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The Income and Food Security Effects of Global Wheat Trade Disruptions

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1. Introduction

The Russia-Ukraine conflict raises numerous concerns about global trade in grain as Russia and Ukraine are major exporters of wheat, corn, and other food staples worldwide. In the wake of the crisis, global wheat prices are expected to increase by more than 40% in 2022 from the already historically high levels brought on by the COVID-19 pandemic. In the long-term, wheat prices are expected to start decreasing in 2023; however, they will still be almost 25% higher in 2024 than in the pre-war period (Figure 1). While wheat occupies a relatively small place in the agricultural sector of African countries, as of 2019, almost 60% of African countries (30 countries) imported wheat products directly from Ukraine and Russia.

In addition, most African countries (45) are highly dependent on wheat imports to satisfy their domestic consumption needs, as seen in import penetration rates of over 50%. Furthermore, many countries (23) import more wheat than they need for their own domestic consumption. This raises the issue of contagion, as many countries are exposed to the crisis not through direct involvement in the global wheat market, but through re-exports by their neighbors (Badiane et al., 2022).

The disruption of global wheat markets is likely to have macroeconomic effects in most countries. Wheat supply disruptions and price spikes caused by the Russia-Ukraine conflict will have considerable sectoral implications and will affect food price inflation and food security. This analysis, therefore, looks at the effects of the disruption of global wheat prices among the study countries on (i) gross incomes, (ii) general food price inflation, and (iii) food consumption levels.

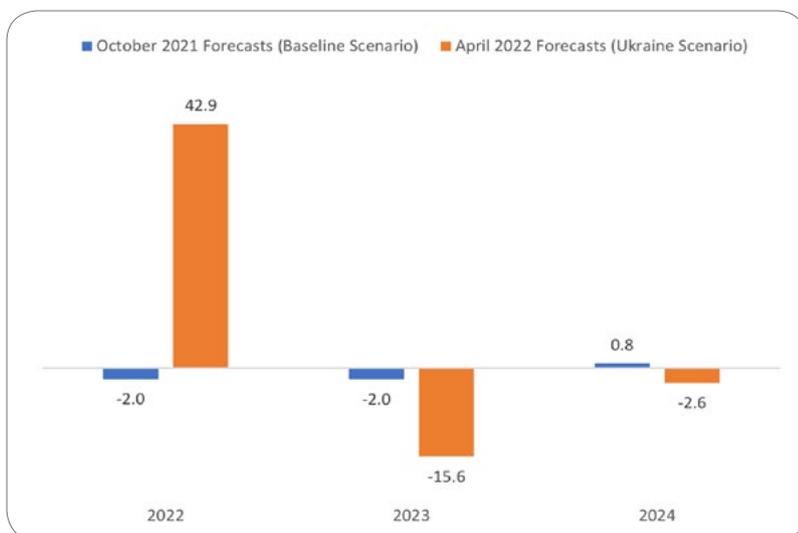
THE UKRAINE CRISIS
AND AFRICAN ECONOMIES

¹An earlier part of this project estimated the levels of direct and indirect trade exposure of African countries.
<https://akademiyaz063.org/publications/Ukraine%20Crisis%20and%20African%20Countries/Brief-01-AKADEMIYA2063%20Ukraine%20Crisis%20Brief%20Series.pdf>

For both rural and urban areas, the results are disaggregated by income groups ranging from the bottom quintile (poorest 20%) to the top quintile (richest 20%). Where country data allows, the results are also disaggregated between farm and non-farm households.

The findings suggest that trade effects are likely to differ strongly between rural and urban households due to their different income sources and consumption patterns. Moreover, impacts among rural households will likely vary between farm and non-farm households. Finally, the impacts are expected to vary between poor and non-poor households in rural and urban areas.

Figures 1: Changes in International Price of Wheat, US HRW*, Percentage Annual Changes



* Hard Red Winter

Source: World Bank, Commodity Markets Outlook (2021 and 2022).

2. The Effects of Rising Wheat Prices on Household Incomes

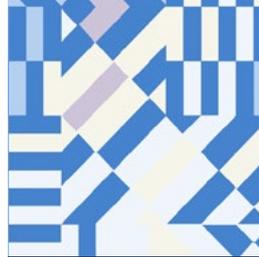
Wheat and wheat products imported by African countries are, in most cases, intermediate inputs used by the processing (milling and baking) industries. When their import prices go up, they not only contribute to raising the prices of cereals and other wheat substitutes, but they also reduce the level of activities and increase costs in these industries, consequently increasing the prices of their products within domestic markets. As higher prices raise expenditures on wheat products and other cereals, they reduce the income available for spending on other goods. The effect of rising global wheat prices is therefore equivalent to a tax on incomes, seen in the generalized decrease in incomes.

Figures 2a and 2b present the projected effects on household income. Results for the first set of countries (Kenya, Nigeria, Senegal, and Tanzania) are categorized into rural and urban households, while results for the second group of countries (Ghana, Mozambique, Uganda, and Malawi) provide additional disaggregation of findings between rural farm and non-farm households. The induced reduction in gross incomes observed in both rural and urban areas is weakest among Nigerian households and strongest among Senegalese households.

The effects on urban incomes in Tanzania are similar to those observed in Nigeria.

The differences in income effects observed across the selected countries reflect the relative sizes of the wheat processing industries in the respective economies and the share of wheat products in household expenditures. Results also suggest that the richest households are the most affected. Incomes among the top two quintiles - the richest 40% - tend to decline more in comparison to the bottom 60%, in both rural and urban households in Kenya and Tanzania and among rural households in Senegal, as the crisis drags into 2024. In contrast, in Nigeria, urban households in the fourth quintile - the second richest 20% - tend to earn a higher share of incomes from activities in the cereal processing sector and are therefore affected more severely.

Figures 2b show the results among countries where it was possible to separate rural farm from rural non-farm households. Among this group, the lowest income effect is observed among rural non-farm and urban households in Ghana and rural farm and urban households in Uganda.



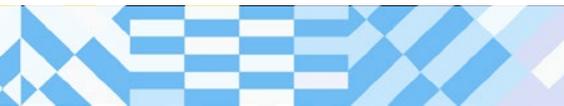
In contrast, the strongest income effects are observed in Mozambique across all rural and urban households. In Ghana and Mozambique, incomes among rural farm households are affected much more than incomes among rural non-farm and urban households. In Malawi, it is rural farm incomes and urban incomes that are most affected.

As observed earlier, the income effects persist with sustained high wheat prices over the next three years. The only cases where incomes start to recover by 2024 are among rural non-farm households in Uganda and rural farm households in Malawi. Overall, the effects on household incomes continue through 2024 and tend to increase across all countries in this group as wheat prices remain high and producers and consumers adjust to changes throughout the economy.

Figures 2a: Changes in Gross Income vs Baseline (%)



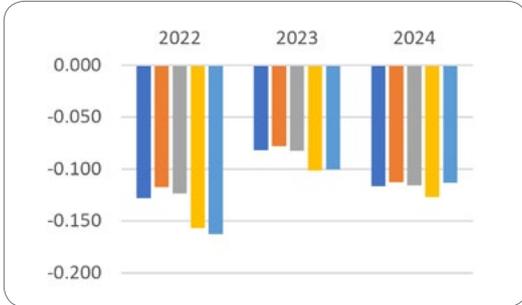
Source: Authors' simulation results



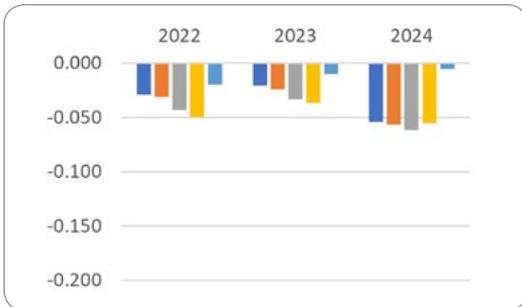
Figures 2b: Changes in Gross Income vs Baseline (%)

GHANA

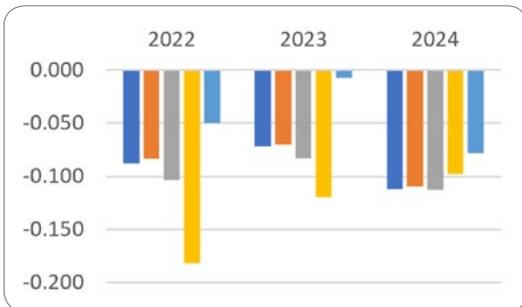
Rural Farm Households



Rural Non-farm Households

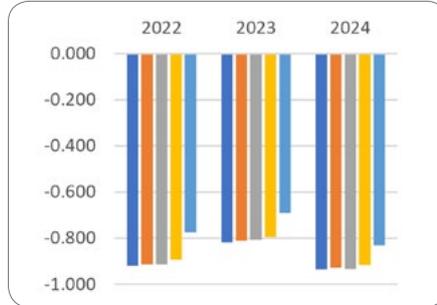


Urban Households

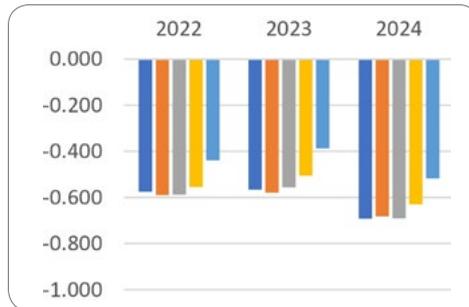


MOZAMBIQUE

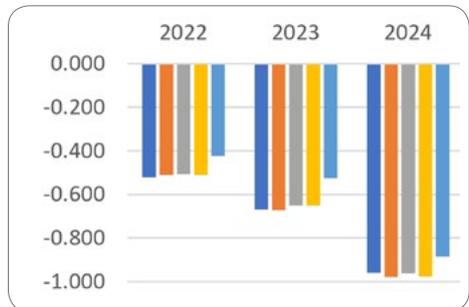
Rural Farm Households



Rural Non-farm Households



Urban Households

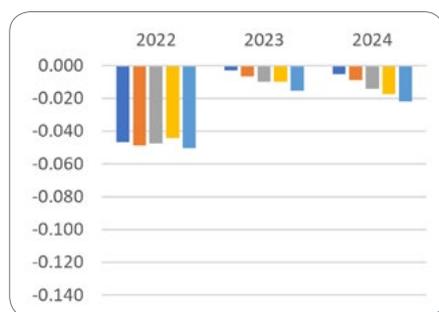


■ Quintile 1 ■ Quintile 2 ■ Quintile 3 ■ Quintile 4 ■ Quintile 5

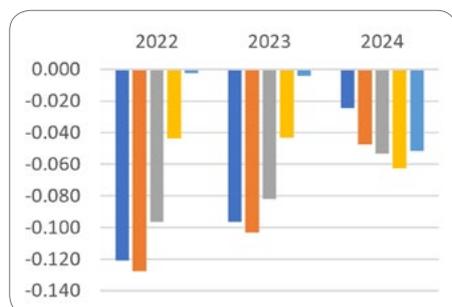
Figures 2b: Changes in Gross Income vs Baseline (%) Continued

UGANDA

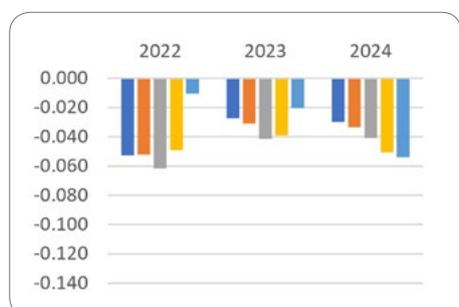
Rural Farm Households



Rural Non-farm Households

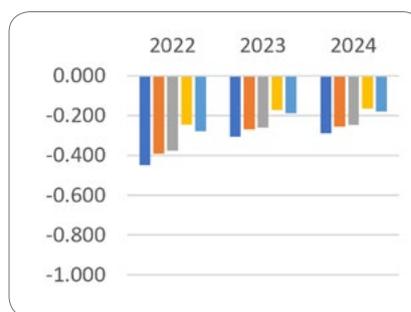


Urban Households

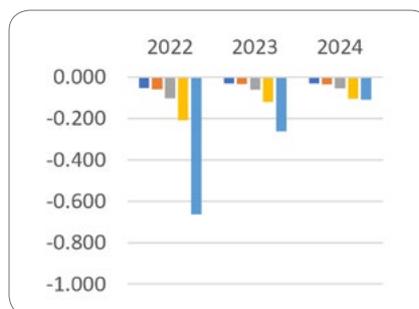


MALAWI

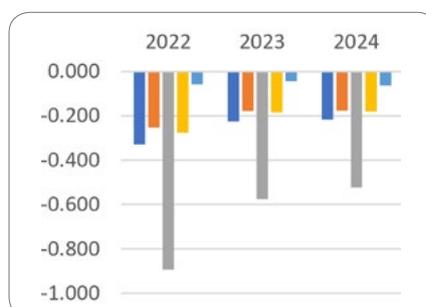
Rural Farm Households



Rural Non-farm Households



Urban Households



■ Quintile 1 ■ Quintile 2 ■ Quintile 3 ■ Quintile 4 ■ Quintile 5

Source: Authors' simulation results

3. Global Wheat Price Increases and Food Inflation

Higher wheat prices will have a significant impact on rising food prices and reduce living standards. This will likely be felt by major wheat importing countries that allocate a higher percentage of their incomes to food. Figures 3a and 3b show that the rise in global wheat prices has triggered a generalized increase in food prices among all countries. The highest food price increases are seen in Malawi and Kenya among both rural and urban households. In contrast, price increases are predicted to be lowest in Nigeria and Uganda among both rural and urban households.

In Nigeria and Tanzania, the higher income households experience greater price increases in their consumption baskets. The opposite is observed in Kenya among both rural and urban households and urban households in Senegal. The overall finding is that prices in 2024 will remain stable at high levels in Kenya while continuing to rise in Senegal and Nigeria for all household groups.

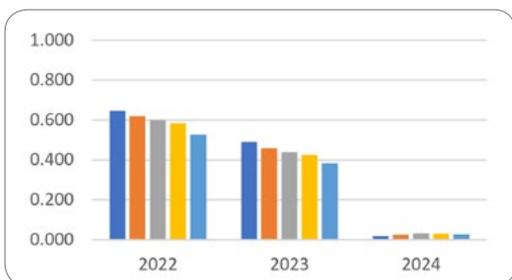
Among countries with disaggregated farm and non-farm rural households (Figures 3b), Ghana, Malawi and Uganda all show a sharp increase in food prices among lower income and non-farm households in rural areas (Figures 3b).

The same pattern of sharp food price increases is observed among urban households in Malawi and Uganda. Ghana's urban areas are the exception as food prices there show a slight decrease of less than half a percentage point. However, most of that decrease occurs among higher income households meaning that the same bias against lower income households also holds. Among rural populations, farm and non-farm households are affected in Ghana, whereas in Mozambique and Malawi, rural non-farm households are more affected than farm households. The opposite is observed in Uganda. Overall, Mozambique and Tanzania (except for the highest income urban households) are the only two countries where prices tend to fall back to pre-war levels in 2024.

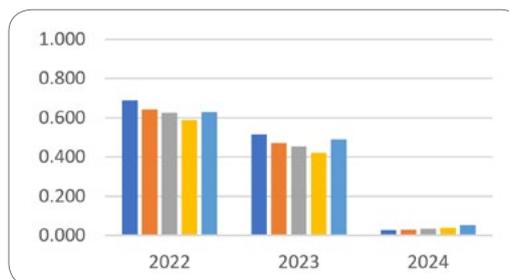
Figures 3a: Changes in Food Price Index vs Baseline (%)

KENYA

Rural Households

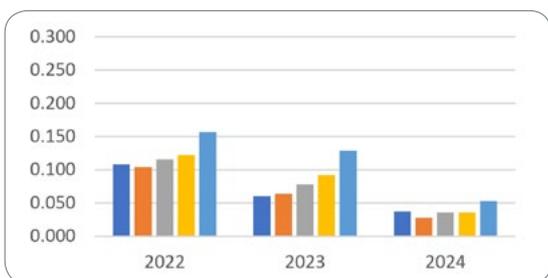


Urban Households

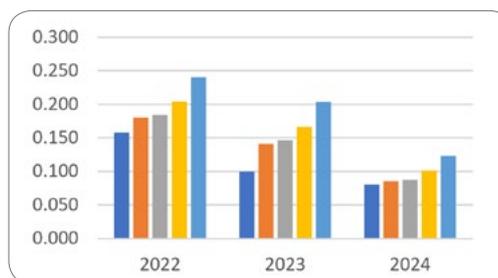


NIGERIA

Rural Households

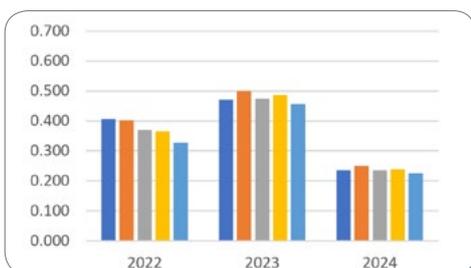


Urban Households

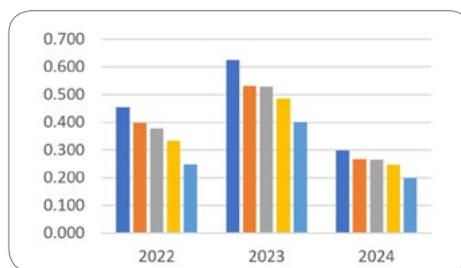


SENEGAL

Rural Households

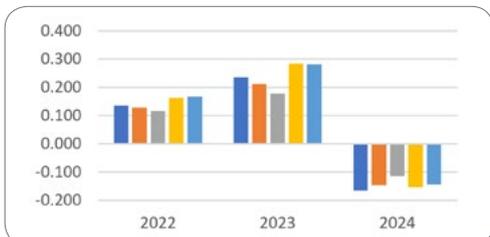


Urban Households

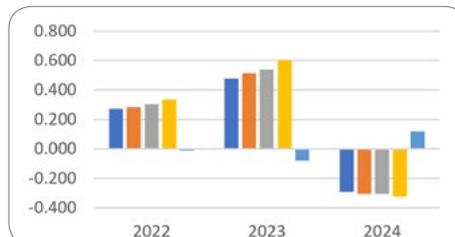


TANZANIA

Rural Households



Urban Households



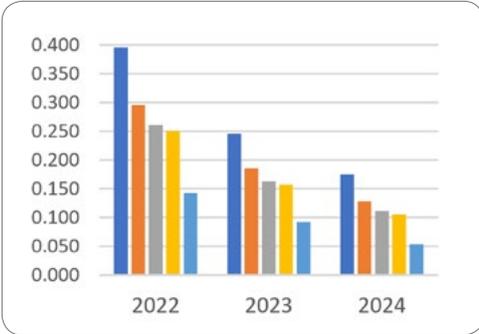
■ Quintile 1 ■ Quintile 2 ■ Quintile 3 ■ Quintile 4 ■ Quintile 5

Source: Authors' simulation results

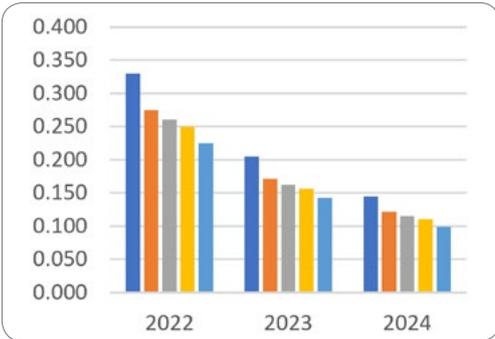
Figures 3b: Food Price Index vs Baseline (%)

GHANA

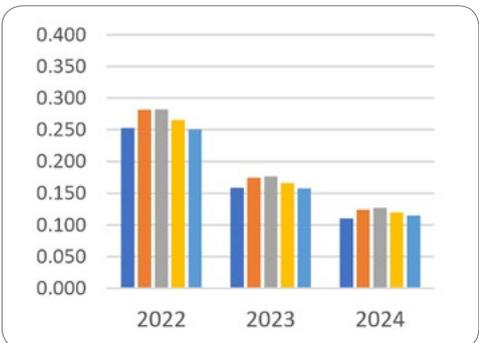
Rural Farm Households



Rural Non-farm Households

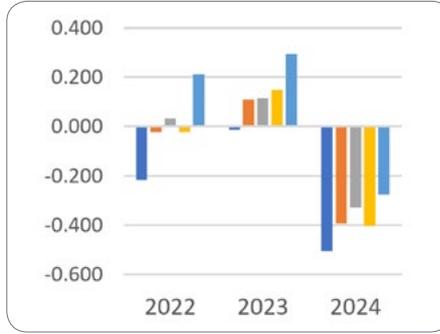


Urban Households

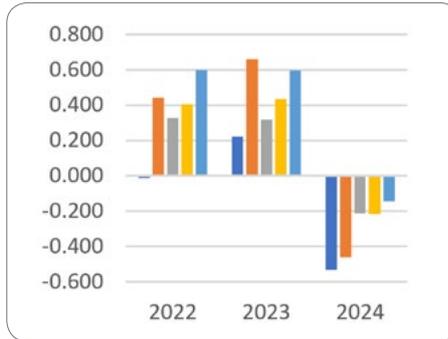


MOZAMBIQUE

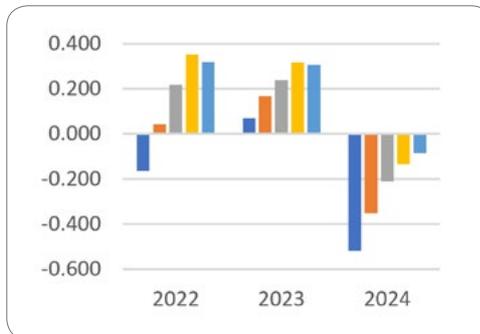
Rural Farm Households



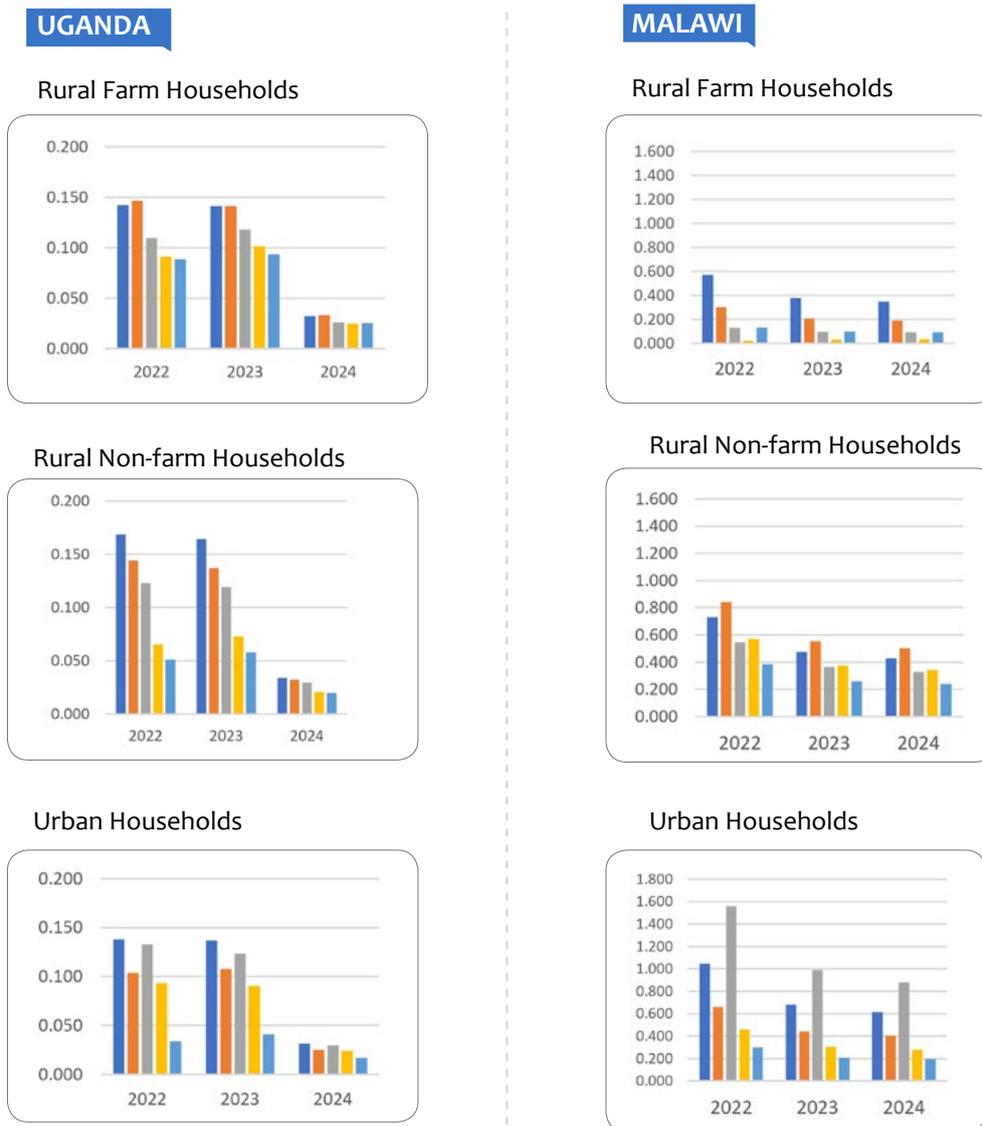
Rural Non-farm Households



Urban Households



Figures 3b: Food Price Index vs Baseline (%) Continued



Source: Authors' simulation results

4. The Impact of Rising Wheat Prices on Food Consumption

The combination of falling incomes and rising food prices discussed in sections 2 and 3 is likely to affect household consumption and trigger a decline in food consumption, particularly among poorer households, both rural and urban (Figures 4a and 4b). Because of differences in consumption baskets and pre-crisis purchasing power, identical or lower price changes may trigger stronger food consumption effects.

Among the first group of countries (Kenya, Nigeria, Senegal, and Tanzania), households across all categories in Kenya experience the greatest drop in food consumption of more than 1.5% (Figures 4a). Senegal, which has the second highest decrease in food consumption, experiences a change of about 0.5%, followed closely by Tanzania in 2022 and 2023. With a change of less than 0.15%, Nigeria experiences the lowest food consumption level decline.

Food consumption estimates also suggest that the categories of affected households depend on their location. In rural Kenya, lower income households will likely experience the largest overall decline in consumption levels. However, among Kenyan urban households, the decline in food consumption is relatively stronger among the top 20%. The same holds true for rural households in Senegal, which face a relatively stronger decline in food consumption compared to their urban neighbors. However, this trend is different for Nigeria, where the decline in food consumption is stronger among urban households than in rural areas, albeit at a modest scale. The picture is a bit mixed in Tanzania, where rural households tend to fare better initially, but then experience continued declines in consumption levels in 2024. In contrast, urban households see a reversal in consumption trends, except for the top income category.

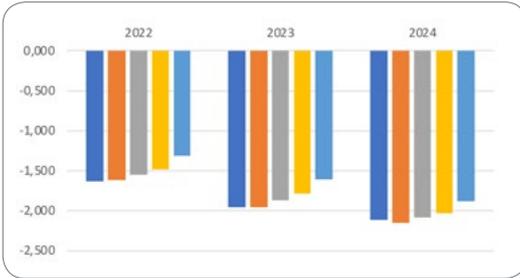
Turning to the second group of countries (Ghana, Mozambique, Uganda, and Malawi), non-farm households in Ghana face a relatively strong decline in food consumption in comparison to farm households (Figures 4b). In contrast, food consumption in the rural areas of Uganda and Malawi decreases more among non-farm than farm households.

The disaggregated results for different household quintiles clearly show that lower income households in Ghana, Malawi, and Uganda tend to suffer the largest declines in food consumption levels. Finally, food consumption levels are shown to recover more by 2024 in the rural areas of Mozambique and Malawi than in the urban areas.

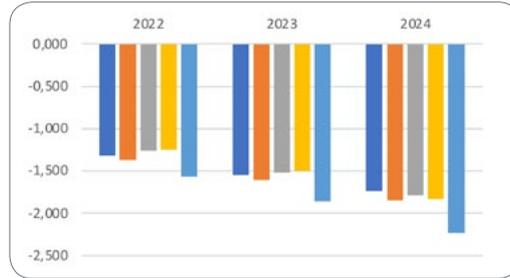
Figures 4a: Changes in Food Consumption vs Baseline (%)

KENYA

Rural Households

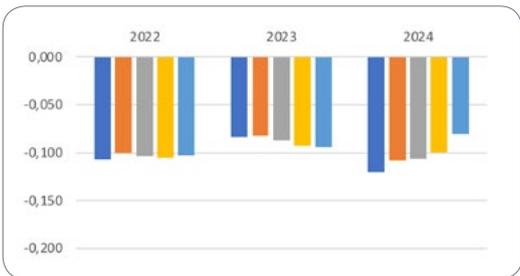


Urban Households

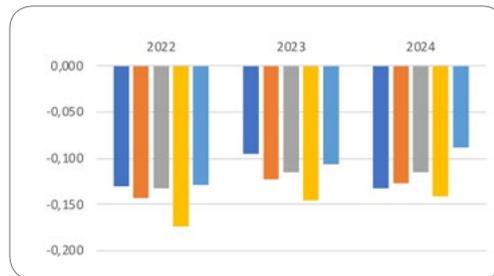


NIGERIA

Rural Households

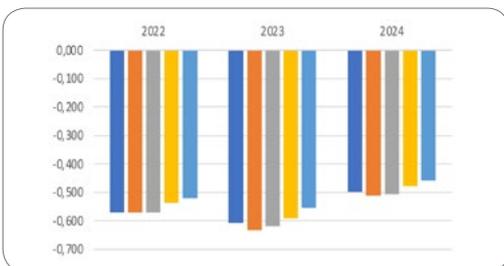


Urban Households

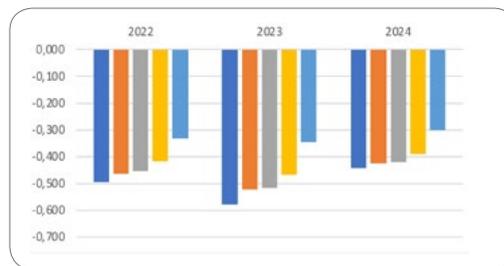


SENEGAL

Rural Households

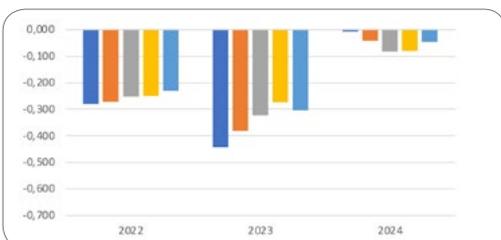


Urban Households

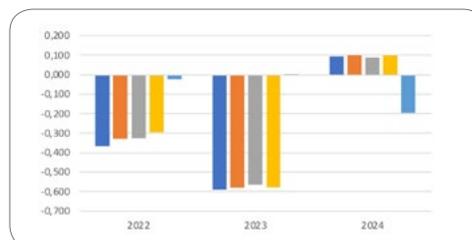


TANZANIA

Rural Households



Urban Households



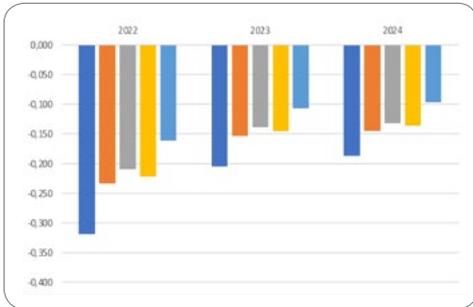
■ Quintile 1 ■ Quintile 2 ■ Quintile 3 ■ Quintile 4 ■ Quintile 5

Source: Authors' simulation results

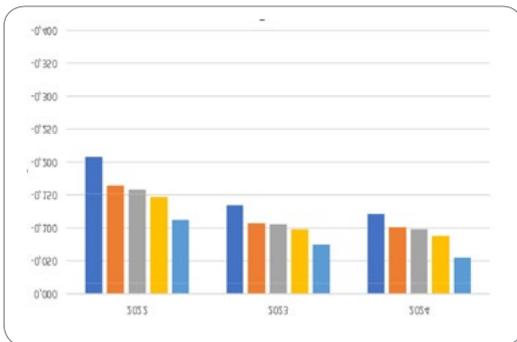
Figures 4b: Changes in Food Consumption vs Baseline (%)

GHANA

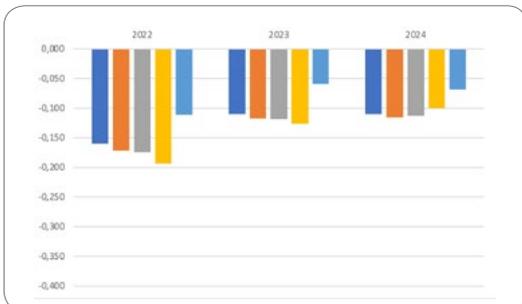
Rural Farm Households



Rural Non-farm Households

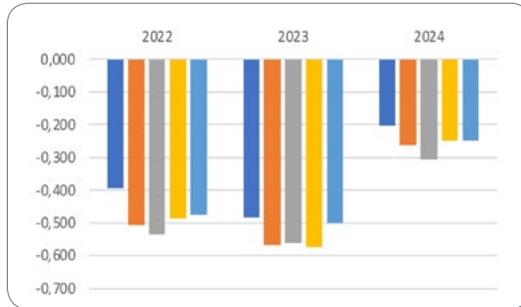


Urban Households

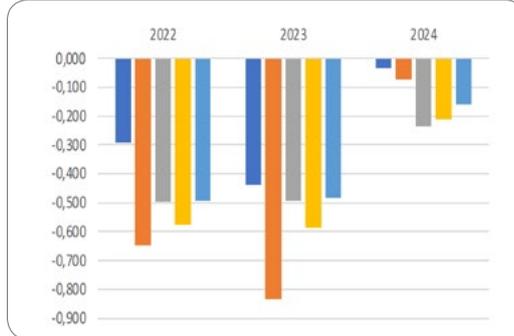


MOZAMBIQUE

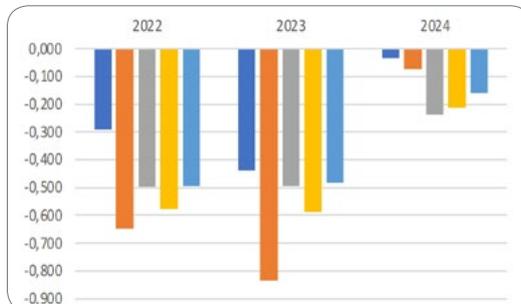
Rural Farm Households



Rural Non-farm Households



Urban Households

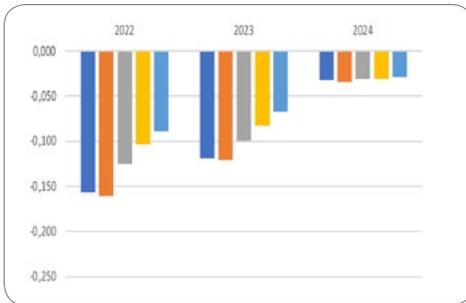


■ Quintile 1 ■ Quintile 2 ■ Quintile 3 ■ Quintile 4 ■ Quintile 5

Figures 4b: Changes in Food Consumption vs Baseline (%) Continued

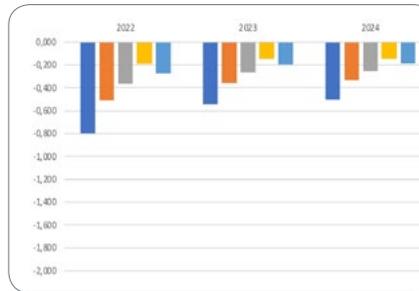
UGANDA

Rural Farm Households

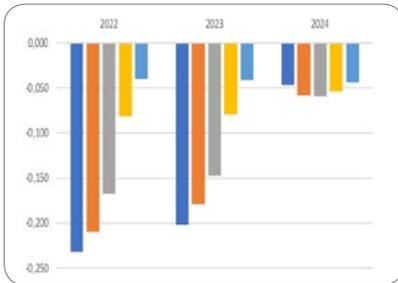


MALAWI

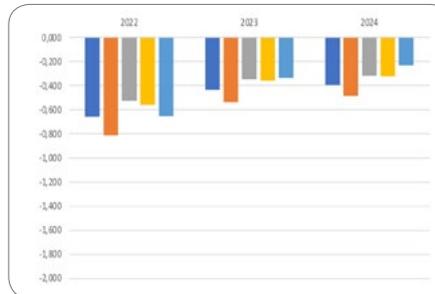
Rural Farm Households



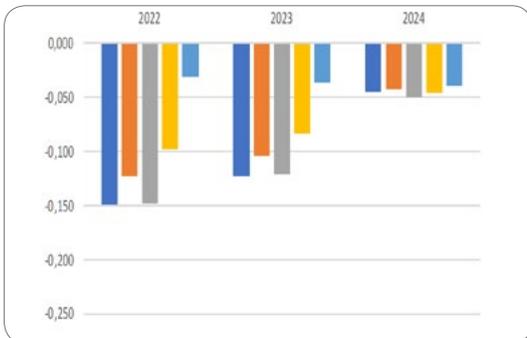
Rural Non-farm Households



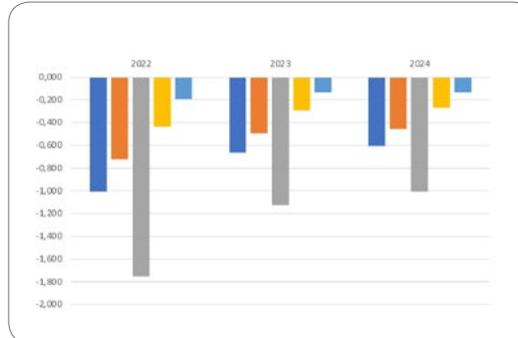
Rural Non-farm Households



Urban Households



Urban Households



■ Quintile 1 ■ Quintile 2 ■ Quintile 3 ■ Quintile 4 ■ Quintile 5

Source: Authors' simulation results

Conclusion

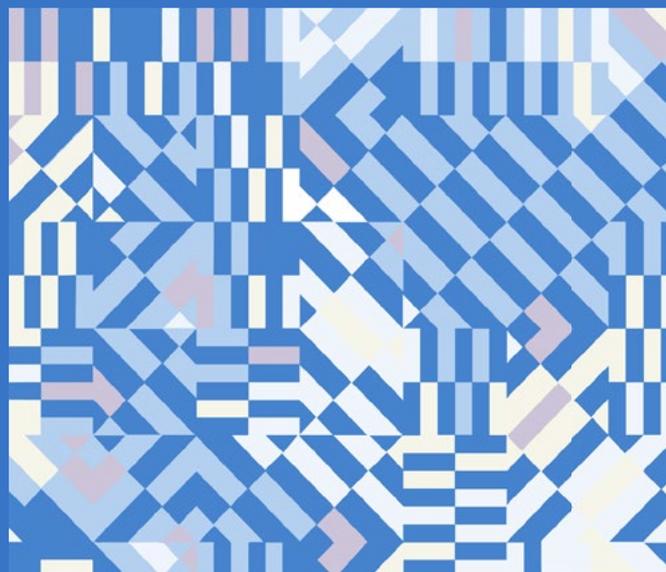
Higher wheat prices are projected to persist through 2024. Given the small size of the wheat production sector in a limited number of African countries, disruption of wheat trade is unlikely to have major macroeconomic ramifications. It is more likely that higher wheat prices will erode purchasing power among the poorest segments of the population and contribute to broader food price inflation. The results indicate negative income effects among rural and urban households across all countries in the sample. Income effects tend to be greater among higher income households and, in rural areas, among farm than non-farm households.

Higher wheat prices have also resulted in generalized food price increases among both urban and rural households across all countries. Unlike income effects, food inflationary pressures tend to be more pronounced among lower income households. This explains the decline in food consumption among rural and urban poor households.

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