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How much have domestic food prices increased in the new era of higher food prices?

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ABSTRACT

Analysis of domestic price data (adjusted for inflation) from a large range of low- and middle-income countries shows that domestic staple food prices were higher in 2013 than they were in the first half of 2007: consumption-weighted real domestic rice, wheat and maize price indices increased by 19, 19 and 29 percent, respectively. The domestic price indices broadly follow world price movements, but domestic price changes are attenuated to an important extent due to government policies, transport costs, changes in exchange rates and other factors. While world price changes thus overstate the impact on food security of farmers and consumers, the observed increases in domestic prices are still substantial for the poor. Domestic price changes have varied widely across countries, and the changes in any particular country are not necessarily due to changes in world market prices.

1. Introduction

There have been major changes in the world food economy over the past few years: oil prices were substantially higher from 2008 to 2013 than they were in the preceding two decades, biofuels demand has grown (see de Gorter et al., 2013; Tyner, 2013 for differing views on how important this has been for the level of grain prices) and price volatility seems to have increased (with two major cereal price spikes, one in 2007–2008 and one in 2010–2011). At the same time, population growth continues (albeit at a slower growth rate than in the past), scarcity of natural resources such as land and water is getting worse, urbanization is reducing labour supplies in the countryside and economic growth in developing countries is leading to greater demand for livestock products that require large quantities of cereal as feedstock (Conforti, 2011). Last, but not necessarily least, climate change presents major uncertainties for agricultural production. These trends have led many to suggest that we are in an era of higher and/or more volatile food prices (e.g., Naylor and Falcon, 2010; Dupont and Thirlwell 2009; Irwin and Good, 2009; OECD, 2014).

When discussing higher food prices, reference is typically made to world prices denominated in US dollars. For developing countries, world market prices are crucially important for import bills, foreign exchange earnings, and as signals to guide resource allocation. But it is well-known that changes in world market prices are not always transmitted into changes in domestic prices due to transport costs, government policies, changes in exchange rates and market failures such as imperfect information (Hassouneh et al., 2012; Conforti, 2004; Timmer, 1993; Dawe, 2009; Minot, 2010, Rapsomanikis, 2011; Short et al., 2014; Baquedano and Liefert, 2014). Furthermore, it is domestic prices that affect poverty and welfare, because these are the prices actually received by farmers and paid by consumers. These observations suggest that it is important to understand the behaviour of domestic food prices in addition to global prices, in particular since the world food crisis of 2007–2008.[1,2]

When analyzing food prices, it is particularly important to understand the behaviour of cereal prices (as distinct from prices of meat, dairy, fruits, vegetables and other foods), because cereals are the most important expenditure item for the poor and food insecure, typically accounting for 50 percent of dietary energy supply and 20–25 percent of total expenditures for people in the bottom quintile of the income distribution (FAO, 2011). In addition, even though cereals are often missing many key micronutrients, cereal prices are crucial for nutrition because higher cereal prices can crowd out expenditures on more nutritious foods such as eggs, milk and green leafy vegetables (Block et al., 2004; Torlesse et al.,

[1] Just like world prices, domestic prices also influence resource allocation.

[2] We do not address the impact of food prices on poverty, which has been addressed elsewhere (Barrett and Bellemare, 2011; Ivanic et al., 2011; Robles and Torero, 2010; Headey, 2014; Dawe et al., 2010; Dorward, 2012).

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2003; de Brauw, 2011). In this paper, we focus on the three main cereals consumed by humans: rice, wheat and maize.

In the wake of the world food price crisis of 2007–2008, there has been a strong effort to collect data on domestic food prices. FAO has put substantial effort into constructing a database of domestic wholesale and retail prices for a number of food items for a large number of countries, and this database is freely available (FAO, 2014a). The ultimate data sources in most cases are official government sources (full details of specific sources for each country are available in FAO, 2014a).

The objective of this paper is to analyze these data to describe the behaviour of domestic staple food prices since the world food price crisis, including comparisons across regions, countries and the three cereals. After a description of the data and the methods used to analyze them, the remainder of this paper is split into four main sections: (i) broad patterns of domestic prices since 2007, including an assessment of how much domestic staple food prices have increased since that time; (ii) variability across regions and countries, as well as variability over time within countries (i.e., domestic price volatility); (iii) a comparison of price movements in world and domestic markets; and (iv) a comparison of the domestic price indices calculated here with other food price indices. These data and comparisons provide an assessment of the magnitude of domestic staple food price changes since the world food crisis.

2. Data and methods

The focus of this is paper is on wholesale and retail prices, which are best viewed as consumer prices. This focus on the consumer is mandated by the scarcity of farm-level price data, which are not included in FAO (2014a). Collection of more frequent and systematic farm-level price data should be a major priority for understanding supply response and the food security of farmers who receive income from crop sales.[3] The focus of this paper is also on low- and middle-income countries (LMIC), where food constitutes a larger share of household budgets and high prices are more of a food security concern (Regmi and Meade, 2013).

Since our objective is to assess cereal price changes as experienced in LMIC, we measure price changes in local currency (LC) terms. Using local currency prices has the disadvantage that we cannot calculate an average price level across countries, since it is not possible to compare price levels if the prices are in different currencies. But the advantage is that price changes are then measured in a manner that is relevant to domestic consumers, as exchange rate movements and other factors can lead to very different price changes in local currency and US dollar terms (FAO, 2011; Dorward, 2011).

Our first step was to bound the period of analysis. Starting the analysis in 2006 would have excluded a very large number of countries, while extending it into 2014 would have encountered a number of data gaps at the time of analysis. Thus, we analyze data over the period January 2007 to December 2013.

The database in FAO (2014a) is extensive: there are data for wholesale and retail markets, for different qualities, different forms (e.g. grain and flour), and different cities/locations, although not all types are available for a given commodity in a given country. But there are numerous cases of missing values in many of these series. In order for a specific data series to be considered, we decided that it must have no more than two consecutive missing data points. In four cases, however, we made an exception to this rule in order to avoid discarding a commodity/country combination entirely: the best available data series for those four commodity/country combinations had at most six consecutive missing data points. In cases where there were four or fewer consecutive missing data points, linear interpolation between adjacent data points was used to fill in the missing values. In the other two cases where there were five or six consecutive missing data points, seasonally adjusted linear interpolation was used to fill in the data gap. Price series with data gaps longer than 6 months were dropped.

Once the pool of "eligible" data series was determined, our first step was to select the data to be used for each country/commodity combination, because data are often available for multiple locations, multiple qualities or multiple marketing levels for a given staple food in a given country. We term each specific country/commodity combination (e.g. Kenya maize) a "case study." In order to choose which data series to analyze for a given case study, a set of ordered selection criteria were applied. Our first criterion was to use, whenever possible, retail price data (58 case studies), the justification being that these are the prices paid by consumers. However, if no retail price data were available for a particular case study, we used wholesale prices (45 case studies), which are usually linked quite closely to retail prices. In the case of wheat, if there were data for both wheat and wheat flour, we used data on wheat flour on the grounds that it is closer to the ultimate form in which it is consumed. Overall, we used data on wheat flour in 17 case studies, and data on wheat in 10 case studies.

Our second criterion was based on quality. We chose the lowest quality available, on the grounds that lower qualities are more important for the poor. That being said, prices of different qualities generally seemed to move broadly together within the same country.

Our third criterion was to use national average prices when available. When national average prices were unavailable, we used a weighted average price across all the markets in the given country for which data were available, using population weights obtained from Brinkhoff (2014), which collates demographic data from numerous national census bureaus. There were 30 case studies for which national average data were available, and an additional 21 case studies for which we calculated an average based on three or more locations. For the other 52 case studies, we used data from one (42 cases) or two (10 cases) locations in the country.

Application of these criteria leads to a total of 103 case studies of cereals distributed across 59 countries. There were 44 country case studies for rice, 32 for maize and 27 for wheat/wheat flour. For rice, wheat and maize respectively, our country coverage accounts for 92, 67, and 54 percent respectively of direct human food consumption[4] in LMIC. In all LMIC, including those for which we do not have price data, rice has the greatest total consumption among the three major cereals at 352 million tons (milled basis), followed by wheat at 337 million tons, with maize a distant third at 111 million tons.

After selecting the data series to analyze, our second step was to transform data on nominal domestic cereal prices into real terms by dividing by the domestic consumer price index (CPI) (IMF, 2014), which adjusts for the impact of inflation that tends to raise all prices and wages over time. Such an adjustment is essential when examining price behaviour over a period of seven years, because domestic inflation often exceeds 10 percent per year in LMICs (at such a rate, prices will double in seven years).

[3] FAO (2014b, 2014c) have helpful data on farm prices, but they are annual, not monthly.

[4] FAO estimates human food consumption as a residual within a food balance sheet that utilizes data on or estimates of production, imports, exports, stock changes, feed, seed, industrial and other uses.