuanced and adaptable approach to address the multifaceted nature of these challenges.

The regional overview provided in the second section of this study highlights a common trend across countries, showing an increase in the rate of change in consumer prices for both energy and food items from 2021 to 2022. However, a notable shift occurred in 2023, with all countries experiencing decreases in the rate of change for both energy and food prices, albeit to varying degrees. Importantly, the analysis reveals that the trends in energy and food prices do not exhibit uniform patterns, suggesting that distinct factors may independently influence these two categories. Moreover, all countries experienced fluctuations in food expenditures, with a significant surge around 2020, indicating a noteworthy allocation of household budgets to food items. In terms of energy expenditures, Albania and Bosnia and Herzegovina displayed relatively stable trends, while Montenegro, North Macedonia, and Kosovo consistently witnessed decreases. Serbia demonstrated generally stable energy expenditure with a gradual decrease. The analysis also revealed that a significant portion of household budgets are dedicated to food and energy items, therefore indicating that households in the region could be substantially affected when price shocks for these items occur.

The analysis of poverty and inequality indicators in the Western Balkan region from 2018 to 2021 reveals a nuanced socio-economic landscape. While some countries show positive trends, such as declines in at-risk-of-poverty rates and material and social deprivation, challenges persist, with rates remaining notably higher than the EU-27 average. Notable improvements in addressing acute challenges are observed in Albania and Serbia. In terms of income inequality, there is an overall positive trend towards reduced inequality across the region, exemplified by declining S80/S20 ratios and Gini coefficients. However, Kosovo faces notable challenges, and North Macedonia's slight increase in the Gini coefficient in 2021 warrants ongoing attention. The findings underscore the need for targeted interventions and continuous monitoring to address persistent socio-economic disparities in the Western Balkans, especially when it comes to price shocks for basic household items.

The case study analysis conducted in Bosnia and Herzegovina established a cause-and-effect relationship between rises in energy prices and distributional effects in terms of poverty and inequality. The analysis revealed a clear and consistent trend: as energy prices increase in Bosnia and Herzegovina, there is a rise in both individual

and household poverty rates, indicating a potential strain on overall economic well-being. The Gini coefficient, a measure of income inequality, also increases with higher energy prices, signalling a widening gap between the rich and the poor. Simulation 3, with a 20% increase in energy prices, consistently shows the highest impact across all indicators, emphasizing the heightened sensitivity of the population to larger energy price hikes. The data analysis across income deciles reveals distinct expenditure patterns that reflect household priorities and consumption behaviours. Lower-income households tend to allocate a higher percentage of their income, specifically 33.6%, to essential items like food. As income decile increases, there is a consistent shift in spending towards non-essential items such as non-energy industrial goods and services. The highest income decile allocates the smallest percentage (28.2%) to food but the largest percentages to non-energy industrial goods (19.8%) and services (14.8%). Notably, energy expenditure remains relatively stable across income deciles, indicating that it constitutes a consistent share of household budgets regardless of income level. These findings provide valuable insights into the economic behaviour of households across different income brackets, emphasizing the varying priorities and consumption patterns influenced by income disparities.

The data analysis indicates that households in poverty in Bosnia and Herzegovina tend to allocate a slightly higher percentage of their income to essential needs like food compared to those not in poverty. This suggests that food constitutes a relatively larger share of the budget for households experiencing poverty. Despite a marginal difference in energy expenditure between households in and not in poverty, both groups allocate a significant portion of their income to energy, indicating that energy costs are a significant consideration for all households, regardless of their economic status. Furthermore, households in poverty tend to allocate a slightly smaller percentage of their income to non-energy industrial goods and services compared to those not in poverty. This may reflect a prioritization of essential items and a reduction in spending on non-essential goods and services for households experiencing poverty. These patterns highlight the financial challenges faced by households in poverty and their strategic allocation of resources to meet basic needs while minimizing spending on non-essential items.

The findings from the regression analyses on energy and food expenditure shares highlight several noteworthy conclusions. Firstly, there are clear temporal trends observed, with energy expenditure shares initially increasing over time before declining in extended models, whereas food expenditure shares consistently decrease as the years progress. This suggests evolving consumer behavior and changing economic conditions impacting expenditure patterns differently for energy and food. Secondly, socioeconomic factors such as total expenditures, settlement type, household composition, education levels, and employment status significantly influence both energy and food expenditure shares. Notably, higher education levels are associated with lower food expenditure shares but higher energy expenditure shares, indicating varying preferences and priorities across different expenditure categories. Additionally, settlement type and employment status exhibit contrasting effects on energy and food expenditure shares, highlighting the nuanced interplay between demographic, socioeconomic, and temporal factors in shaping household expenditure patterns. Overall, these findings underscore the complexity of household consumption decisions and the need for comprehensive policy approaches to address diverse expenditure dynamics effectively.

Considering the aim of the study as well as the presented results, several recommendations for policymakers in the region have been developed. Governments in the region should continue providing targeted social support programs focusing on lower-income households, those with a higher number of household members, those living in non-urban settlements, and those with unfavourable labour market statuses of household heads to alleviate the impact of rising energy and food prices. These programs could include subsidies, direct financial assistance, or initiatives to enhance energy efficiency in homes. Policymakers could also develop policies to stabilise energy and food prices to minimise the negative effects on household budgets. This could involve strategic interventions, market regulations, or exploring alternative energy sources to reduce dependency on volatile markets. Social safety nets should be further strengthened to provide a buffer for households facing economic challenges. This may involve expanding social welfare programs, improving unemployment benefits, and ensuring accessibility to essential services. The progress in addressing income inequality in some countries should be continued. Income inequality mitigation could include progressive taxation, targeted wealth redistribution, and policies that promote inclusive economic growth. In addition, energy efficiency programs may help reduce the overall burden of energy costs on households. This can include initiatives promoting energy-saving technologies, renewable energy sources, and education on cost-effective energy consumption. Since one of the constraints for evidence-based policy-making is a lack of up-to-date and publicly available data, governments in the region should establish monitoring systems and early warning mechanisms to track changes in poverty rates, inequality, and expenditure patterns. This enables timely policy adjustments and interventions based on evolving economic conditions. And finally, we must emphasise that fostering regional collaboration among Western Balkan countries to share best practices, policy insights, and collaborative solutions to common socio-economic challenges can enhance the effectiveness of policy responses.

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