

# GHANA

## Strategy Support Program



### Impact of Food Price Increase on Household Welfare in Ghana

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DISCUSSION NOTE # 016

#### BACKGROUND

The global food crisis of 2007–2008 was characterized by a sharp increase in food and other commodity prices on world markets. Between January 2007 and March 2008, the prices of wheat and rice doubled while the price of maize rose 42 percent. Over this same period, the food price index of the Food and Agriculture Organization (FAO) increased 61 percent. After declining in 2008 and 2009, the prices of rice and other commodities surged again in 2010–2011 (FAO 2011).

These trends in world markets resulted in sharp increases in food prices in Ghana and other developing countries, although the degree of price transmission varied significantly. These food price spikes reduced the purchasing power of urban households and other food buyers, forcing them to decrease non-food spending and shift to cheaper foods. Poor urban households were particularly affected because they spend a large share of their income on food. At the national level, food-importing countries faced balance of payment pressure because of the increasing costs of food imports as well as pressure on the fiscal balance due to the higher cost of food and nutrition programs.

#### OBJECTIVE

The main objective of this study was to examine the impact of food price increases on the well-being of different types of households in Ghana. This information is useful in designing policies and programs to reduce the adverse impact of higher food prices and reducing vulnerability to food price fluctuations. The results are also useful for understanding the trade-offs in food tariff policy, which protects Ghanaian farmers from imports but also raises the cost of food for consumers. This is particularly relevant in the case of rice, for which the government maintains an import tariff to support farmers.

#### METHODS

Higher food prices directly affect households in two ways. As consumers, households are adversely affected by higher prices because they reduce purchasing power. Faced with higher prices, households cannot afford to purchase the same quantity of food

unless they cut back on non-food expenditure. In either case, their standard of living is reduced. At the same time, higher prices of food commodities may benefit farm households with marketed surpluses of the commodity. Higher food prices also have indirect effects, such as changes in the exchange rate and changes in demand for labor, but these effects are likely to be smaller than the direct effects.

In this study, we use a method proposed by Deaton (1989) and used widely by other researchers (Budd 1993; Barrett and Dorosh 1996; Minot and Goletti 1998; Ivanic and Martin 2008; Arndt et al. 2008; Wodon and Zaman 2008). We define the welfare impact as the amount of money necessary to compensate the household for the price change, leaving it with the same purchasing power as before the change. In the short run, the welfare impact is simply the additional cost or revenue associated with the higher prices. For example, if an urban household spends US\$20 per month on maize meal and the price rises 30 percent, the welfare impact is US\$6 per month because with this sum the household can consume the same quantity of maize meal as before. In the longer run, households adjust their production and spending patterns in response to the higher prices, so the welfare impact of a price change is less negative or more positive. The difference between the short and long run depends on how much households can adjust to the price changes—in other words, the price elasticity of demand and supply.

Thus, in order to estimate the welfare impact of higher food prices, we need information on:

- The magnitude of the price increases
- The composition of expenditure and income of Ghanaian households
- Estimates of the price elasticity of demand and the supply elasticity for commodities

In this study, we estimate the impact of historical price increases in maize, rice, and all food in Ghana over the period June 2007 to June 2008. Over this period, maize prices rose 81%, rice prices rose 31%, and the consumer price index for food rose 18%.

For information on the composition of household expenditure and income, we use data from the 2005/06 Ghana Living Standards Survey (GLSS). Although the survey was conducted several years before the global food crisis, food consumption and income patterns were relatively stable over time. For the long-run welfare impact, we assume the price elasticity of demand for each commodity as -0.3 and the supply elasticity as 0.3.

By combining the GLSS data, the historical changes in the price of maize, rice, and food over 2007/08 as well as the price elasticity, we can calculate the welfare impact in the short and long term for each household. We can then aggregate the results to any group of households, such as those in a region, an income category, or a farm-size category. We can also estimate changes in the incidence of poverty for each group.

## RESULTS

On average, maize accounts for 6 percent of expenditure and 5 percent of income in Ghana. This implies that the short-term effect of higher maize prices is slightly negative for households. The simulations indicate that an 81 percent increase in producer and consumer maize prices raises the poverty rate by 0.6 percentage points in the short term. This relatively small impact reflects a decrease in poverty among surplus maize farmers that is roughly equal to the increase in poverty among net buyers of maize.

The adverse effect on income and poverty is greatest for households in Upper East, Upper West, and Volta Regions, urban households, female-headed households, poor households, and those with small farms. Among these groups, the poverty rate rises 0.1 to 3.6 percentage points in the base simulation.

On the other hand, some groups actually benefit from higher maize prices, including maize farmers, farmers with more than 2 ha, and those in Central, Ashanti, and Northern Regions.

The results of the long-term simulations were similar, though somewhat more positive because they take into account household responses to the higher prices. In the long term, some consumers respond to the higher prices by switching to root crops and other staples, while farmers take advantage of higher maize prices by expanding production. In both cases, they are somewhat better off in the long term than in the short term.

In Ghana, rice is less important than maize in several ways. Rice accounts for 3 percent of consumption compared with 6 percent for maize. The value of rice production is less than 1 percent of household income compared with 5 percent for maize. Rice is grown by just 5 percent of Ghanaian households compared with 41 percent who grow maize. In spite of this, the adverse impact of a given price increase is greater for rice than for maize because the average net benefit ratio is more negative.

This is a reflection of the fact that Ghana is essentially self-sufficient in maize but has a large national deficit in rice. The number of rice farmers is much smaller than the number of rice consumers, so the total gains to rice farmers from higher rice prices are significantly less than total costs to rice consumers.

Simulations of the 36 percent rice price increase in 2007/08 confirm that rice farmers benefit, but almost every other group (defined by location, sex of head, region, expenditure quintile, or farm size category) is negatively affected by higher rice prices. Although rice farmers are quite poor (70 percent are poor compared with 35 percent of all rural households), the net effect of higher rice prices is to increase poverty. The higher rice price raises the national poverty rate by 0.4 percentage points. For almost all groups, the increase in poverty is less than 1 percentage point. For the same percentage increase, a rice price would have a more adverse effect than a maize price increase, but the rice price increase over 2007/08 was smaller (36 percent) than the maize price increase (81 percent) over that period.

Food production represents 36 percent of household income, while food consumption accounts for 49 percent of household expenditure. This means that the net benefit ratio is -0.13, implying that increases in producer and consumer prices would adversely affect household income in the short term. The adverse effect is greatest for urban households, female-headed households, households in Greater Accra, richer households, and those with small farms. A few groups would gain from higher food prices: food growers; households in Brong-Ahafo, Northern, and Upper West Regions; and households with more than 2 ha. The increase in the food consumer price index over 2007/08 was 18 percent. If producer price increase rose in the same proportion, national poverty would increase about 1 percentage point.

## CONCLUSIONS

The results presented in this study confirm our expectation that high food prices have significant effects on the well-being of households in sub-Saharan Africa. Furthermore, the results corroborate previous studies that higher food prices generally have an adverse effect on poverty. However, the impact of higher food prices is more complex and varied than expected. Here we highlight five conclusions that can be drawn from the results.

1. The average effect of food price increases on households in Ghana is relatively small. For example, the 81 percent increase in maize prices that occurred over 2007/08 is estimated to have increased the national incidence of poverty by less than 1 percentage point. The explanation is that the negative effects on urban households and other net buyers are largely offset by the positive effects on households with net sales.

2. Although the average impact is relatively small, the impact on specific types of households can be quite large. For example, the short-term effect of the higher food prices assuming a fixed marketing margin is to reduce poverty by 1.8 percentage points. However, the poverty rate falls by 7 percentage points among households in Northern Region and 10.5 percentage points among farmers with more than 5 ha.
3. The number of net sellers of each staple commodity is relatively small, even among rural households. For example, only 31 percent of rural households in Ghana are net sellers of maize, and only 4 percent of rural households are net sellers of rice. Furthermore, net sellers are much more common among the larger farmers. Among households with more than 5 ha, 41 percent are net sellers of maize and 8 percent are net sellers of rice. This suggests that a policy of supporting commodity prices will disproportionately benefit larger farmers.
4. The impact of a given food price increase on poverty is not necessarily proportional to its importance in the local economy. For example, maize is more important than rice in Ghana, whether measured by its caloric contribution to the diet or the proportion of farmers who depend on it as a source of income. Nonetheless, household welfare and poverty are more sensitive to an increase in rice prices than a similar increase in maize prices. This is because Ghana is almost self-sufficient in maize, so that the gains to producers from maize price increases largely offset the losses to consumers. In contrast, Ghana is a net importer of rice, so the gains to farmers from a rice price increase are much smaller than the losses to consumers.
5. Ghana imposes an import tariff on rice in order to reduce import dependency, stimulate domestic production, and

reduce poverty. Although the tariff may well achieve the first two objectives, the results of our analysis indicate that it is not likely to reduce poverty. Higher rice prices do reduce poverty among rice growers, and rice growers are considerably poorer than other rural households. However, just 5 percent of all households grow rice, and only 3 percent are net sellers of rice. Even in Upper East Region, which has the highest proportion of net rice sellers (20 percent), the number of net buyers is greater (55 percent). At the national level, three quarters of all rural households are net buyers of rice. As a result, the benefits of rice import tariffs in terms of reducing poverty among rice farmers is more than offset by the negative effects of higher rice prices on urban households and net buying rural households. Overall, higher rice prices result in somewhat higher rates of poverty at the national level.

The analysis of rice prices assumes that domestic and imported rice are perfect substitutes and that rice prices are spatially integrated, meaning that changes elsewhere, in Accra for example, are transmitted to the north. Cudjoe et al. (2008) show that rice markets are relatively well integrated, but not perfectly.

To the extent that local and imported rice are imperfect substitutes or that rice prices are imperfectly transmitted throughout the country, the argument for a rice tariff is even weaker. Under these conditions, a rice tariff would raise the price of imported rice, hurting consumers, but have a smaller effect in raising producer prices faced by rice farmers in Upper East and elsewhere. In other words, the offsetting benefits of the rice tariff would be weaker in the case of imperfect substitution or poor market integration.

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