

Synopsis: Grain price seasonality in Kebbi state, Nigeria

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RESEARCH OVERVIEW

Recent studies found the extent of food price seasonality in sub-Saharan Africa to be two to three times greater than that observed on global markets. This implies that, despite decades of market liberalization in many countries, there remains much progress to be made to improve general food marketing conditions throughout Africa. This issue deserves research because the movements of prices during a crop year influence the consumption decisions of households, the production decisions of farmers, and the marketing decisions of traders.¹

A practical matter that emerges from these observations is what is the proper scale at which to study the issue so that policy interventions can be designed to successfully address it. In this study, we examine the behavior of prices in grain markets in various locations throughout Kebbi state, Nigeria. We propose that state and local agricultural policymakers can effectively implement projects to improve the general market environment and that price information can be used to determine the specific markets that are most in need of policymaker and donor attention.

BACKGROUND

Seasonality is the intra-annual movement in prices that systematically corresponds with the planting and harvesting cycle. The degree to which prices for a given crop experience sizable fluctuations within a crop year is related to the extent that markets meet demand through trade and storage.

If trade between markets occurs regularly, then the prices in a market are linked to prices in those markets with which trade occurs. If traders have the capacity and resources to trade, then, if trade becomes profitable due to a change in price in one market, then it will occur. Implementation of trade

will readjust that price back toward its prior level. Hence, trade stabilizes prices.

Likewise, storage, which allows supply in the current period to be carried over to the next, can stabilize prices, but only under certain conditions. Storage can reduce the probability of a steep price decline because consumers and traders increase purchases of grain to place into storage as prices decline. Similarly, storage can also reduce the likelihood of price spikes, since traders and farmers will sell their stored stocks when prices are rising – there is a lower likelihood of a steep rise in prices if there are stocks in storage available to sell.

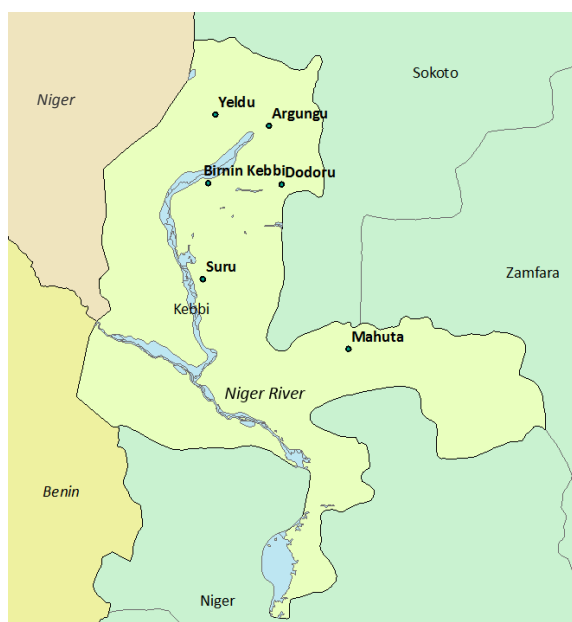
However, the ability to prevent price spikes is conditional on the availability of stocks to sell and the ability of traders and farmers to facilitate trade. In the presence of high transactions costs and marketing risk, market participation is lower, even when prices are rising. Consequently, prices will increase or decrease by greater amounts than they would if there were less risk and lower transactions costs in the market. Since some markets have better storage and other business services for trade facilitation than others, variations in the degree of seasonality can be linked to differences in market infrastructure.

DATA AND STUDY AREA

We examined the behavior of grain prices in Argungu, Birnin Kebbi, Doderu, Mahuta, Suru, and Yeldu markets in Kebbi state (Figure 1). Kebbi was chosen for this study because it has a unimodal rainfall regime and is drier than the southern coastal regions of Nigeria. As in other states in northern Nigeria, millet, sorghum, and other cereals are grown widely in Kebbi. The presence of the Niger River and its tributaries allows cultivation of irrigated rice and maize.

¹ A detailed discussion of this research can be found in NSSP Working Paper 51, *Grain price seasonality in Kebbi state, Nigeria* <http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/132722>

Figure 1: Kebbi state markets included in the analysis



The data used in the analysis are monthly price observations for maize, millet, local rice, imported rice, and sorghum in the six markets for the period January 2000 to December 2016. The price series were provided by the National Bureau of Statistics.

Regarding the characteristics of the markets examined, Birnin Kebbi is the administrative and economic hub of the state. Traders operating in Birnin Kebbi have greater access to business services than do those who are based, for example, in Mahuta, a relatively isolated rural market.

EXPECTATIONS

Based on the conceptual analysis and stylized facts outlined above, we expect:

- 1) Price behavior in Birnin Kebbi, the commercial hub, will differ from that in other markets;
- 2) Price behavior in Mahuta, the isolated rural market, will differ from other markets; and,
- 3) Less seasonality will be observed in prices for maize and imported rice than for other grains, since the two grains are more widely traded.

PRICE SERIES CHARACTERISTICS

Summary statistics – Imported and local rice had the highest price levels for the observation period,

while sorghum had the lowest. The largest mean levels differences across markets were observed for local rice and sorghum.

Data plots – All markets show a distinct rise in the imported rice price in early 2015 due to the sharp devaluation in the Naira exchange rate at that time. This rise in imported rice prices continued through 2016. Seasonal fluctuations were sharpest for local rice, millet, and sorghum.

Seasonal regressions – It is only for sorghum that the seasonal regressions, in which the mean price levels in the harvest period, pre-planting season, and planting season are compared to those in the lean season, showed statistically significant differences. Average pre-planting period sorghum prices are about 7 Naira/kg or 13-percent lower than those in the lean season.

Annual ranges of prices – Differences between the maximum and minimum price in a year that were greater than 10 Naira/kg were found much more consistently since 2010 than before, due in part to the devaluation of the Naira and higher nominal prices overall. Across crops, intra-annual ranges were lowest for maize and millet, and highest for imported and local rice. Across markets, average intra-annual ranges were lowest for Birnin Kebbi.

Frequency in directional changes – The prices in Birnin Kebbi also had the lowest total number of directional changes – a price rise in one period followed by a decline in the next, or vice versa. Thus, price movements in Birnin Kebbi are generally more predictable than in other markets.

POLICY RECOMMENDATIONS

The differences in behavior between prices in Birnin Kebbi, the commercial hub of Kebbi state, and other markets are likely related to market infrastructure. State-based price analyses can help policymakers identify the most isolated markets that need interventions, such as storage infrastructure investment and business service enhancements, to reduce price and marketing risk and facilitate greater market participation.

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