RSM2SNF
Research Supporting African MSMEs To Provide Safe and Nutritious Food

Policy brief on the extent and drivers of coordinated purchases and sales of selected commodities in Nigerian wholesale markets

Babalola, Daniel, Liverpool-Tasie, Lenis Saweda O., Kolade, Yinka, Reardon, T., and Wineman, A.

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

BILL & MELINDA GATES foundation
MICHIGAN STATE UNIVERSITY
FSG FOOD SECURITY GROUP Collaborative Research and Capacity Building for a Food Secure World

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 and/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

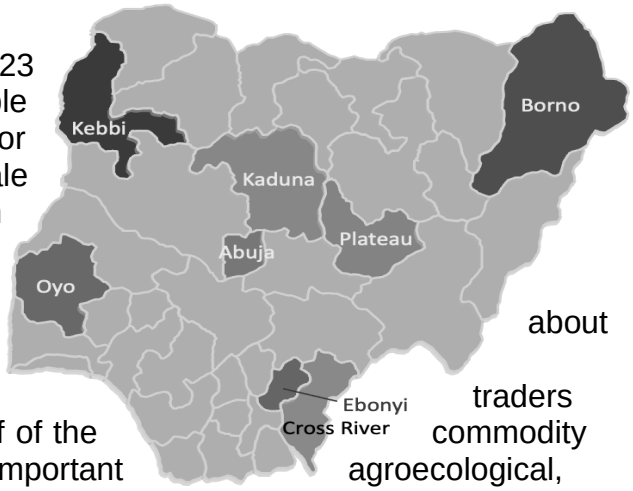
address high search and logistical costs, the value and hence rationale for coordination rather than competition depends on several factors such as the location of an enterprise and the nature of the product being sold by the enterprise. For an enterprise located in a surplus region (where supply outweighs 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 about the extent to which the institutional governance structure for product traders coordinate purchases or sales on behalf of the commodity traders in the market. To capture important agroecological, 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). 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 Table 1) revealed five key points:

1. While the extent to which coordinated sales and purchases are provided by product leaders across all study markets appears low at 35%, the provision of coordinated purchases and/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 and/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, 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%). However, coordinated purchases and sales are provided by similar share of product leaders for GLV and fish (10%) in the south; lower than tomatoes.

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.

4. We find that coordinated sales is significantly higher than coordinate 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 is observed for GLVs. In the core north and Middlebelt these differences are starker with 70% and 55% providing either of the coordinated services but less than half (~30% and 20% respectively) providing 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.

Key findings from the empirical analysis

From the descriptive statistics and bivariate probit analysis in this study, six key points emerged. We found that:

1. The institutional provision of coordinated purchases and sales is significantly more in the Middlebelt and northern regions of Nigeria than in the south.
2. The probability of coordinated purchases and sales is significantly higher in markets in production areas. This likely reflects the need for coordinated services in areas of product concentration to minimize losses.
3. The provision of coordination services for traders are 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. Though over majority of the study markets are in the area where the commodities are produced, the motivation to coordinate purchases is only about 10% in southern markets. This might be due to comparatively lower production in the south (especially for tomatoes) alongside huge demand, which makes it a deficit area where finding buyers is less of a challenge. In such a context, traders in the south are competing with each other for the products from production areas to meet the huge demand and thus have less of an incentive to coordinate.
5. The difference in use of coordinated purchase and sales in southern markets (compared to the north) might also reflect heterogeneous cultural norms. Though education levels are higher in the south, studies have found cultural norms in the south can often be resistant to changes in the way things are done (Darley & Blankson, 2008; Abdul-Quadri, 2024).
6. Markets with traders who are in the leadership at state and/or national level are more likely to have coordinated sales provided by the market leadership. This reflects increased opportunities for gaining knowledge about and access to coordination opportunities and markets more generally.

Policy implications and recommendations

Based on our findings, we propose three recommendations for consideration by policy makers and development partners

1. Information about the value and opportunities for coordinated sales should be extended to market leaders to expose more of them to the importance of coordinated purchases and sales. This is especially pertinent in the south and among fish traders.
2. Support for coordinated sales and purchases could benefit from additional studies to understand the benefits and challenges associated with product coordination in the Nigerian context.
3. Further studies are needed to better understand the significant variation in the presence of coordinated purchases and sales across Nigeria to inform why this institutional arrangement appears to be so common (about 60%) among horticultural products in the Middlebelt and north but is still present but much lower (10%) in the south, and among fish traders.

References

Abdulqadir, A B., & Ibrahim, G. U (2019). Agricultural Produce Distribution Network and Local Market System in Kaduna State, Nigeria Kaduna Journal of Postgraduate Research 2(2), 8-18.

Agham, C. C. (2014). Transaction Costs of Exchange in Agriculture: A Survey *Asian Journal of Agriculture and Development*. 11(1), 22-38

Abdul-Rahaman, A., & Abdulai, A. (2020). Farmer groups, marketing and smallholder farm performance in rural Ghana. *Journal of Agribusiness in Developing and Emerging Economies*, *10*(5), 511-527.

Coase, R. H. (1937). The nature of the firm. Economica N.S, 4, 386–405

Darley, W. K., & Blankson, C. (2008). African culture and business markets: implications for marketing practices. *Journal of Business & Industrial Marketing, 23(6), 374–383.* doi:10.1108/08858620810894427

FAO (2021). Food systems transformation: Modernization of wholesale markets and building back better food supply systems. COVID-19 Response and Recovery programme. Santiago. https://doi.org/10.4060/cb3459en

Kowalkowski, C., Kindstrom, D., & Brehmer, P. O. (2011). Managing industrial service offerings in global business markets. *Journal of Business & Industrial Marketing*, 26(3), 181-192.

Kucza, G. & Gebauer, H. (2011). Global approaches to the service business in manufacturing companies", *Journal of Business & Industrial Marketing*. 26(7), 472-483.

Lang, M. (2020). Consuming Perishable Goods in the Presence of Transaction Costs and Liquidity Constraints.https://are.berkeley.edu/sites/are.berkeley.edu/files/job-candidates/paper/Contracting_Electricity_LICs.pdf

Liverpool-Tasie, L. S. O., Sanou, A., Reardon, T., & Belton, B. (2021). Demand for imported versus domestic fish in Nigeria. J. Agric. Econ. 72, 782–804. doi: 10.1111/ 1477-9552.12423

Liverpool-Tasie, L.S.O., and C.M. Parkhi. 2021. "Climate risk and technology adoption in the midstream of crop value chains: evidence from Nigerian maize traders." Journal of Agricultural Economics 72(1):158-179.

Mabuza, L. M., Ortmann, G., & Wale, E. (2014). *Effects of transaction costs on mushroom producers' choice of marketing channels: implications for agricultural market access in Swaziland. South African Journal of Economic and Management Sciences, 17(2), 207–219.* doi:10.4102/sajems.v17i2.494

Reardon, T. (2015). The Hidden Middle: The Quiet Revolution in the Midstream of Agrifood Value Chains in Developing Countries. Oxford Review of Economic Policy.31(1), Spring: 45-63. https://doi.org/10.1093/oxrep/grv011

Rehme, J., Kowalkowski, C., & Nordigården, D. (2013). *Sales coordination and structural complexity: a national-international comparison. Journal of Business & Industrial Marketing, 28(6), 514–522.* doi:10.1108/jbim-04-2013-0097

Sebhatu, K. T., Gezahegn, T. W., Berhanu, T., Maertens, M., Van Passel, S., & D'Haese, M. (2021). Exploring variability across cooperatives: economic performance of agricultural cooperatives in Ethiopia. *International Food and Agribusiness Management Review*, *24*(3), 397-419.

Sheth, J.N., Sisodia, R.S. & Sharma, A. (2000). The antecedents and consequences of customer-

available in the full paper.

Table 1: The extent of coordinated purchase and sales by product and region

Tomatoes	**Overall**	**North**	**Middlebelt**	**South**
Share of tomato traders' leadership that coordinates purchases	0.34	0.43	0.44	0.16
Share of tomato traders' leadership that coordinates sales	0.39	0.52	0.44	0.18
Share of tomato traders' leadership that coordinates both purchases and sales	0.28	0.38	0.26	0.16
Share of tomato traders' leadership that coordinates either purchases or sales	0.45	0.57	0.63	0.18
Number of observations	**203**	**92**	**43**	**68**
GLV	**Overall**	**North**	**Middlebelt**	**South**
Share of GLV traders' leadership that coordinates purchases	0.25	0.43	0.38	0.09
Share of GLV traders' leadership that coordinates sales	0.29	0.59	0.38	0.11
Share of GLV traders' leadership that coordinates both purchases and sales	0.18	0.32	0.20	0.09
Share of GLV traders' leadership that coordinates either purchases or sales	0.37	0.7	0.55	0.11
Number of observations	**174**	**44**	**45**	**85**
Fish	**Overall**	**North**	**Middlebelt**	**South**
Share of fish traders' leadership that coordinates purchases	0.09	0.03	0.30	0.10
Share of fish traders' leadership that coordinates sales	0.07	0.09	0.20	0.04
Share of fish traders' leadership that coordinates both purchases and sales	0.05	0.03	0.20	0.04
Share of fish traders' leadership that coordinates either purchases or sales	0.11	0.09	0.30	0.10
Number of observations	**94**	**34**	**10**	**50**

Source: Authors calculation from survey data