

COUNTRY BRIEF 24

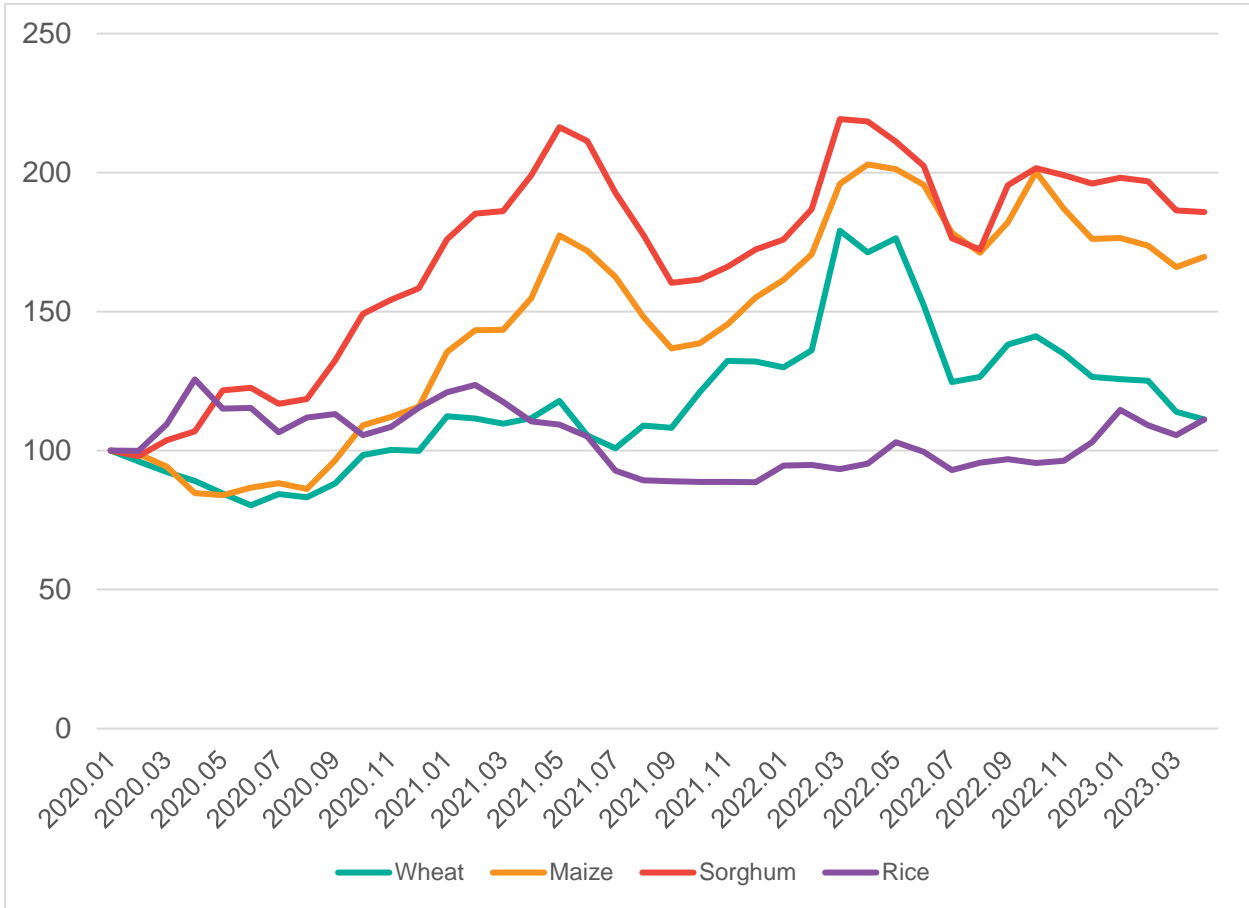
Poverty Impacts of Food Price Increases in Mali

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1. Trends in grain prices in Mali

Because of low incomes and associated large shares of expenditure on food, Mali is potentially very vulnerable to sharp increases in the prices of key grain staples such as maize and wheat. A first step in understanding the impacts of changes in the prices of these products is to examine developments in their prices on world markets. After a long period of relatively stable prices on world markets, the prices of key food staples began to rise during 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 Mali.

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



Sources: FAO GIEWS data accessed 4 May 2023. Wheat: US SRW wheat, Gulf Ports; Maize: US #2 Yellow, Gulf; Sorghum: US Export Sorghum, Gulf; Rice: Thai 5% broken, Bangkok.

Figure 1 presents the movements in the prices of four key grain staples—maize, rice, sorghum and wheat—from the beginning of 2020. It shows that the 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 level.

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—might 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 percent¹.

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 Mali

A key influence on the importance of any particular food when considering poverty impacts is the share of total calorie consumption accounted for by that food. Foods that contribute a large share of calorie consumption are likely to be important both because of this large average budget share and because this share is likely particularly high for poorer people. The average share is shown in Table 1 for each of the key staples whose price rose sharply during the COVID and Ukraine crises. This Table reveals that the calorie share for maize is the highest of the three at 17 percent, while sorghum accounts for 13 percent and wheat for only 5.2 percent. It should be noted that rice and millet were more important sources of calories in Mali but are not considered because rice prices were relatively stable and there is no international price indicator for millet.

As shown by Deaton (1989) the importance of a staple food in the diet is not the only factor that determines its real impact on household welfare when subsistence production is important. Rather, what matters is the difference between the share of the good in total income and its share in total expenditures—the so-called Net Benefit Ratio (NBR) for the food. Table 1 shows that the share of household income from maize is smaller than the share of expenditure for each staple food. The NBR as a percentage of initial expenditures is larger in absolute value for sorghum (at 1.7 percent) than for maize (1.4 percent) and for wheat (0.3 percent). These results show that average household real incomes are likely to fall by 0.17 percent for a 10 percent increase in the price of sorghum, by 0.14 or 0.003 percent for the same rise in the prices of maize or wheat respectively.

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

	Calorie share of diets (%)	Budget shares		
		Income share (%)	Expend-iture share (%)	Net benefit ratio (%)
Maize	17.0	1.6	2.9	-1.4
Wheat	5.2	0.1	0.4	-0.3
Sorghum	13.3	1.9	3.5	-1.7

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.

What matters for household incomes in Mali is not changes in world prices, but rather changes in domestic prices. Table 2 presents the changes in world prices and in nominal and real domestic prices relative to January 2020 prices. Although inflation rates in Mali were quite low over much of this period— at 0.4 percent in 2020, 3.9 percent in 2021 and 7.6 percent in 2022—the differences between the nominal and real price changes over this period of nearly three years are quite noticeable. For consistency with other country studies in this series, we focus primarily on the changes in real domestic prices.

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 only a two percent increase in real domestic prices. The further 46 percentage point increase in world wheat prices to May 2022 was associated with a 1 percentage point decline in real domestic prices. The sharp decline in world wheat prices to July 2022 translated into a real price decline of only four percentage points. Over the whole period, domestic wheat prices were essentially unchanged.

The real domestic price for maize decreased by 49 percent during the COVID pandemic, comparable with the 61 percent increase in world prices during this period. The sharp rise in world prices following the Ukraine invasion was associated with a similarly sharp increase in domestic prices, while the decline in world prices to July 2022 saw essentially no change in domestic maize prices. Sorghum prices rose in each period, in contrast with the rise and subsequent fall in world prices.

Table 2. International and domestic cereal prices in Mali

		Price index (100 = February 2020)			
Commodity	Price type	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	102	101	97
Maize	World (US\$)	100	161	201	178
	Local nominal	100	163	215	222
	Local real	100	149	193	192
Sorghum	World (US\$)	100	205	229	190
	Local nominal	100	171	267	279
	Local real	100	156	239	241

Sources: Wheat and Maize World Prices, GIEWS; Sorghum World Price, IMF. Wheat and Maize Domestic Prices, WFP; Sorghum Nominal and Real Domestic Prices, FAO-GIEWS. Wheat and Maize Real Domestic Prices deflated using the FAO-GIEWS deflator for Sorghum.

Mali depends heavily on imported wheat, with imports accounting for over 90 percent of consumption. Because wheat production is so small, there is little information available about policies affecting agricultural trade in sources such as Nkuingoua and Pernechele (2022) or Dewbre and Borot de Battisti (2008). WTO's Integrated database² reports that the applied tariff is 5 percent, which leaves little scope for reducing tariffs in order to avoid passing higher world prices into domestic markets. Given Mali's geographic isolation, some delay in transmission of short-term price changes might be expected, but this would not explain the absence of adjustment over the two and a half years under consideration. One possible explanation might be some form of rationing, given that consumption appears to have fallen by around a quarter³ in the July 2021 to June 2022 year despite the apparently stable wheat price.

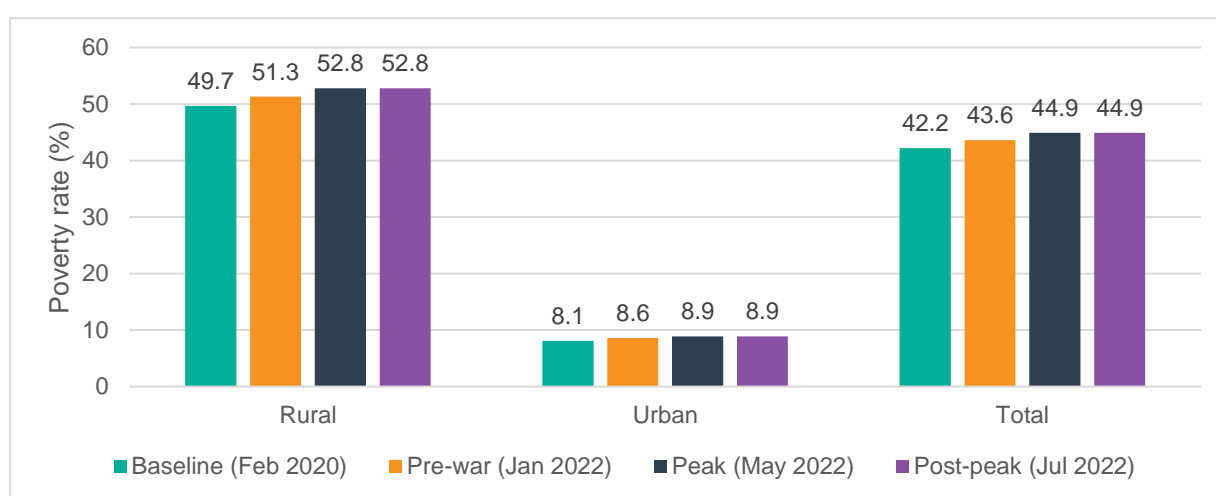
For maize and sorghum, reported trade has been zero during the most recent five years³. Even though this would trigger retaliation from its neighbors (USDA 2023), the government banned exports of these products from December 2021, suggesting that it sought to insulate its market from the increases in their world prices. Nkuingoua and Pernechele (2022) note that restrictions on exports have contributed to average nominal rate of protection of -43 percent for maize and -25 percent for sorghum between 2005 and 2020. The sharp rise in real maize prices occurred despite little change in production and a decline in stocks during 2020-21. A fall in production of sorghum of around a third in 2021-22 likely contributed substantially to the much larger increase in domestic sorghum prices—both relative to world prices and to the domestic price of maize.

² <http://tao.wto.org/report/TariffLines.aspx> accessed 11 May 2023.

³ USDA PSD database, <https://apps.fas.usda.gov/psdonline/app/index.html#/app/home>, accessed 11 May 2023.

In our analysis of poverty impacts, we focus on changes in prices up to July of 2022 because, as shown in Figure 1, the world prices of wheat, maize and sorghum remained in broadly the same range between that time and April of 2023. Figure 2 compares poverty rates at baseline with those for the three key time periods considered in the analysis. Clearly, poverty rates are much higher and increase much more in percentage point terms in rural areas than in urban areas, with rural poverty rising from 49.7 percent to 52.8 percent at July 2022 prices. The increase in poverty in urban areas is much smaller in percentage point terms, at 0.8, than in rural areas, although this increase is almost 10 percent of the initial share of poor people. The biggest contributing factor to the estimated rise in poverty is the rise in the real price of sorghum, which had both the largest price increases and the greatest leverage on the poverty rate because of its relatively large adverse Net Benefit Ratio. While alarming, these estimates of the price impacts on poverty omit the adverse impacts on farm incomes of the sharp decline in the 2021 sorghum harvest.

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.

3. Sensitivity Analyses to Key Assumptions

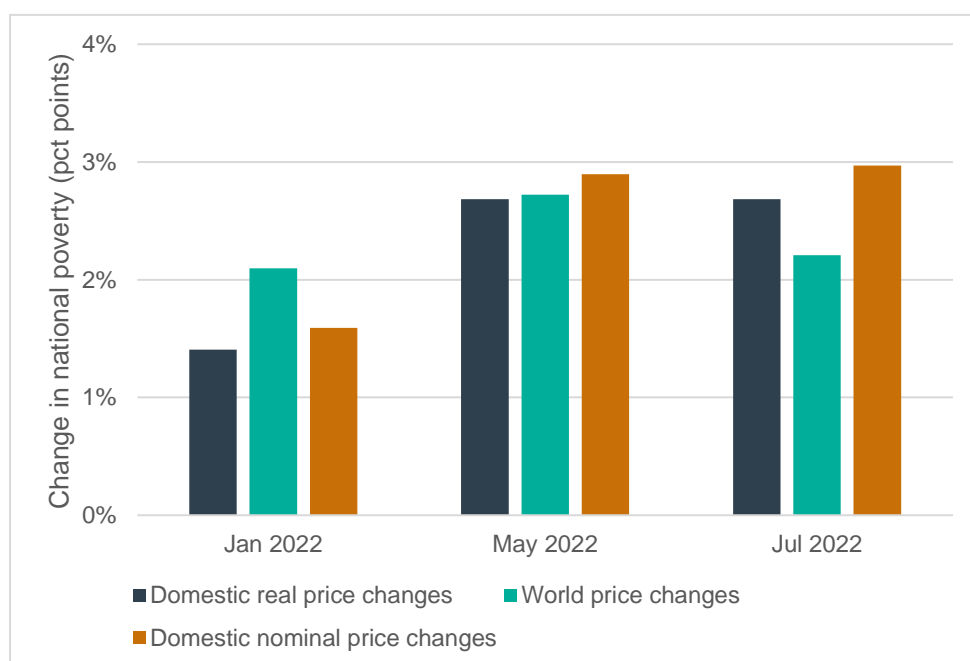
Two very important assumptions in this analysis were: (i) that domestic prices did not follow world price changes, and (ii) that what matters is the real, rather than the nominal, increases in domestic prices. key question is the extent to which the insulation of Mali's domestic markets from the increase in world prices helped to reduce the impact of the world price increases on poverty. Another is how sensitive the results would have been to use of nominal price increases, rather than the real price increases that were the focus of the previous section.

To address these questions, Figure 3 contains three bars for each time period. The first shows the change in poverty rates based on real grain price changes. The second shows the impacts had the changes in world prices been passed fully into domestic prices. The third shows the impacts had the analysis been based on the changes in nominal domestic grain prices. Comparison of the first two bars shows that the insulation of Mali's markets from world price increases reduced the poverty impact up to January of 2022 by around 0.7 percentage points. But by May, the poverty impact of Mali's domestic price increases was roughly the same as if world price changes had been transmitted directly. For the period to July 2022, the poverty impact of the price increases in Mali was substantially greater than had producers and consumers in Mali been experiencing the full brunt of the increases in world prices to that time.

When considering the global economic impacts of price insulating policies, it should, of course, be remembered that the volatility of world prices is magnified by the use of price insulating policies in many major grain producing and consuming countries. Martin and Minot (2022) estimate that the shocks to world wheat prices over this period were roughly doubled by these price insulating policies. Countries that use price insulating policies such as variable tariffs or export levies benefit directly from lower price volatility while contributing to global price volatility. Policy approaches such as export bans, by contrast, contribute to exacerbating global price volatility but may expose the countries using them to greater price volatility.

Comparison of the first and third bars in Figure 3 shows that poverty impacts were only modestly higher when nominal, rather than real, price changes were used in the analysis. This is perhaps not surprising an average inflation rate of less than 5 percent per year between January 2020 and January 2022 and 6.5 percent between January 2020 and July 2022. The largest impact was for the period up to July 2022, when the estimate based on nominal prices was 3.0 percent, rather than the 2.7 percent obtained when using real price increases.

Figure 3. Sensitivity of Poverty Impacts of Food Price Rises: Mali



Notes: The first bar in each set is based on changes in real domestic prices; the second on the assumption that domestic prices moved in line with world prices and the third on use of nominal, as distinct from real 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 Mali, as in many other developing countries, net purchases of households tend to exceed net sales, frequently 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 and food security can be substantial. However, it may be quite misleading to assume that domestic prices will move in line with world prices, especially in land-locked countries such as Mali where key staple

foods such as maize and sorghum may be nontraded—whether because of high transport costs and/or policy restrictions.

The quantitative restrictions used to insulate domestic staple food prices in Mali from world prices carry with them a substantial risk of creating even worse volatility resulting principally from shocks to domestic production. In the particular sample considered, this problem was highlighted by the dramatic increase in the domestic price of sorghum associated with the poor harvest in 2021. A key policy question is whether a more market-oriented policy, such as one focusing on expanding exports, perhaps with limited use of price-based measures such as export taxes, might achieve Malian policy goals with less instability than is delivered by current policies.

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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