

COUNTRY BRIEF 21

Poverty Impacts of Food Price Increases in Burkina Faso

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The prices of many agricultural commodities, including many staple grains, started to increase in mid-2020 partly due to supply chain bottlenecks associated with the outbreak of Covid-19. The invasion of Ukraine by Russia in February 2022 caused an additional spike in commodity prices, particularly wheat and maize. This brief estimates the impact of these price increases on poverty in Burkina Faso. It is part of a series of six such briefs that estimate the poverty impact of higher world prices for staple grains. The other briefs cover Kenya, Ethiopia, Niger, Nigeria, and Mali (see Minot and Martin, 2023a and 2023b; Martin and Minot, 2023a, 2023b, and 2023c).

We use the same approach in all six country studies. The analysis starts by exploring the effect of the rise in international grain prices on the real price of selected grains in the domestic markets of the country. Next, we estimate the impact of the changes in domestic grain prices on the real income of each household in a nationally representative survey, taking into account the importance of the commodities in consumption and as a source of income for each household. Finally, changes in headcount poverty (the share of people living below the poverty line) are estimated based on the changes in real income for each household in the sample. We focus on the prices of maize, wheat, and sorghum for reasons discussed below. The methods are described in more detail in a method brief.

1. Trends in international grain prices

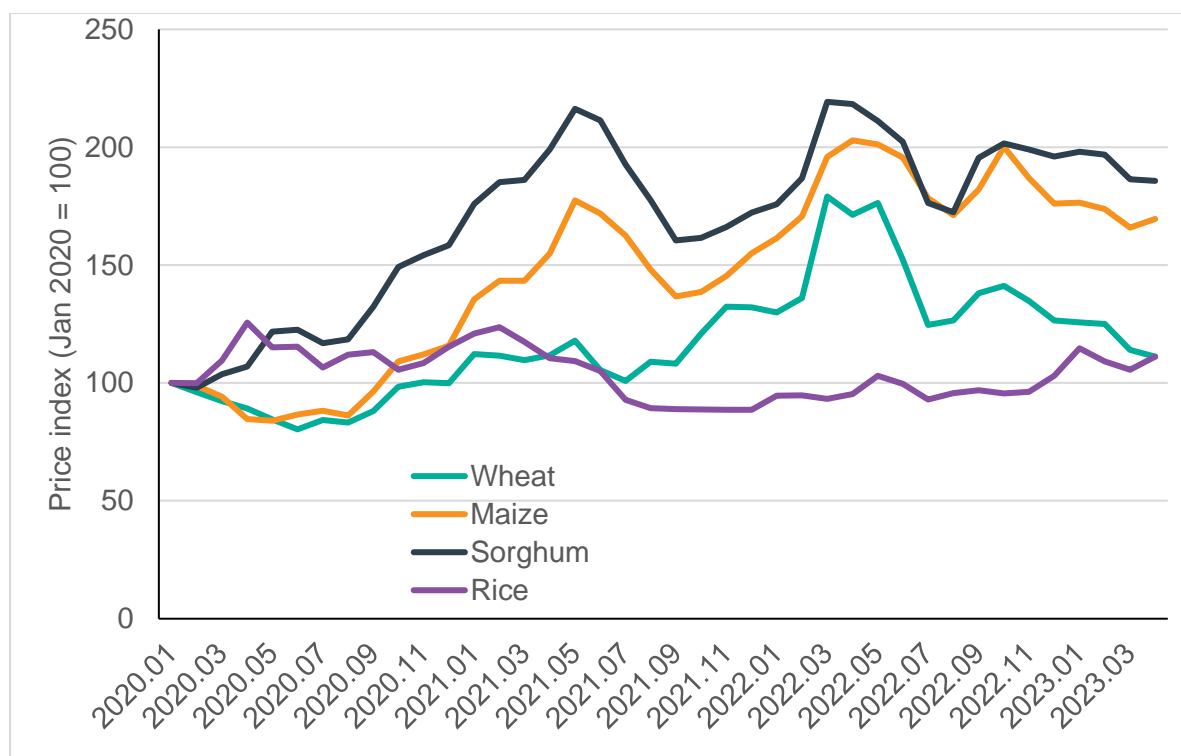
After several years of relative stability, commodity prices began to increase in mid-2020 in the wake of the Covid-19 epidemic, although the pattern and timing differed across commodities. Figure 1 shows trends for reference prices of wheat, maize, sorghum, and rice in exporting countries. The price of US soft red winter wheat fell somewhat in the first half of 2020, but then rose fairly steadily over the next 18 months. By February 2022, it was 36 percent above the pre-pandemic level. The next month, in response to the invasion of Ukraine by Russia, the wheat price spiked to 79 percent above the pre-pandemic level because of fears that the war would impede exports from both countries. The two countries together account for 25 percent of global wheat exports. Wheat prices remained high for several months but began to decline in June 2022, as it became apparent that war-related restrictions on grain exports would be less than feared. By April 2023, the international price of wheat was just 11 percent above the pre-pandemic level.

Maize prices, represented by US No. 2 yellow maize, followed a similar pattern, though the increase was greater. As shown in Figure 1, the maize price spiked once in May 2021 at 77 percent above the pre-pandemic level and again after the invasion of Ukraine, when it reached double the pre-pandemic price. Unlike the wheat price, the maize price has remained high. As of April 2023, the maize price was still 70 percent above the pre-pandemic level.

The international price of sorghum rose even more than wheat or maize, reaching 116 percent above the pre-pandemic price in May 2021 and again in March 2022 following the invasion. Although the price has declined somewhat since then, in April 2023 it was still 86 percent above the pre-pandemic price. Russia and Ukraine are not important exporters of sorghum, but sorghum prices typically follow maize prices because they are close substitutes as animal feed.

Somewhat surprisingly, the price of Thai 5% broken rice has remained relatively stable throughout the Covid-19 pandemic and during the war in Ukraine. The war has had little effect on the production or trade of rice in world markets, much of which is centered on Asia. Rice prices began to increase somewhat in early 2023 but were just 11 percent above the pre-pandemic level in April 2023.

Figure 1: World prices of selected grains



Source: FAO Global Information and Early Warning System. FAO (2023).

Note: Wheat prices are for US soft red winter wheat. Maize prices are for US No. 2 yellow maize. Sorghum is represented by US sorghum prices at Gulf Ports. Rice prices are for Thai 5% broken rice.

2. Grain prices in Burkina Faso

International grain prices only matter to households in developing countries to the extent that they affect domestic markets and the prices faced by farmers and consumers in the country. Thus, the question is: how much of the shocks in international markets are transmitted to domestic grain markets in Burkina Faso? With no change in international prices, we would expect domestic prices to rise at the rate of inflation in the country. An increase in international prices should cause domestic

prices to rise faster than inflation; in other words, it should cause the real (inflation-adjusted) domestic price to rise. Econometric analysis suggests that shocks in international food prices are frequently not fully transmitted to domestic markets (Minot, 2011; Ceballos et al., 2017). There are several possible explanations for this pattern. First, if the marketing margin between international and domestic prices is fixed in monetary terms, the domestic prices in an importing country (which are generally higher than international prices) will rise by a smaller percentage than the international price. Second, local and imported grains may be somewhat different to consumers, making them imperfect substitutes for each other. Third, the government may reduce protection rates when world prices increase and increase protection rates when they fall, thus partially insulating domestic consumers from the full shock (Martin and Minot, 2022). Conversely, domestic prices may move independently of world price changes if there is little or no trade in the commodity.

Table 1 shows the changes in the world price (expressed in US\$), local nominal prices, and the local real price for three staple grains: wheat, maize, and sorghum. Rice is not included in the analysis because international prices have been relatively stable. We focus on four time periods: February 2020 (pre-pandemic), January 2022 (pre-invasion), May 2022 (peak international prices), and July 2022 (post-peak). We do not analyze price changes between July 2022 and early 2023 because, as shown in Figure 1, the world prices of wheat, maize, and sorghum in the second quarter of 2023 have remained in the same broad range as they were in July 2022.

Table 1. International and domestic cereal prices in Burkina Faso

Commodity	Price type	Price index (100 = February 2020)				Price transmission ratio
		Pre-Covid (Feb 2020)	Pre-invasion (Jan 2022)	Peak (May 2022)	Post-peak (July 2022)	
Wheat	World (US\$)	100	130	176	125	--
	Local nominal	100	114	114	114	--
	Local real	100	104	93	91	-38%
Maize	World (US\$)	100	161	201	178	--
	Local nominal	100	161	220	215	--
	Local real	100	146	179	170	89%
Sorghum	World (US\$)	100	205	229	190	--
	Local nominal	100	179	238	263	--
	Local real	100	162	193	207	120%

Source: IMF (2022) for international sorghum price. FAO (2022a) for others. The world prices are the US soft red winter wheat price, the US No 2 yellow maize price, and the US price of sorghum, Gulf Ports. The local prices are the retail price of wheat flour in Mopti, Mali, the retail price of white maize in Ouagadougou, and the wholesale price of sorghum in Ouagadougou.

Between February 2020 and May 2022, when international prices peaked, the world price of wheat rose 76 percent, before falling back somewhat, remaining 25 percent above the pre-pandemic price. Because wheat prices are not available for Burkina Faso¹, we use the retail price of flour in Mopti, Mali (near the border with Burkina Faso). Over this period, the nominal price of wheat flour in Mali was relatively stable at 400 FCFA/kg, almost certainly an administratively set price. But a key question is whether it reflects prices at which flour is available in Burkina Faso. Although we do not have monthly data on flour prices in Burkina Faso, press reports suggest that prices were fixed there as well. In May 2022, bakers in Burkina Faso went on strike to protest the fact that the government was maintaining the controlled price of 150 FCFA/loaf despite rising wheat and flour prices.

The federation [of bakeries] accused the authorities of violently closing down some bakeries in the capital Ouagadougou, which had raised the price of bread from 150 FCFA (\$0.22) to 200 FCFA (\$0.32) against the government's directive not to increase prices... Nina Sori, secretary-general of the federation, said they had

¹ We checked the price databases maintained by the FAO, FEWSNET, and WFP, as well as a general web search.

no other option but to stop work. “While we are told not to increase the price of bread, the price of flour is skyrocketing. ... It is unsustainable.” (Tasamba, 2022)

Assuming that bread prices in Burkina Faso followed the same trend as those in Mopti, Mali, this implies that the real price of wheat products fell by 9 percent between February 2020 and July 2022. Since world prices rose and domestic real prices fell, the price transmission ratio is negative.

International prices of maize and sorghum more than doubled between February 2020 and May 2022 before receding somewhat in July 2022. The nominal domestic prices of sorghum roughly doubled between February 2020 and July 2022, reflecting the impact of both domestic inflation and the rise in world prices. However, the real (inflation-adjusted) domestic prices of maize and sorghum rose by 70 percent and 107 percent over the whole period. The price transmission ratio was 89 percent for maize and 120 percent for sorghum, reflecting incomplete transmission for maize and somewhat more than full transmission for sorghum. Burkina Faso is essentially self-sufficient in both commodities, importing less than 2 percent of domestic requirements. However, the higher price of maize and sorghum may be partly related to domestic factors. For example, both maize and sorghum production fell in 2021-22 compared to the year before (USDA, 2023).

3. Income and spending patterns

This section looks at how staple food price changes affect household income, which varies across households depending on the importance of the commodity as a source of income and its share in the household budget. Households that produce and sell the commodity gain from higher prices, while those that are net buyers of the commodity lose. The percentage change in income will be proportional to the magnitude of the price change and the net sales of the commodity (positive or negative) as a share of income (Deaton, 1989).

The first column of Table 2 shows the importance of maize, wheat, and sorghum in the diet of households in Burkina Faso. Maize is the most important food, contributing 19.3 percent of the caloric intake on average. Sorghum is the second most important food item, representing 14.3 percent of the total. Wheat is considerably less important, accounting for just 3.6 percent. In fact, several other food items are more important than wheat in caloric terms, including millet, rice, pulses, and groundnuts. Nonetheless, wheat products are more important in urban areas, which partly explains the political sensitivity surrounding bread prices.

Table 2. Importance of selected commodities in caloric intake, income, and expenditure in Burkina Faso

	Caloric contribution to the diet (%)	Budget shares		
		Income share (%)	Expenditure share (%)	Net benefit ratio (%)
Maize	19.3	2.8	4.9	-2.1
Wheat	3.6	0.0	0.0	-0.0
Sorghum	14.3	0.0	1.9	-1.9

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

The second and third columns give the share of income derived from the commodity and the share of expenditure allocated to it, including cash transactions and home production. The last column

gives the net benefit ratio, defined as the income share minus the expenditure share, that is, net sales as a proportion of total household expenditure. As Deaton (1989) noted, the net benefit ratio for a commodity can be interpreted as the short-run elasticity of real income with respect to changes in the price of the commodity.

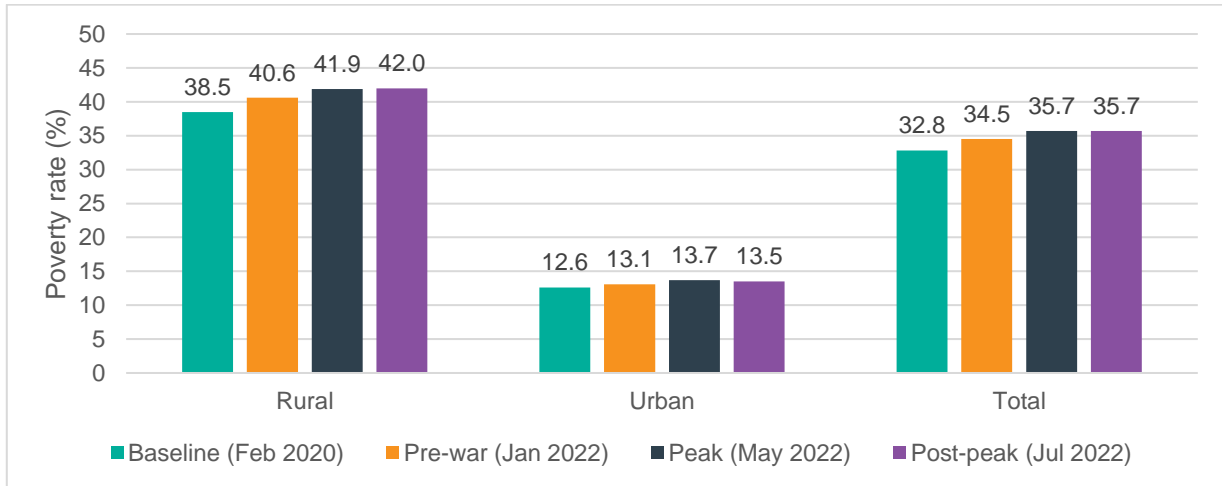
Maize and sorghum show net purchases, which is difficult to reconcile with the fact that trade statistics show negligible imports of the two commodities. This may reflect cross-border trade that is not recorded in trade data. Wheat also shows small net purchases, which is understandable given that the country imports more than 90 percent of its wheat needs. If anything, the expenditure share of wheat products may be somewhat underestimated given the importance of wheat in caloric intake.

4. Poverty impact of grain price increases

In this section, we simulate the impact of staple food price changes on headcount poverty in Burkina Faso. The analysis uses the real price changes of maize, wheat, and sorghum in domestic markets over the period February 2020 to July 2022, combined with information about the income and expenditure patterns of each household in a nationally-representative survey of Burkina Faso. We use the real (inflation-adjusted) price changes to capture the impact of the rise in grain prices relative to the domestic prices of other goods. This analysis does not include the welfare impact of domestic inflation, which is beyond the scope of this analysis. Such an analysis is complicated because it depends on which prices and income rise with inflation (such agricultural prices) and which tend to lag behind inflation (such as formal-sector wages) tend to lag behind inflation. The results for real price impacts are shown below in Figure 2.

Overall, the simulations indicate that the higher prices for maize, wheat, and sorghum increase the poverty rate in Burkina Faso. The national poverty rate is 32.8 percent in the base period, before the Covid-19 epidemic. In the simulation, the share of the population below the poverty line rises to 35.7 percent at the peak of international grain prices in May 2022 and remains at the level in July 2022, after world prices have begun to decline. Of course, some net surplus farmers gain from the higher prices and may escape poverty, but there are more net buyer households who lose from the higher prices. Since the population of Burkina Faso is 22 million, this implies that the higher prices of these three staple grains has a net effect of increasing by 600 thousand the number of poor people in Burkina Faso.

Figure 2. Impact of staple grain price changes on poverty in Burkina Faso



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

The urban poverty rate is much lower, 12.6 percent in the base period, but it also rises, reaching 13.5 percent in the post-peak period (July 2022). In rural areas, the poverty rate rises from 38.5 percent in the base period to 42.0 percent in the post-peak period, a 3.5 percentage point increase. In urban areas, almost all households are net buyers of these staple grains, meaning their real income declines due to the higher prices. However, the impact on urban poverty is dampened by two factors. First, urban incomes are higher, so the share of urban budgets allocated to food (particularly staple grains) is smaller, which reduces the income effect of the price increases. In addition, fewer urban households are near the poverty line and thus at risk of being pushed below it by the higher prices. Although rural households include some that gain and others that lose, the net effect on poverty is larger than in urban areas because staple grains are a larger part of their budgets and because more of them are near the poverty line.

5. Sensitivity of results to alternative assumptions

In this section, we compare the main results from Figure 2 with the poverty impact under two alternative assumptions. Specifically, we estimate the impact on poverty 1) if the world price shocks in the three commodities had been fully transmitted to domestic markets and 2) if we included both the increase in the real price and the price increase due to inflation for the three commodities, while also assuming that other prices and income are fixed in nominal terms.

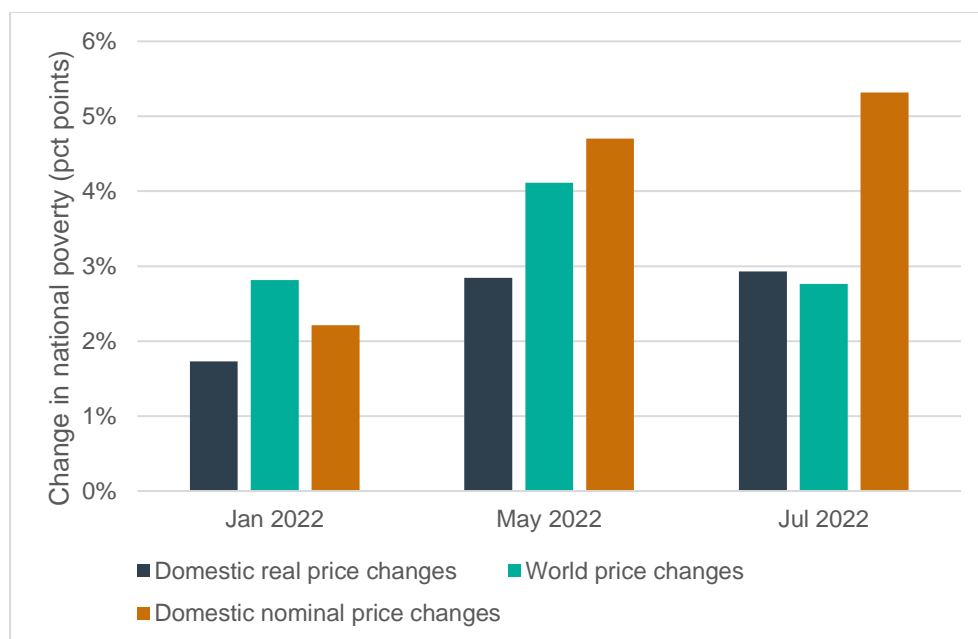
As discussed earlier, the shocks in international prices are generally not fully transmitted to domestic markets. In the case of wheat, domestic real prices fell while world prices rose, largely due to policy intervention in the form of price controls. In maize markets, 89 percent of the international shock was transmitted to local markets during this period. And somewhat surprisingly, the increase in the real price of sorghum in local markets was actually larger than the increase in world markets.

In Figure 3, we compare the estimated actual change in poverty (in green) with a hypothetical change in poverty assuming full transmission of world price shocks (in blue). In the first two periods, the full transmission of world price shocks would have resulted in larger increases in poverty. More specifically, the full transmission of the international price shock for these three commodities would have resulted in the national poverty rate being about 1 percentage point higher. In the third period, the two would have generated similar poverty impacts. This fits the pattern found in other countries, that domestic price shocks are dampened compared to international price shocks, so that the actual

impact on poverty is somewhat less than it would be with full transmission of the international price shocks.

This should not be interpreted as a justification for the controls that the government imposed on bread prices. This probably had only a small effect on poverty given that most bread consumption is in urban areas where poverty rates are low, and wheat is only a small part of the diet and budgets of households in Burkina Faso. Furthermore, the price controls are not sustainable – at some point, bakeries will stop producing bread until bread prices are allowed to rise or until the government provides subsidies or subsidized flour.

Figure 3. Sensitivity of poverty impact to alternative assumptions



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

Note: Our best estimate of the poverty impact of international shocks uses domestic real price changes (in green). Full transmission of international shocks is represented by the world price changes (in blue). And the domestic nominal price increase (in red) describes the impact of both international shocks and inflation on the three commodities, while assuming other prices and income are fixed in nominal terms.

A bigger factor is the fact that domestic maize prices did not rise as much as international prices. Maize is much more widely consumed than wheat, particularly among rural and low-income households. The government has few levers for controlling the domestic price of maize, so it is likely that the changes in the real price of maize are related to domestic factors, such as weather-related supply shocks.

The second alternative is to estimate the poverty impact of the increase in domestic *nominal* prices of the three commodities, which is the combination of the increase in the real price and the increase associated with domestic inflation, while assuming that all other prices and incomes are fixed in nominal terms over the period being examined. The results are shown in red in Figure 3. In this case, the poverty rate would increase to rise 2.2 percentage points by January 2022, 4.7 percentage points in April 2022, and 5.3 percentage points by July 2022. The poverty rate under these assumptions continues to rise between April and July 2022 in spite of declining world prices because of the effect of domestic inflation on the nominal prices of the three commodities. As noted above, this likely overstates the impact of the world grain price rise since it includes the effect of inflation on the three commodities but excludes the effect of inflation on incomes.

6. Summary

World grain prices began to rise in 2020 soon after the onset of the Covid-19 epidemic and spiked sharply in early 2022 in response to the war in Ukraine. Wheat and maize prices were particularly affected due to the importance of Russia and Ukraine as exporters of these commodities. A key question is: how these higher prices for staple grains are affecting poverty and food security in low-income countries? We find that the international price shocks were not fully transmitted to domestic markets in Burkina Faso. For example, as the international price of wheat rose, the domestic price of bread was kept fixed by price controls, meaning that it declined in real (inflation adjusted) terms. The real price of maize rose, but less than world prices did. In the case of sorghum, the real domestic price rose slightly more than the world price.

We used information on the spending patterns and composition of income for households in Burkina Faso to simulate the impact of these price changes on income and poverty. Overall, the higher prices increased headcount poverty by 2.9 percentage points from February 2020 (before Covid-19) to July 2022, when world prices began to decline. Poverty increased more in rural areas (3.5 percentage points) than in urban areas (0.9 percentage points). We found that poverty in Burkina Faso increases less than it would have if the international price shocks had been fully transmitted to local markets. Policy clearly played a role in suppressing local bread prices, but the changes in the real price of maize were more likely due to domestic market factors.

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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