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Welfare impact of higher maize prices when allowing for heterogeneous price increases ☆

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ABSTRACT

In this paper, we explore the short-term welfare impact of higher maize prices on different regions and socioeconomic groups in Kenya. We find that approximately 80% of the population would be negatively affected by higher maize prices and that poor households would lose a larger proportion of their welfare than wealthy households. More specifically, rural landless households would lose the most, whereas households with landholdings of five acres or more would gain. We simulate a 25% increase in maize prices and find that rural poverty would increase by approximately 1 percentage point and urban poverty by 0.5 percentage points. Moreover, the impact differs among regions; poverty would increase by 3 percentage points in the rural parts of Coast Province, whereas it would be almost unchanged in the rural parts of Western Province. Furthermore, we relax the standard assumption that consumer and producer prices change in the same proportions and allow for heterogeneity in marketing margins among districts. We demonstrate that relaxing this assumption substantially affects the results and that the results from previous research were thus likely biased.

Introduction

The global economy experienced a substantial increase in food prices between 2005 and 2011, severely impacting poverty worldwide. Moreover, increases in world food prices between 2005 and 2007 were estimated to have added approximately 100 million people to the ranks of the poor (Ivanic and Martin, 2008), which corresponds to a loss of almost seven years of work in eradicating global poverty. Although food prices have recently been in decline, it is likely that real agricultural prices will increase in the future as a result of growing incomes and populations, which may be compounded by the negative effects of climate change on agricultural production (IFPRI, 2010).

In this paper, we investigate the short-term welfare effects of higher maize prices on different household groups in Kenya. Maize is the most important crop in Kenya and is grown by more than 90% of farming households (KNBS, 2007). Nonetheless, most households also buy some maize in the market; therefore, it is not a straightforward task to predict who would lose and who would gain if maize prices increased.

As our first contribution to the literature, we analyze the impact of rising maize prices on different socioeconomic groups in Kenya. Apart from differentiating between income groups, we also divide households by their locations, welfare levels and land ownership. Our categorizations result in the possibility of identifying detailed targeted policy measures that might counterbalance the possible negative effects of a price increase. As opposed to earlier studies of Kenya that have focused only on rural households, we employ nationally representative household survey data that enable us to explore the welfare impact across different provinces and on urban households in comparison with rural households. Although most urban households are net buyers of maize, it is nonetheless important to determine how severe the impact is on these groups, particularly when the objective is to identify implications for policy.

In addition, we have made important improvements to the method of analyzing the welfare impact of a price increase. First, we build on the work of Dawe and Maltsoglou (2014), who relax the standard assumption that consumer and producer prices change in equal proportion. We clearly demonstrate how relaxing this assumption affects the results for various groups of households and for conclusions in general. However, Dawe and

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Maltsoglou (2014) assume that the marketing margin, which is the difference between consumer and producer prices, is constant among households. Since prices and marketing margins differ among districts, this assumption might yield misleading results. Therefore, we extend the method developed by Dawe and Maltsoglou (2014) and allow for different marketing margins among districts. We show that this is important when analyzing effects on different geographical groups and thus suggests that previous research relying on this assumption may have been biased. Furthermore, consumer and producer prices change differently, depending on the reasons for the price increase. For example, an increase in consumer prices due to higher world market prices does not necessarily translate into higher producer prices. Therefore, we demonstrate how the level of transmission between consumer and producer prices influences the results. Taken together, our results point to the importance of considering what type of price increase we are interested in, moving away from the standard assumption that all actors face the same proportional increase in prices.

To investigate the welfare impact on households, we calculate the net benefit ratio (NBR) that shows which households gain or lose from a price increase in maize. Thereafter, we simulate a 25% price increase to observe the potential change in poverty for various groups. We chose 25% because this figure has been used in prior research based in Kenya (Mghenyi et al., 2011) and is consistent with observed increases in price. Nevertheless, much larger increases have also been observed historically. For example, between June 2010 and June 2011, the price of maize in Kenya increased by more than 100%.

The main focus of this paper is on the short-term effects of a price increase. However, in the first part of our analysis, we demonstrate the consequences of allowing supply and demand to adjust over time. In line with previous research, we find that this adjustment has only a marginal effect on the results. Nevertheless, we acknowledge that a long-run price increase might potentially have further effects on the economy that are not included in our analysis. We find that approximately 80% of the population would be negatively affected if the price of maize increased. Analyzing the effect on various groups, we generally find that poorer households lose a larger part of their income than wealthier households. Diversifying the effect to different socioeconomic groups, we find that rural landless households would lose the most, whereas households with landholdings of five acres or more would gain.

The remainder of this paper is organized as follows. The next chapter presents the results from the prior literature. Chapter three describes and summarizes recent events in the agricultural sector, with a particular focus on maize in Kenya. Chapter four outlines the paper's methodologies and chapter five presents the data. Our results are presented in chapter six. The final section concludes.

Previous literature

A number of studies have examined the impact of escalating food prices on poverty, both globally and in specific countries. A common finding is that rising food prices lead to increased poverty over the short term. Reviewing the evidence of the potential impact of higher food prices in sub-Saharan Africa, Wodon and Zaman (2009) find that a price increase would have a substantial effect on the poor. For example, in West and Central Africa, a 50% price rise in cereals might increase poverty by 4.4% in the short term. When potential gains for producers are factored in, poverty would still increase by 2.5%. Christiansen and Demery (2007) find that higher food prices are likely to increase poverty in a number of African countries even after countervailing wage and productivity effects are considered. Using data from eleven different countries Zezza et al. (2009) concludes that the poorest households are most affected by an increase in prices.

Other studies have focused on the country-specific impact of the food crisis. In a study of Mozambique, Arndt et al. (2008) note that urban households are more vulnerable to food price increases, whereas rural households – particularly those in the middle-income wealth distribution bracket – frequently benefit from their net seller position. These authors conclude that the macroeconomic and poverty effects of a global price increase would be negative and substantial, particularly for urban households.

Two previous studies have analyzed the welfare impact of higher maize prices in Kenya. Employing rural household survey data from the Tegemeo Institute of Agricultural and Policy and Development, Jayne et al. (2000) focus on small-scale farmers and find that a large number of small-scale farmer households are net buyers of maize and would consequently be hurt in the short term by higher prices. These authors find that households that are net-sellers have annual per capita incomes almost double those of net-buying households. However, Jayne et al. (2000) do not utilize nationally representative data and include only rural households.

A more recent study examines the welfare impact of a maize price increase in rural Kenya both from a short-term and medium-term perspective (Mghenyi et al., 2011). These authors conclude that a 25% increase in the price of maize would cause a rather small increase in poverty, with a median change of about zero. However, the results demonstrate substantial differences across regions; approximately 80% of the households in zones with high potential to grow maize would benefit and an equal proportion of households would lose in regions not suited for growing maize. These authors also demonstrate that the poorest households would lose the most.

As opposed to Mghenyi et al. (2011) and Jayne et al. (2000), we employ nationally representative data and include both urban and rural areas of Kenya.

Maize in Kenya

Despite the relative decline of agriculture, farming remains the dominant way of life for much of Kenya's population, and approximately one-third of the working population is involved in family farming (World Bank, 2012). Maize is the most important crop and is grown by over 90% of farming households (KNBS, 2007). Production is volatile, and no clear trend toward increased production has been shown. National maize production has not kept pace with consumption over the years. In 2008, Kenya's annual maize consumption was estimated to exceed 36 million bags, which equals approximately one bag per person.

After farmers have harvested their maize, they utilize some of the produce for home consumption and sell the rest to the highest bidder. Maize is generally sold to a transporter or an assembler. The transporter/assembler then sells the maize to a wholesaler who is typically located in the nearest city. From the wholesaler, the maize is sold to a miller or directly to a retailer, who then sells it to consumers. The farmer can also choose to sell the maize to the National Cereal and Produce Board (NCPB), which stores the maize and releases it in times of scarcity to combat rising prices (Höffler and Ochieng, 2008).

In the early 1990s, the government partly liberalized the maize sector by eliminating restrictions on the movement of grain and price controls. Analyzing the impact of the reform, Nyoro et al. (2004) conclude that liberalizing the domestic market reduced transaction costs in marketing and distribution and increased incentives to traders and marketers. However, government involvement remains substantial with respect to the NCPB, which