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## Policy brief: The extent and drivers of coordinated purchases and sales in Nigerian wholesale food markets

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### Introduction

When enterprises face high search costs (for accessing markets) or challenges bargaining with suppliers, they must find strategies to minimize these constraints (Rehme, Kowalkowski, & Nordigarden, 2013; Mabuza, Ortmann & Wale, 2014; Lang, 2020). One approach to minimize high search costs and bargaining challenges is coordination among enterprises in the same segment (e.g. among farmers or among traders). The alternatives to coordination are competing among the enterprises (for example, wholesalers or processors may give a better price to the farmers of higher quality produce to “capture” that supply from other wholesalers/processors in a market) or just to ignore the actions of other enterprises and proceed independently (for example, where a produce wholesaler or processor might just go to a farm zone and find whichever farmers are available and propose a price without first considering what prices other buyers are proposing).

There is already a rich literature and wide debate about the above noted coordination (instead of competing among enterprises) by farmer output marketing or input purchase cooperatives or organizations. These act as an intermediary (representing farmer members) to source from its member farmers, and either find, bargain with, and source from input sellers, or with output buyers, or both. While these are the actions and motives of these kinds of organizations, in practice there is great heterogeneity as to what extent the coordinate actions occur and lead to improved outcomes such as better prices or lower transaction costs for the members (see for example Abdul-Rahaman and Abdulai (2020) for positive results for rice coops in Ghana; compared with Sebhatu et al. (2021) that find mixed results, conditioned by structural and organizational factors in the cooperatives in Ethiopia. The literature on farm organizations and cooperatives features analyses of diffusion of these institutions, such as the studies cited above (which corresponds most closely to what

we analyze but for the case of traders, below), as well as assessments via case studies and surveys of cooperatives' performance in attaining the above objectives.

Far less common in the literature and development debates is the adoption of the above kind of coordination among wholesale market wholesalers. The rareness of analysis of the adoption of wholesaler coordination at least in developing country food systems is partly the fruit of a general neglect to date of the midstream segments of value chains (Reardon, 2015). It also seems to arise from the dearth of sample surveys on wholesale markets and on groups of traders within them. However, the activities of wholesalers (e.g. high costs of operations and decisions to ameliorate these costs) can affect the price farmers receive and the ultimate price and quality of food consumers get (Liverpool-Tasie and Parkhi, 2021). Failing to recognize the important role that these wholesalers play can undermine state, national or regional efforts to promote food security.

This brief presents a first-in-the-literature sample survey analysis of the adoption of the above kind of collective action by agrifood wholesalers in Africa. We analyze tomato, green leafy vegetables (GLV), and fish wholesalers across ~300 wholesale markets in Nigeria. Our focus is on adoption of coordination by traders. Due to data constraints, we do not analyze the outcomes of coordination where it occurs, that is, whether that coordination affected the prices they paid or received or their search and other transaction costs. However, using sample data to understand the extent and drivers of coordination in markets is in itself important but missing in the food systems literature, hence this study.

To fix in the mind of the reader what behavior we are analyzing we provide an example here of what could be the actions and motives of coordination among for example tomato wholesalers in a wholesale market in Nigeria. We also note how incentives for coordination could vary across decisions of product procurement (from suppliers) versus those of product sales to customers. First, coordination might, for example, be for the set of wholesalers to agree on and then to present a collectively determined price to potential farmer-suppliers or buyers as a means of gaining leverage with these suppliers or output buyers. The set of wholesalers might also, for example, collectively seek information about potential suppliers (e.g. planting and harvest times) or buyers (e.g. peak periods of operation) and make contacts with potential farmer-suppliers in various growing areas or customers in main consumption zones. These actions could potentially heighten the price bargaining power of the wholesalers and lower the search and contact costs with their suppliers and buyers.

At first glance, one might think that it is "natural" for traders in a wholesale market to coordinate their purchases to gain the above advantages, and that in reality one would observe this happening in all wholesale markets (particularly in developing regions with high transportation and other transactions costs) as a matter of course. We start with the observation that in Nigerian produce wholesale markets, diffusion of this practice is not common; that only a subset of markets have the market leaders undertaking such collective arrangements for traders, and with wide variation. That is, while coordination is often perceived as a natural solution to

address high search and logistical costs, the value and hence rationale for coordination rather than competition depends on several factors such as the location of an enterprise and the nature of the product being sold by the enterprise. For an enterprise located in a surplus region (where supply outweighs demand), the value of coordination to maximize sales is higher than for one operating in a deficit region where demand outweighs supply. Regarding product characteristics, the value of coordination is likely much higher for a commodity that is undifferentiated in the market than for a niche product with unique characteristics appealing to a subset of the market. Similarly, coordination is likely more important for perishable items compared to non-perishable items.

The impact of location and product characteristics on incentives for coordination can vary for product procurement versus sales. For example, while being in a surplus region might incentivize wholesalers to coordinate the sales of their products (to avoid a glut and price decline), they might be less interested in coordinating the purchase of the product from farmers given the high supply of the product in the region. On the contrary, among traders in a deficit region, there might be less incentives to coordinate sales because of the large demand for the product the traders face, but there could be a strong incentive to coordinate purchases to enable wholesalers compete with other wholesalers for the product (from both surplus and other deficit areas). Still within surplus and deficit regions, factors such as poor infrastructure, product perishability and logistical considerations are also able to affect incentives for coordinating either the procurement or sales (or both) for products.

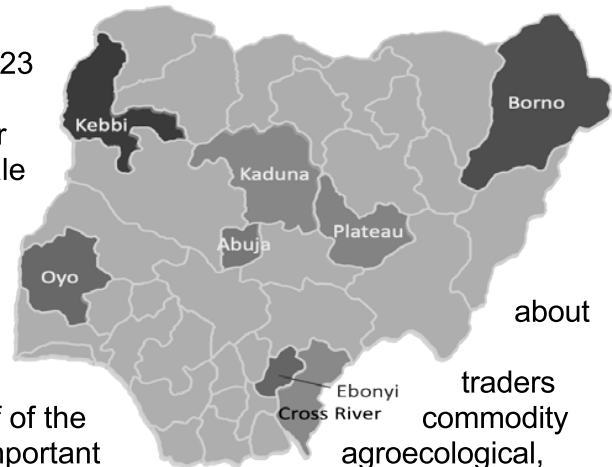
Despite the potential role of coordination in food markets, there are very limited studies on the prevalence and drivers of coordinated purchases and sales in these markets in developing regions and particularly across Africa. As far as the authors are aware, there are no empirical studies on the extent and drivers of coordinated purchases and/or sales in food markets in Africa using a large sample of markets. This study contributes to filling this knowledge gap by investigating the extent to which the market leadership in food markets provide the services of coordinated purchases and/or sales to food traders in wholesale food markets in Nigeria, Africa's most populous nation. Unique in this paper is our focus on governance structures within food markets as an institutional mechanism within markets to support traders in reducing search and other transaction and transportation costs rather than an analysis of individual traders coming together to coordinate their activities.

In this study, coordinated purchases is defined as taking place when the leadership (in a wholesale market) coordinates the purchases of products (on behalf of traders) from suppliers such as farmers (typically in main production areas of the country) and/or other markets. Similarly, coordinated sales exists where the leadership of product traders coordinates the sales of products (on behalf of traders) to buyers such as restaurants, processors and/or other markets typically in consumption areas of the country. As noted earlier, we consider coordinated purchases and sales separately given the possible differences in incentives for these different types of coordination.

We used data collected from a census of food markets where fish, tomatoes, or green leafy vegetables (GLVs) was sold wholesale across seven Nigerian states and Abuja, the Federal Capital Territory (FCT). The set of products considered in this study allow us to confirm if incentives to coordinate vary by product characteristics (i.e. among highly perishable products such as tomatoes and GLV compared to fish that is usually processed) and by location (major production areas versus largely consumption areas).

The data was collected between July 2023 and February 2024. The study sample consists of market level information for the entire universe of 299 wholesale markets that were found in the seven study states and Abuja. These 299 wholesale markets gave us 471 product level governance observations

the extent to which the institutional governance structure for product coordinate purchases or sales on behalf of the traders in the market. To capture important socioeconomic and cultural variation across Nigeria, we distinguish between trading and market characteristics in the core northern Nigeria (northeast and northwest), the Middlebelt (North central) and the south (southeast, southwest and south south). We analyzed the data collected using descriptive statistics supplemented by a regression analysis using the bivariate probit model.



### How common are coordinated purchases and sales? (by product and region)

Our survey results (See Figure 2) revealed five key points:

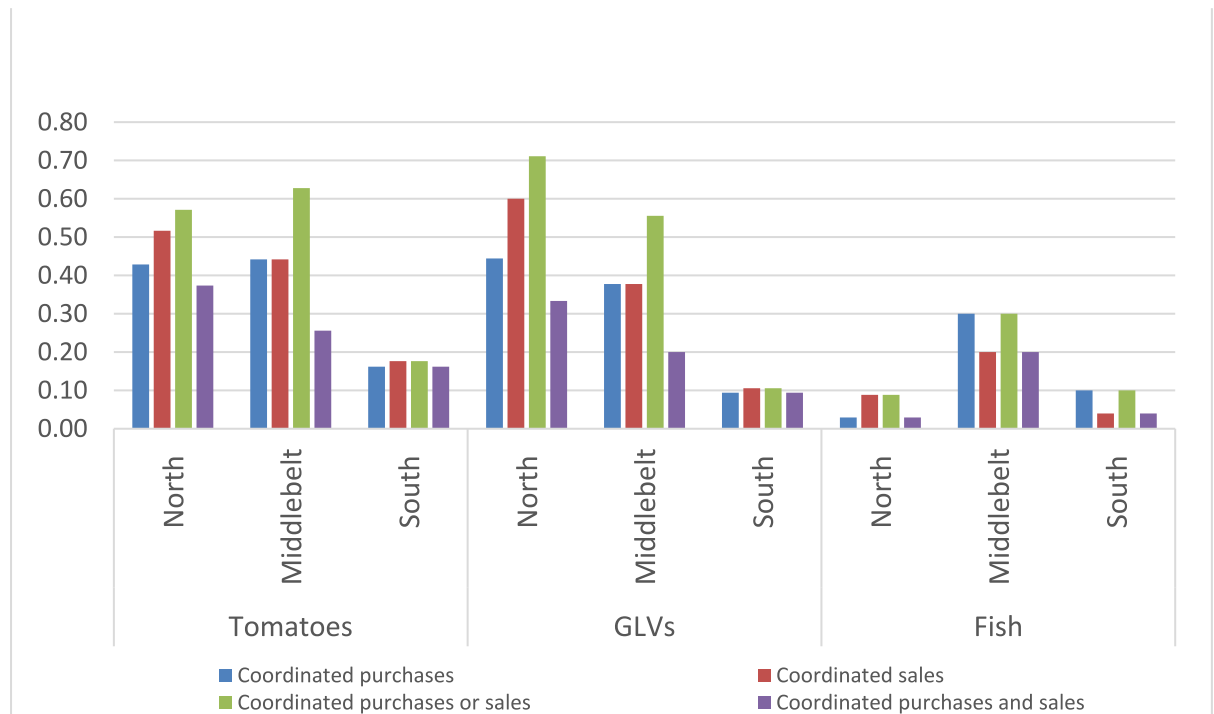
1. While the extent to which coordinated sales or purchases are provided by product leaders across all study markets appears low at ~35%, the provision of coordinated purchases or sales is very common among tomato and GLV wholesalers, particularly in the north. Coordinated purchases or sales are provided by approximately 60% each of tomato product associations/governance structures in markets in the core north (Kaduna and Borno) and Middlebelt (Plateau State). They are also provided by ~70% of the product leaders for GLVs in the core north and 55% in the Middlebelt.
2. The provision of coordinated purchases or sales by product leaders is more common among traders of horticultural products compared to fish. While coordinated purchases or sales are provided by 45% and 40% of the product leadership for tomatoes and GLVs respectively (across all regions), they are only provided by about 10% of the product leadership for fish. Again, in the north, this is 60% and 70% for tomatoes and GLV compared to 9% for fish.

Even in the south where coordinated purchases and sales are generally low, coordinated purchases and sales are more commonly provided by the tomato traders leadership (~20%) compared to fish traders (~10%).

3. Though coordinated purchases and sales (among horticultural product traders) is much lower in the south compared to the north, the provision of coordinated purchases and/or sales among fish traders is quite similar in the core north and south (~10%) but lower than the Middlebelt (Abuja) where 30% (3 of the 10 fish wholesale markets) provide coordinated purchases or sales for their traders.
4. We find that coordinated sales is significantly higher than coordinated purchases in the main producing states in the core north (~50% and 60%) for tomatoes and GLV respectively compared to coordinated purchases at ~ 40% each. This is consistent with the hypothesis that coordinated sales are more important in high supply regions compared to coordinated purchases, all else equal.
5. While coordinated purchases and sales are often likely to be provided together in the core north and the Middlebelt, this is not always the case. Sixty percent of the leaders of tomato traders provide coordinated purchases or sales (in the core north and Middlebelt), only about 40% (in the core north) and 25% (in the Middlebelt) provide both. A similar pattern (but with larger difference) is observed for GLVs. In the core north and Middlebelt, 70% and 55% of product leadership committees provide either coordinated sales or purchase, but less than half (~30% and 20% respectively) provide both. In the core north, these results appear to be driven by higher provision of coordinated sales. However, in the Middlebelt, while the share providing coordinated purchases or sales is similar for tomatoes (~45%) and GLVs (~40%), the share providing both is still lower indicating that both are common in the Middlebelt but not necessarily provided together.



**Figure 2:** The extent of coordinated purchase and sales by product and region



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## Key findings from the empirical analysis

From the descriptive statistics and econometric analysis, five key points emerged. We found that:

1. The incentives for coordination services are influenced by market dynamics (demand and supply), product characteristics, governance, and infrastructure, with varying impacts across regions and products.
2. The institutional provision of coordinated purchases and sales is significantly more in the Middlebelt and northern regions of Nigeria than in the south.
3. The provision of coordination services for traders is higher in markets where tomatoes and green leafy vegetables are traded compared to fish. This is consistent with our hypothesis that coordinated purchases and sales will be higher for more perishable products such as tomatoes and green leafy vegetables compared to fish. Most fish traders market dried and smoked fish which are easier to preserve (Liverpool-Tasie et al., 2021). The long supply chains (up to 1000 km from the north to the south) for tomatoes creates an incentive for coordinated logistics during procurement and sale.
4. Market governance structures affect the likelihood of coordination services. In markets with multiple-governance levels (and more opportunities for trader needs to be communicated), there is a 24 percentage point higher likelihood of coordinated purchases and an 18 percentage point higher probability for both coordinated purchases and sales. This is particularly the case in southern Nigeria. Within regional analysis reveal that in the north, governance structures with less hierarchies are important for coordination.
5. Markets with better infrastructure (e.g. ambient or cold storage) and with more wholesalers have a higher probability of coordinated sales while those with many retailers (a ready market wholesalers can access at minimum costs) reduce the probability of coordination.

## Policy implications and recommendations

A key contribution of this study to policymakers and donors is the provision of a method and perspective to determine whether and where there is coordination occurring in food wholesale markets. This is an important first step that governments and donors need to take in order to then determine whether investments or regulations are needed to enhance adoption of coordination where it provides positive externalities such as great market efficiency and consistency of food access or constrain it where it produces negative externalities like higher prices from collusion.

1. Market infrastructure (such as ambient storage and good roads/easy market access) reduce transaction and transportation costs which support more efficient coordination. Attention needs to be given to market infrastructure in food markets.

2. Governance matters but varies significantly across Nigeria's North, Middlebelt and South regions. Having more opportunities for traders needs to be communicated and minimizing possibilities for power hierarchies supports the provision of coordination services where needed.
3. Further analysis is needed to comprehend the significant variations in the presence of coordinated purchases and sales across different regions of Nigeria for similar products (e.g., tomatoes and GLVs) and the comparatively low usage among fish traders.
4. Additional studies are also necessary to evaluate the costs and benefits of these coordination services provided by market and product leaders. This understanding will help identify ways to support and enhance their use and benefits among food traders in Nigeria and other similar contexts.



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