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Poverty Impacts of Food Price Increases in Ethiopia

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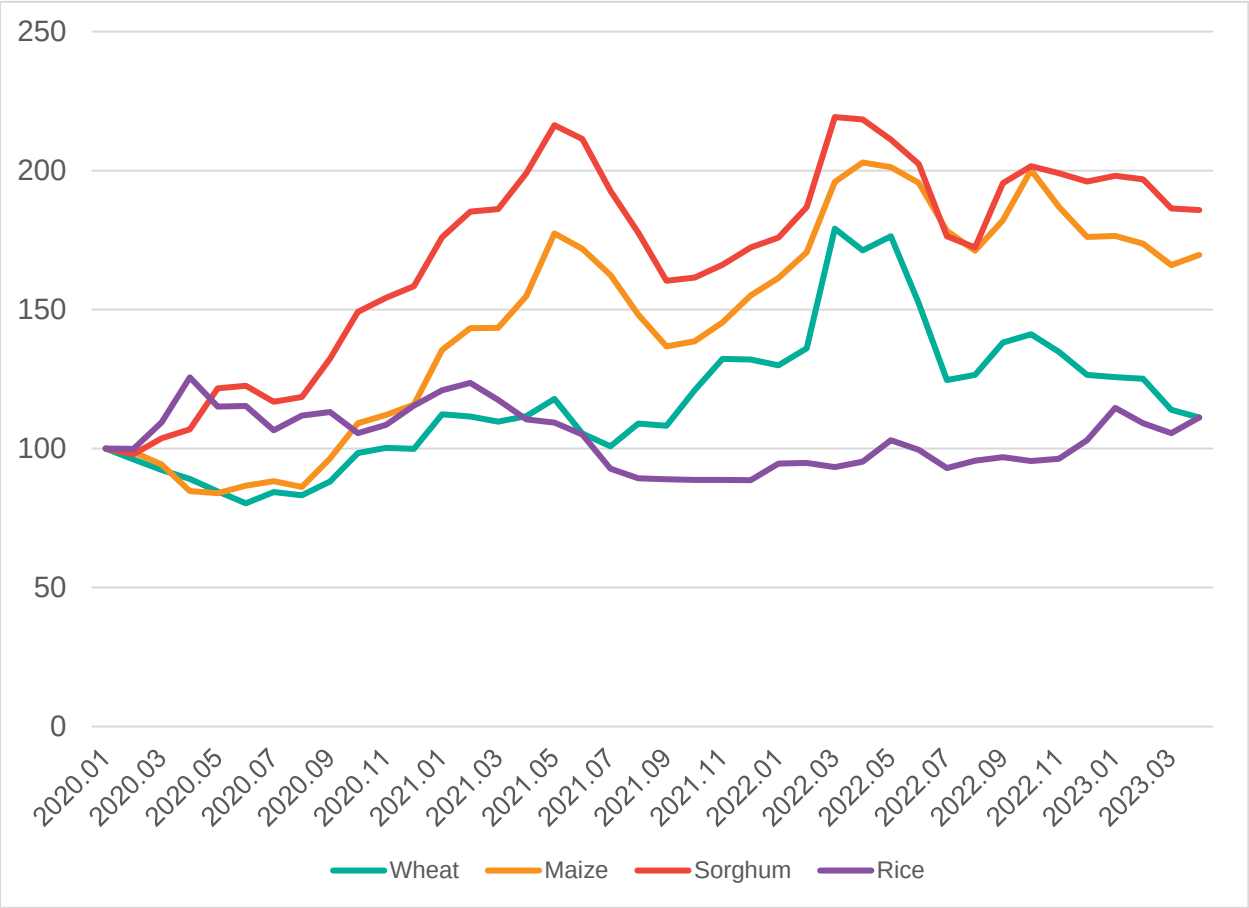
1. Trends in grain prices in Ethiopia

After a long period of relatively stable prices on world markets, the prices of key food staples began to rise from around the beginning of 2020. This period of price increases, spanning the Covid-19 pandemic and then the price shocks following Russia's invasion of Ukraine raised serious concerns about the welfare of poor people in countries such as Ethiopia.

Figure 1. World Grain Price Movements, 2020 to April 2023, Index=100 in January 2020



Notes: Source FAO GIEWS data accessed 3 May 2023. Wheat: US SRW wheat, Gulf Ports; Maize: US #2 Yellow, Gulf; Sorghum, US Export, Gulf; Rice: Thai 5% broken, Bangkok.

Figure 1 shows the movements in the prices of four key grain staples—wheat, maize, sorghum and rice—from the beginning of 2020. As shown in the graph, world prices of maize, sorghum and wheat began to rise at different points during the COVID-19 pandemic. By February 2022, the wheat price was up 36 percent from its level at the beginning of the pandemic, while maize and sorghum prices had risen by 71 and 87 percent. These prices jumped immediately following the Russian invasion of Ukraine, with wheat up roughly 80 percent, maize up 100 percent, and sorghum up 110 percent over January 2000 levels. Rice prices, by contrast, have not moved far from their initial levels.

The surge in the prices of wheat and maize following the invasion of Ukraine reflected concerns that the supply of these grains to world markets from Ukraine and Russia—which together accounted for 25 percent of wheat exports and 15 percent of maize exports—would be sharply restricted. As it became clear that these exports would be much less restricted than originally anticipated, prices of these grains declined from their immediate post-invasion peaks. For the marketing year following the invasion (July 2022 to June 2023), total wheat exports from Russia and Ukraine increased by around 15 percent, with Russia's exports rising by roughly one third and Ukraine's declining by 8 percent[1].

While the higher world prices of recent years created incentives to increase supply and to reduce demand in many markets, these price increases were not passed through into many markets. This, in turn, forced world prices to go higher than otherwise to balance global supply and demand. For

[1] Source: USDA PSD database, https://apps.fas.usda.gov/psdonline/app/index.html#/app/home, accessed 4 May 2023.

wheat, price insulation appears to have roughly doubled the increases in world prices during the COVID pandemic and between February and May 2022 (Martin and Minot 2022).

When assessing the impacts of world prices on the welfare of poor people, it is vitally important to consider the extent of price insulation. Clearly, when world prices rise and domestic prices are insulated against some or all of the price increase, any adverse impacts on vulnerable people are mitigated. But, against that, the collective impact of price insulation is to magnify the increase in world prices, increasing the impact of the original shock to world prices.

2. Impacts of Price Changes on Poverty in Ethiopia

A key determinant of the importance of a staple food is its share of total calorie consumption. Foods that contribute only a trivial share of calorie consumption are unlikely to have a major impact on the economic welfare or food security of poor people, even if their prices change dramatically. This share is shown in Table 1 for each of the key internationally-traded staples whose price rose sharply during the COVID and Ukraine crises. This Table reveals that the calorie share for maize is much higher than for wheat or sorghum in Ethiopia. The share in the table is an average across all households, with the share of calories from these basic staples likely to be much larger for households near the poverty line than for the average.

As shown by Deaton (1989) the importance of a staple food in the diet is not the only factor that determines the impact of a price change in a country where subsistence production is important. Rather, what matters is the difference between the share of the good in total income and its share in total expenditure—the so-called Net Benefit Ratio (NBR) for the food. Table 1 shows that the share of household income from maize is much smaller than the share of expenditure for each staple food. The NBR as a percentage of initial income is much larger in absolute value for maize (at 4.4 percent) than it is for wheat (1.9 percent) and for Sorghum (1.6 percent). These results show that average household real incomes are likely to fall by 0.4 percent for a 10 percent increase in the price of maize, by 0.2 percent for wheat and 0.16 percent for sorghum.

Table 1. Importance of selected commodities in caloric intake, income, and expenditure: Ethiopia

	Calorie share of diets (%)	Budget shares		
		Income share (%)	Expend-iture share (%)	Net benefit ratio (%)
Maize	21.2	1.5	5.9	-4.4
Wheat	13.3	1.6	3.5	-1.9
Sorghum	9.6	1.1	2.7	-1.6

Sources: Caloric contribution from FAO Food Balance Sheets, 2021 (FAO, 2023). Budget shares as a percentage of total expenditure from the Povana database (Mamun and Laborde, 2021). Includes derived products such as flour and bread

What matters for household incomes in Ethiopia is not changes in world prices, but rather the changes in domestic prices. Table 2 presents the changes in world and in domestic prices relative to January 2020 prices. Because inflation rates in Ethiopia were high over this period, increases in nominal prices would tend to overstate the impact of world price increases on the real economic welfare of Ethiopian people. For this reason, the domestic price changes are presented in real as well as nominal terms, where real prices are adjusted for inflation using the Ethiopian consumer price index.

Table 2 shows dramatic differences between the three prices reported for each commodity. For example, the 30 percent increase in wheat prices prior to the Ukraine invasion is associated with an 18 percent increase in real domestic prices. The further 46 percentage point increase in world wheat prices to May 2022 has no apparent impact on domestic prices, which remain 18 percent above the 2020 price. The sharp decline in wheat prices to July 2022 is not reflected in the domestic price index, which rose to 127 in July 2022. The real domestic price for maize increased by 51 percent, close to the 61 percent increase in world prices during the COVID period. The sharp arise in world prices following the Ukraine invasion was associated with a decline in domestic prices, while the decline in world prices to July 2022 was associated with a sharp increase in domestic maize prices. Finally, the real price of sorghum was much less volatile than world prices and again moved inversely with the rise and fall of world prices following the Ukraine invasion.

Table 2. International and domestic cereal prices

		Price index (100 = February 2020)			
Commodity	Price type	Pre-Covid (Feb 2020)	Pre-invasion (Jan 2022)	Peak (May 2022)	Post-peak (July 2022)
	World (US$)	100	130	176	125
Wheat	Local nominal	100	189	213	240
	Local real	100	118	118	127
	World (US$)	100	161	201	178
Maize	Local nominal	100	243	262	323
	Local real	100	151	145	163
	World (US$)	100	205	229	190
Sorghum	Local nominal	100	179	117	207
	Local real	100	111	98	109

Source: All prices from FAO-GIEWS except Sorghum World price from IMF

The differences between movements in domestic and world prices are particularly striking. For wheat, Ethiopia was a consistent importer over the period, so the smaller increase in domestic prices does not appear to have been a consequence of shifts between import and export status that—combined with substantial transport and port costs—might be expected to result in quite different behavior of domestic and world prices. While protection to wheat was consistently negative during the 2005 to 2011 period, it was positive between 2012 and 2019, with a protection rate of 36 percent in 2019 (AgIncentives 2023). USDA (2022 p2) notes that elimination of tariffs and other taxes on wheat during the 2021-22 harvest season would have lowered domestic wheat prices, although the tariff itself was only 5 percent.

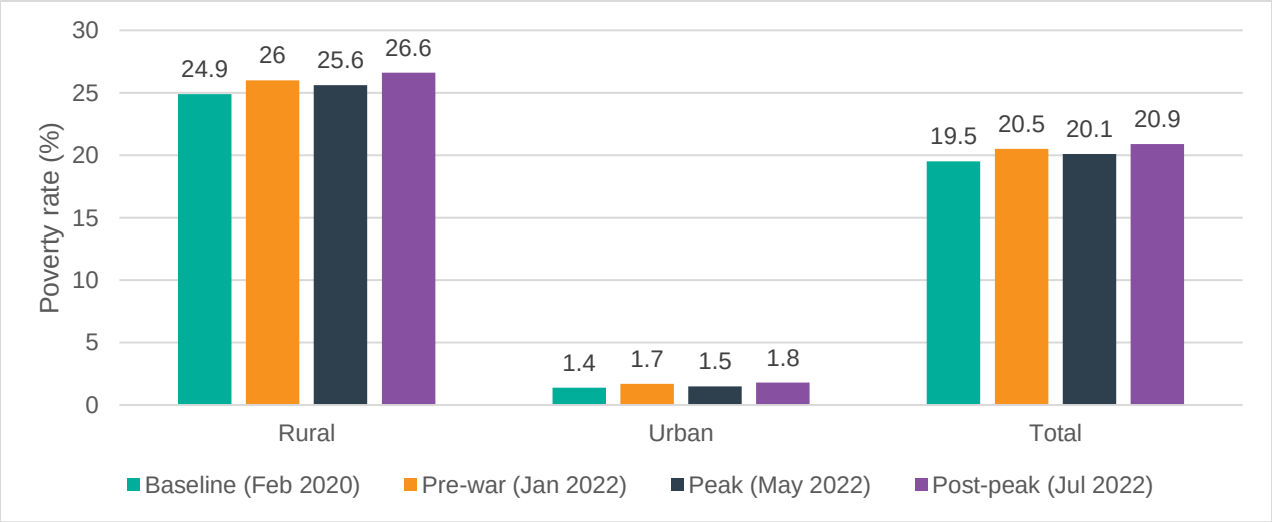
For maize, USDA (2022) believes that Ethiopia has the potential to export white maize to the East Africa region, but that development of this potential has been hampered by export bans since 2008. The AgIncentives (2023) estimate for the average rate of protection to maize for 2005 to 2019 is -64 percent. Demeke (2012) concludes that maize prices are held down by a combination of export bans, an overvalued exchange rate that lowers returns to exporting, and import of subsidized food aid in periods of domestic shortage. While these policies succeed in keeping domestic prices well below world market levels, shocks to output like the fall of over 10 percent between 2000 and 2001 that can lead to price volatility of the type seen in 2022. The coefficient of variation (CV) for the farm price of maize in USD is 0.30 over the 2005-19 period covered by AgIncentives (2023), above 0.26 for the external reference price.

High trade costs create a large gap between import and export prices for sorghum and contribute to strong insulation from changes in world prices. The average nominal rate of protection for sorghum is modestly positive for 2005-2019 at 6.5 percent (AgIncentives 2023). In contrast with the case of maize, the CV for the farm gate price, at 0.33, is well below that for the external reference price of 0.42.

Figure 2 compares poverty rates at baseline prices with those for the three key time periods considered in the analysis. We focus on the changes in real prices because the inflation rate was high in Ethiopia during this period and changes in the nominal price of an individual commodity are only a reliable guide to welfare impacts when all other prices are unchanging. We focus only on the period between February 2020 and July 2022 because that is the period in which the prices of staple foods changed most dramatically. As seen in Figure 1, world prices of wheat, maize and sorghum have remained in the same broad range as in July 2022 through early 2023.

Clearly, given our sample period and assumptions, poverty rates are much higher and increase much more in percentage point terms in rural than in urban areas, with poverty rising from 24.9 percent to 26.6 percent at July 2022 prices. Because the poverty rate is so much lower in urban areas, the share of people vulnerable to falling into poverty is much smaller than in rural areas, although the proportional increase in the poverty rate is much higher, with the poverty rate increasing by 28 percent from its initial level. Almost all the poverty increase is due to increases in the real price of maize, which both had the largest price increases and the greatest leverage on the poverty rate because of its relatively large adverse Net Benefit Ratio.

Figure 2. Impacts of commodity price changes on poverty



Source: Authors' calculations based on changes in real prices of maize, wheat, and sorghum and household income and expenditure patterns from the Povana database.

3. Sensitivity Analyses

Key questions about the results are the extent to which the insulation of Ethiopia's domestic markets from the increase in world prices helped to reduce poverty impacts, and how large the estimated impacts would have been had we ignored the inflation in Ethiopia that raised average prices[2] by 60 percent from January 2020 levels by January 2023 and doubled them by July 2022.

To address these questions, Figure 3 compares the poverty increases estimated using real price rises with those had domestic prices moved in line with world prices and those obtained using nominal price increases of maize, wheat, and sorghum. The results show that the increases in poverty would have been much larger in each of the three periods considered had domestic prices moved in line with world prices and particularly at the peak of the post-Ukraine price surge in May of 2022. The increase of over five percentage points under that scenario shows the potentially dramatic impacts of higher prices of these staple foods on poverty in a country like Ethiopia. Most of the increases in poverty are due to the rise in maize prices, with sorghum and wheat price rises playing a

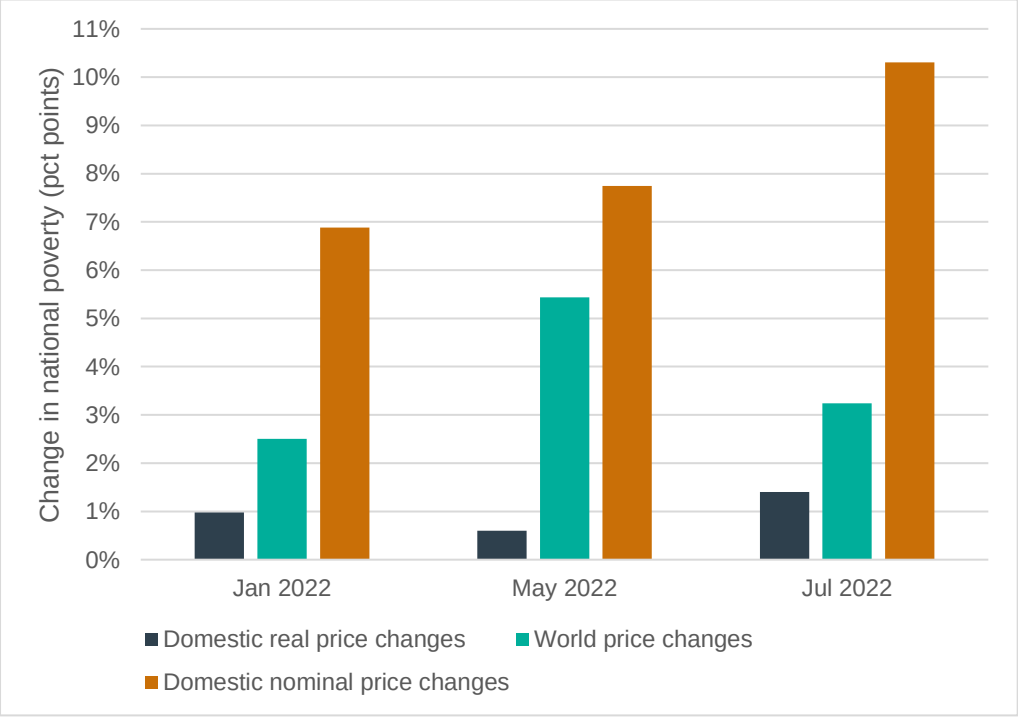
[2] Trading Economics. https://tradingeconomics.com. Accessed 24 May 2023.

much smaller role. Even with the much more modest increases in domestic prices actually experienced, the rise in poverty of 1.4 percentage points is cause for concern.

The results in Figure 3 also show that the estimated poverty impacts would have been dramatically larger had we used the nominal increases in domestic prices for these goods. This would have been particularly the case by July 2022, with a poverty increase of over ten percentage points. With inflation running at such high rates in Ethiopia, however, the assumption that all other prices are constant implicit in using the nominal price impacts alone seems quite tenuous.

The benefits to many vulnerable Ethiopian households of the smaller increases in real food prices associated with low transmission of changes in world prices are clearly substantial in this case. But this should not automatically lead to endorsement of price insulation as a policy for developing countries more generally. Insulating domestic markets from international price shocks increases the size of the international price change necessary to balance supply and demand. Based on results by Martin and Minot (2022), around half the increase in world wheat prices following the Ukraine invasion came from countries insulating their markets against increases in world prices. While attractive to countries individually, it is collectively ineffective in reducing poverty impacts because it raises the world prices that are the source of concern to countries using this type of policy. Only those countries that insulate to a greater than average extent can expect to face smaller price increases than they would if all countries refrained from price insulation (Anderson, Martin and Ivanic 2017).

Figure 3. Sensitivity of Poverty Impacts of Food Price Rises to Different Assumptions



Notes: The first bars in each set refer to the estimates based on real price changes. The second bars refer to poverty impacts using world price changes. The third bar in each set refers to the results obtained using nominal price changes.

4. Conclusions

The analyses presented in this brief highlight some important points. The first is that world prices of key staple foods such as maize, wheat and sorghum can be extremely volatile, with sharp but often short-lived increases in prices having particularly dramatic impacts. With household survey data that

are now widely available, it is possible to assess the short-run impacts of price changes on household incomes, and hence on poverty rates using simple, robust techniques.

In Ethiopia, as in many other developing countries, net purchases of staple grains by households exceed net sales for many households, sometimes by a substantial margin. This, and the importance of these foods as sources of calories contribute to a situation in which the short-run impact of higher prices on poverty can be substantial. However, it may be quite misleading to assume that domestic prices will move in line with world prices. In Ethiopia, domestic wheat prices rose much less than world prices during the Covid pandemic and the surge in prices following the invasion of Ukraine and only caught up when world prices declined following the signing of the Black Sea grain agreement. The price of maize—the staple with the greatest impact on poverty rates in Ethiopia—rose by considerably less than the rise in world prices throughout. The price of sorghum remained relatively stable around its level at the beginning of the Covid-19 pandemic.

The price insulation in Ethiopia—resulting from a combination of high transport margins and policy intervention—appears to have substantially reduced the substantial (over five percentage points) increase in poverty rates that would have occurred with full price transmission at the peak of the Ukraine crisis. It should be remembered, however, that a substantial share of the increase in world prices resulted from the widespread practice of price insulation.

This study is part of a series of case studies that IFPRI is undertaking to assess the impact of higher commodity prices on income and poverty in developing countries. The analysis presented is an initial impact assessment designed to estimate the impact of higher food prices on poverty in selected countries. The initial set of case studies covers Ethiopia, Kenya, Nigeria, Niger, Burkina Faso, and Mali. The analysis may be extended to cover other countries in the future.

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