

Linking Smallholder Maize Farmers to the Market for Poultry Feed in Nigeria: a Case Study

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Abstract

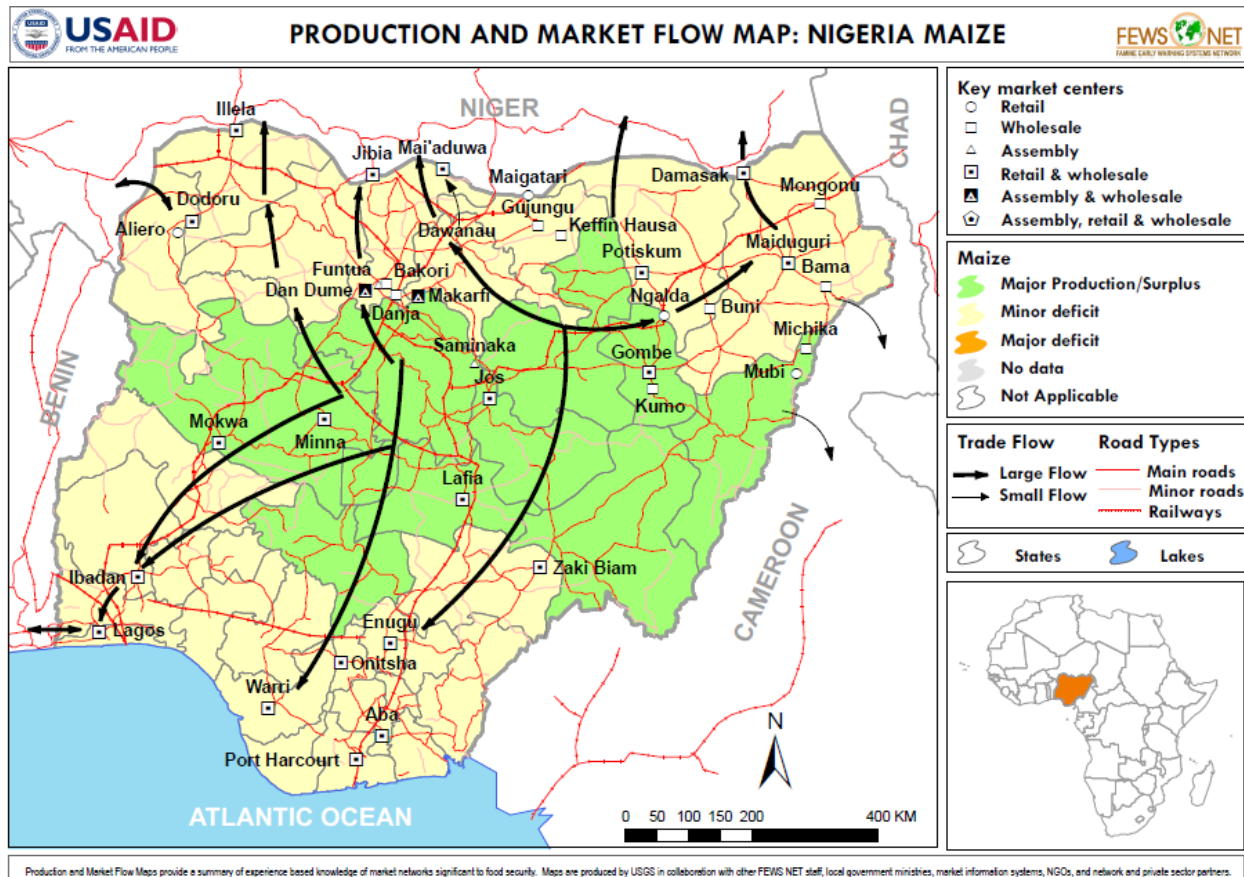
Maize plays a critical role in diets of millions of Nigeria and farming systems; it is consumed domestically and used for feed in poultry. The demand for poultry and eggs continues to rise as Nigeria's economy grows (Killebrew et al 2010). In response to the demand, there has been rapid expansion of poultry farms, particularly in southern Nigeria, where income growth, and hence demand, has been fastest. Given the rapid growth of poultry production in Nigeria, one question that arises is whether smallholders are facing increased demand for the feed grains that they produce. This study seeks to identify the types of coordination strategies, if any, that exist between these small holders and poultry producers. This paper hypothesizes that poultry farmers and feed millers are choosing to contract with larger farmers, thus estranging the smallholder sector from a potential engine of growth. A case study approach is used and results are reported based on interviews with over 100 participants (farmers, wholesalers, and poultry producers) in the maize-poultry value chain linking poultry producers in Southwestern Nigeria with maize producers in the north-central part of the country. This paper reveals that poultry farmers and feed millers do not contract with maize farmers but rather deal with a middleman, whom we call a wholesaler of maize. The wholesaler of maize contracts with larger maize farmers rather than smallholder farmers. Therefore, amongst the participants covered by this survey, the smallholder farmers are not directly benefiting from the increased demand of feed grain, but they may benefit indirectly to the extent that the increased demand raises prices in the spot markets where they sell.

Introduction

As incomes rise, so does the demand for animal protein, and this has led to the growth of the poultry sector in Nigeria. The Nigerian poultry sector generates about a quarter of the

Agricultural Gross Domestic Product of the Nigerian economy (PAN 2015). In 2013, commercial poultry production in Nigeria was estimated at USD 800 million; the sector employs over 14 million people directly or indirectly (PAN 2015). In addition, rural family poultry production has an estimated 85 million people involved in managing a total asset base of about USD 1.6 billion (PAN 2015). For poultry farmers and feed millers, one of those key products is maize. The majority of the commercial poultry farmers are located in the southwestern part of Nigeria. The maize used in poultry feed is sourced mainly from the mid-northern region of the country (from and just north of the Middle Belt), located approximately 800 km from the main poultry production areas of the southwest (figure 1).

Figure 1: Production and Market Flow Map: Nigerian Maize



Most of the major poultry farmers and feed millers serving the Lagos market are located in Ogun, Lagos, Oyo and Osun states. The wholesalers take on the risks to travel to the main

maize-producing areas of the north, make arrangements with maize farmers and also grow maize themselves in an area commonly known as Nigeria's Middle Belt. The coordination of economic activities (for example, along a value chain) is a challenging problem when the decisions and actions that need to be linked are separated in time and space (Williamson 1987). While some poultry farmers in the south seek to vertically integrate by growing their own maize in the south, maize from the northern region is favored because it is properly dried and can be stored for longer periods of time. Maize grown in the south is often not completely dried because of the moist conditions in the south, leading to mold and storage problems. This paper seeks to investigate why and how did the various partnerships linking smallholder grain farmers in the north to the poultry sector in the south come about. What contractual relationships exist between farmers and wholesalers? Due to the qualitative nature of the data, it is difficult to assert traditional research hypotheses in clear quantitative terms. Nevertheless, the primary questions driving this present research are very much guided by Transaction Cost Economics (TCE).

Conceptual framework

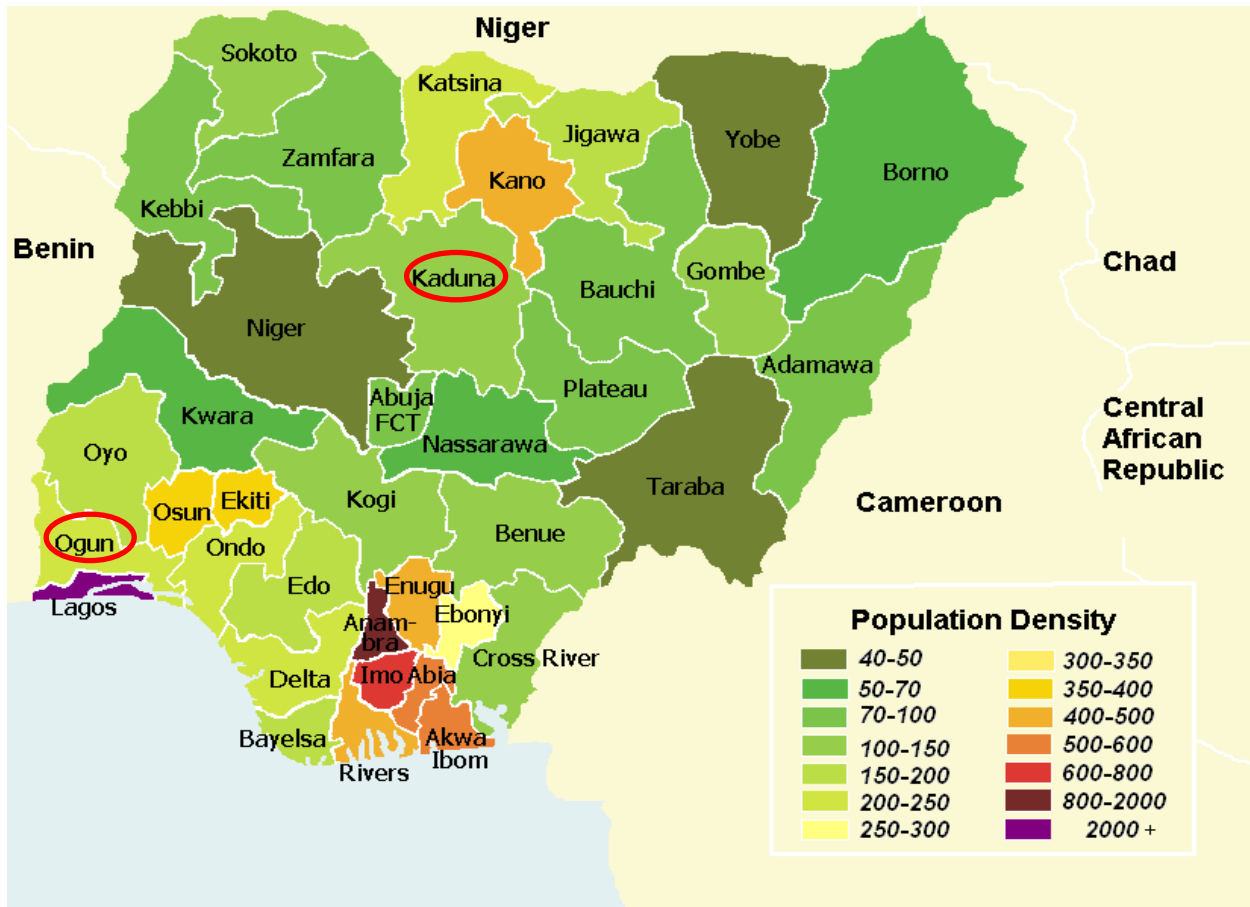
Transaction cost economics (TCE) contends that there is some cost to using the price mechanism to coordinate economic activities in imperfect markets (Coase, 1937). These costs arise from incomplete and asymmetric information, bounded rationality and opportunism (Williamson, 1981; 1989; 2000). TCE theorizes that firms and inter-firm contracts are governance structures that occur as a consequence of transactions costs, in a struggle to minimize costs through the establishment of rules by which exchanges are to be administered (Coase, 1937). Foundational work in transaction cost economics and new institutional economics has provided a theoretical framework which describes the nature of these transaction costs and risks, and which explains how a continuum of vertical coordination strategies (VCC) can theoretically address these problems. The decision-making framework for transaction cost will be based on Williamson (1979, 1985). The factors that play a role in transactions costs are asset specificity, uncertainty, frequency of transactions and externalities. Major focus is placed on the asset specificity problems (Jaffee 1995). Asset specificity could be

site specific, physical, capital, temporal and human capital. In transaction cost economics, the more specific an asset is, the more likely it is that vertical integration or some other form of tight vertical coordination is optimal.

Materials and Methods

The study used a case study approach as a research method. It allows a focus on the cases and retains a holistic and real-world perspective (Yin 2014). The approach allows for the investigation of the boundaries between transaction theory and the contractual relationships of smallholder farmers. The approach helps in this distinctive situation where there are more variables of interest than data points. It relies on multiple sources of evidence and benefits from the prior development of transaction theory to guide data collection and analysis (Yin 2014). It can also offer insights not provided by random controlled experiments.

Figure 2: Map of Nigeria, with survey areas highlighted



The majority of the poultry farmers serving the Lagos market are located in Ogun State in the southwestern part of Nigeria (just north of Lagos). The proximity to the Lagos markets for eggs and poultry meat makes it suitable for poultry farmers. Also, the temperature in the region is ideal for poultry farming, not exceeding 90°F. The maize used for poultry farming is sourced from the mid-northern region, with our surveys taking place in Kaduna state, in the north of the Middle Belt (figure 2). This region is savannah land, along with heavy sun and drier weather, but still annual rainfall on the order of 1200 mm/year, which makes it ideal to grow maize.

The maize from the Kaduna region is favored because it is properly dried and can be stored for longer periods of time than that grown in the south. Hence, the majority of the feed mills and poultry firms in the south prefer the maize from the north. The data collection started from the

poultry firms in Ogun State then moved along the value chain to the maize-producing areas in Kaduna State. It was an enormous task that was achieved given the security challenges in the northern part of Nigeria, limited resources, challenging infrastructure and language constraint. The case study was conducted from August 3rd 2015 - September 4th 2015. We had 25 working days to conduct the research and because of time and logistical constraints, the study had many aspects of a reconnaissance study. The poultry firms studied were engaged primarily in production of eggs, not broilers.

We sought to understand the contractual relationships that these poultry firms have with actors in the value chain. The team administered surveys to seven poultry firms and 1 feed miller in Ogun State, 100 maize farmers in Kaduna State, and 3 maize wholesalers who linked the maize farmers of Kaduna with the poultry producers farther south. The data collection approach relied on surveys and interviews for qualitative and quantitative data. We interviewed wholesalers of maize extensively to gain a better understanding of their roles in the value chain. Through the interviews we were able to understand if there are consequences tied to breaking the agreements. The case study collaborated with the Federal University of Agriculture Abeokuta Ogun State, YABA Institute of Technology Lagos State and De-Rissi Company.

The team was comprised of the owner of De-Rissi Company, a local farmer from Kaduna State, a research assistant from Ogun State and the author (Obafemi Elegbede). The team developed a plan on the best and safest way to collect data from the farmers while striving to have a diverse sample size. The local farmer on the team intentionally picked two markets in which he had contacts (in the Kubau and Kara local government areas of Kaduna State). In these markets, we interviewed 10 farmers. In addition, as described below, contacts with other actors resulted in our conducting 90 other farmer interviews in another area of Kaduna State as well as interviews with two other wholesalers besides De-Rissi Company.

One of the top producers of maize in Kaduna State, Alhaji Salisu with Mai Masara and Son Ltd, lives in the Soba local government area, which had a population of 293,270 in 2006 according

the census carried out in that year. He is both a farmer and an aggregator/wholesaler, buying maize from other farmers and then selling that maize and his own to wholesalers who ship it south. Since he is the one the highest maize producers in the state of Kaduna, he has access and influence in his local government and the state. He provided access to the farmers in his community along with a safe location (a local school) to perform the interviews. He was able to organize farmers at the location, and then we were able to conduct the farmer interviews. Twelve of the farmers interviewed had a strong relationship with this wholesaler/aggregator, while the remaining were members of the community who voluntarily participated in the interview process. The team didn't perform a listing in the community due to the size of the team, limits on resources and security concerns. However, the team was still able to perform interviews with 90 farmers. The interviews with the farmers were in-depth, semi-structured in nature and conducted in a school classroom.

Finally we conducted interviews with other buyers of maize. From rapid reconnaissance, we were able to identify the major wholesalers of maize in the state, described in more detail below. The team was able to interview three wholesalers but couldn't do more because of our close relationship with several wholesalers; other wholesalers felt threatened and did not trust us.

Description

The degree to which assets are specific to a particular product or transaction by the feed millers, wholesalers of grain and poultry farmers is not solely decided by choice but also the technology of production involved (Williamson 1979, 1985). The poultry farmers have to search for suitable wholesalers of maize, and then the wholesalers search for suitable farmers. This process involves significant transaction costs to ensure the process is executed. These costs are associated with the buying, selling and transferring of maize from one actor to another. Furthermore, were poultry farmers from the south to attempt to source maize directly from Middle-Belt farmers, they would incur costs from quality checks of goods, comparing to alternative maize in the south, agreements with the multiple farmers to meet their demands

and monitoring the partnerships. Furthermore, given the distances (both physical and social) and security risks involved, poultry farmers cannot easily vertically integrate backwards to grow maize in the north. The costs incurred from the actions are too high for poultry farmers, which leads to wholesalers of maize assuming the risk of search costs, transportation costs, monitoring, contractual agreements, quality check and security risks. McMillan (2002) describes the emergence of such traders as the rise of middlemen to meet the inefficiency of the market. The VCC partnership in Nigeria that is the focus of this case study consists of maize farmers, feed millers, wholesalers of maize and poultry farmers. However, it suffers from lack of formal contracts, credit constraints, and infrastructure challenges. In addition, due to the security challenges of working in the North, only a limited number of wholesalers (those with good connections in the North) are willing to take on this activity. Since major poultry farms are based in the south, they depend on these wholesalers to get their maize.

Poultry farmers are subjected to price risk because they do not have insurance and cannot hedge. They are also susceptible import pressures and wholesalers demanding higher prices for their maize. However vertical integration doesn't happen with poultry farms because of the risk involved in growing maize in the north and preferences for southern maize is low.

Poultry Farmers and Feed Millers

Poultry farmers and feed millers have assets specific to the poultry, as they are more committed to making feed, poultry and eggs. Some of the firms interviewed have equipment used to mix feed, and they all have generators to provide power for equipment and fans used to cool the layers. Coordination error is costly to poultry farmers and feed millers; in addition they face price risk from wholesalers of maize. The wholesalers can store the grain and sell when the prices are high; on the other hand, if the poultry farmers and feed millers have enough capital they can buy grains when prices are low for use when prices are high. The transaction can occur but at the cost of tying up their capital, which might have a high opportunity cost. Upon delivery of the maize, the feed millers and poultry farmers check the grain to ensure quality. They hire an independent lab to conduct tests on the maize before it is

offloaded from the truck. If the maize fails the quality tests, they do not make payment and it is always returned to the wholesaler. In some cases, the wholesalers of maize of obtain maize from large maize farmers on credit, so if the maize is returned, then the farmers will incur majority of the losses. Given the informal agreement between wholesalers of maize and poultry farmers and feed millers, the test is the only way they can enforce quality of the grain. Therefore, the wholesalers and the large maize farmers have an incentive to provide quality grain from the beginning of the value of chain. We discovered the poultry firms and feed centers located in the southwest only have a relationship with wholesalers of maize, not with maize farmers. We surveyed seven poultry farms and one feed miller, all located in Ogun state.

Table 1. Sample characteristics of Poultry Farms interviewed

<u>Name</u>	<u>Layers (# of birds)</u>	<u>Consumption of Maize Monthly (Tons)</u>
Korex Farms	23,000	77
Deflo Farms	7,000	23
Ayanleye Farms	13,000	43
Pattered Agro Ventures	5,000	17
Golden York Farms and Feed Miller	30,000	100
Fortune Heights Limited	200,000	672
Binta Farms	1,000	3

Korex farm is a medium poultry farm that has about 23,000 layers; it consumes about 720 tons of maize per year and produces about 9600 eggs per day. Fortune Heights Farm Limited is the second largest poultry farm in the region. The farm currently has 17 laying houses and it produces about 210,000 eggs per day. The farm continues to expand through construction of new pens for chickens to meet the demand for eggs. Given its rate of growth, the operation is on pace on becoming the largest poultry farm in Ogun state by next year.

Most of the farms supply eggs to about three different states in the south part of Nigeria namely, Ogun, Lagos and Osun states.

Figure 3. Diagram for flow of Supply of Maize

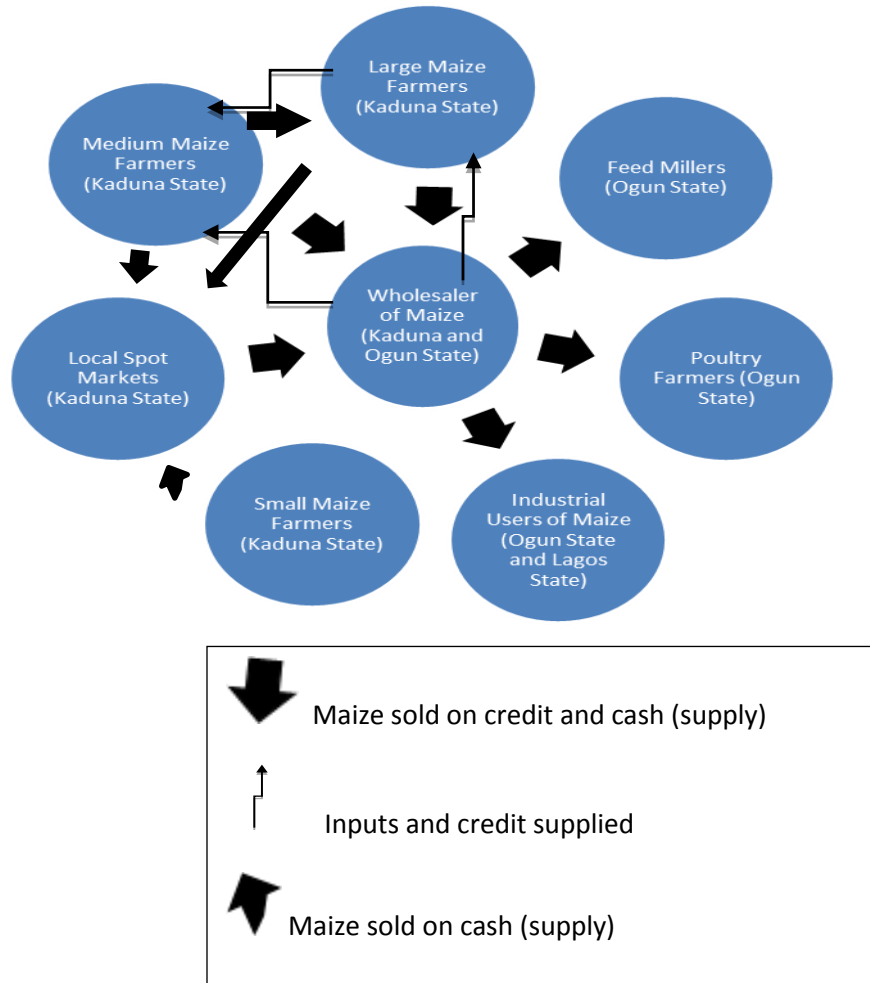


Figure 3 illustrates the flows of grain, inputs and credit in the maize-poultry feed value chain that we studied. The wholesalers of maize are the focal point; they are connected to large maize farmers, medium maize farmers and local spot markets to receive maize. They also provide inputs and credits to both medium and large maize farmers. Note that there is no direct connection between wholesalers of maize and small maize farmers unless the wholesalers go to the spot markets to buy grain to meet any remaining amounts they need to meet their orders. The wholesaler of maize also supplies feed millers, poultry farmers and industrial users with maize on credit. There is also a relationship between large farmers and medium farmers. The large farmers supply medium farmers with credit and inputs in return for maize. The local spot markets plays a small role for wholesalers, small, large and medium farmers because it takes

time to aggregate the amount needed for demand. The wholesalers of maize save time by dealing directly with large and medium maize farmers.

Wholesalers of Maize

The wholesalers of maize have the least asset specificity in the value chain. They own warehouses, farmlands and human capital to aggregate the maize, their transportation of maize being outsourced. One of the firms interviewed, the De-Rissi Company, was using its assets for sorghum and millet as well as maize during the study period. Wholesalers can use their assets for sorghum, rice or millet. From the survey we were able to identify the major wholesalers of maize in the state of Kaduna. They are Spring Field Agro Ltd, Nal-Maco Nig Ltd, ATCO Enterprises Limited, Premier seeds, De-Rissi Company, Mai Masara and Son Ltd and a private wholesaler. We conducted extensive interviews with De-Rissi Company, Mai Masara and Son Ltd and a private firm.

The De-Rissi Company is a dealer of maize and sorghum, which has strong ties to both the north and the south. The owner has over 20 years of business experience in supplying grain to major users. The company has storage facilities in Kaduna and Ogun State. The company also owns about 50 hectares of land used to grow maize in Kaduna; the assets could also be easily deployed for sorghum or millet. The firm supplies Nigerian brewery, which is owned by Heineken N.V, about 510 tons/year of sorghum along with a small amount of maize. The firm has a formal agreement with the Nigerian brewery that indicates quality specification for sorghum. The firm supplies maize to poultry farms like Crown Feeds and Livestock; this farm has two farm sites with 3000 metric tons storage capacity and warehouses that can accommodate an additional 1000 metric tons of grain. De-Rissi provided about 60 truck-loads (approximately 1800 tons) of maize for Crown Feeds and Livestock, 150 tons for Fumman juice and 300 tons for Nestle in the last six months in 2015.¹ The company maintains tight quality controls because of the specification required from contracts with the Nestle, Nigerian

¹ Each bag of maize could weigh between 92 to 100 kilos. The trucks could contain anywhere from 300 to 310 bags so each truck weighs approximately 30 tons.

Breweries and Fumman. However, for the feed millers and poultry farmers, they only conduct a quick and random check of the bags of grain to ensure quality. The company picks a random bag, retrieves a sample from the bag then visually observes the quality. Since the wholesalers of grain are also farmers, they can determine from their agricultural knowledge and experience the quality of grain.

To source for the maize needed, the company uses maize produced from its own farm, supplies from Mai Masura & Sons and the spot market if needed. The company gets the majority of its supplies from Mai Masura & Sons because of the amount needed. It is not time-efficient for the company to go the market to source for majority of the maize then aggregate for delivery. The company pays Mai Masura & Sons slightly more for convenience and safety as compared to paying the lower market price at the spot market. There isn't a formal contract, just a strong informal agreement. Given the amount of money that De-Rissi is willing to spend, the company needs farmers that are reliable and have bank accounts. In the maize farmer survey described below, only 35 out of 100 farmers had a bank account. It would be difficult for De-Rissi to conduct business with the remaining 65 farmers because the company's buyer would have to carry large amounts of cash, which puts the company at security risks.

Mai Masara & Sons Nigeria Limited own about 3,000 hectares of a land, along with storage facilities, tractors and inputs. Before becoming wholesalers of maize, they began as farmers. Over time they became very reliable suppliers to wholesalers of maize, so that demand for their maize grew, and then company responded by becoming a combined farmer/wholesaler of grain. Based on interview and observation; it was one of the top producers of maize in the state of Kaduna in 2014. The company provides inputs, credits and capital to certain maize farmers. Based on the survey, these farmers are medium farmers that own between 30 to 200 hectares of land, and they provided about 21,110 bags (2,111 metric tons) of maize to the wholesaler over the year. Mai Masara & Sons Nigeria Limited, with about 3,000 hectares of land, produce about 4,000 metric tons of maize along with several other crops. The interview indicated that the company partners with 12 other farmers to whom they extend inputs on credit and who supply the company with maize. In terms of payment for the services provided, the wholesaler

deducts the value of the services from the price of grain at the market to those farmers to whom it has extended credit. The grain is then aggregated along with the company's own supply to meet the demand from wholesalers. If the demand isn't met, then the company goes to the market to get the rest of grain, paying the going market price for those quantities. Mai Masara & Sons supply most of their maize to De-Rissi Company and other wholesalers of maize. The company doesn't have direct contact with poultry farms, feed millers and companies that use maize.

The final wholesaler of maize interviewed was much smaller; the company had contracts with Guinness, some poultry farmers and feed millers. The company's owner is from Ekiti state, which is in the west part of Nigeria. Initially the company sold fertilizers to farmers as a business but because of poor track record in repayments they closed down the fertilizer business. Some of the difficulty in repayments could also be attributed to the owner coming from the west and lacking a social network for the company to enforce contracts. This limits the growth of the company as compared to competitors that could have an easier time due to tribal and religious similarities. The company had about 25 hectares of land along with storage facilities, tractors and inputs. The private wholesaler also extends credit to some farmers from whom they purchase grain. The company recovers credit by taking the average prices from three market places then deducting the value of inputs provided to the farmers. The company uses a statistical program it has developed itself to forecast prices. This wholesaler also aggregates just like the other wholesalers.

In terms of communication, the wholesalers for the most part send text messages for the orders and make payments via cell phone. They also incur risks from low security, high search costs of reliable maize farmers and uncertainty in transportation from north to south due to poor infrastructure.

Maize farmers

Since the majority of the maize is sourced from the north, we focused on Kaduna, which is one of many states that produce maize. Kaduna has 23 local governments and a population of about 6 million. We picked markets where a good number of maize farmers sell their grain.

Figure 4: Map of Kaduna, with sample areas highlighted



The farmers in the sample were from 3 out of the 23 local governments namely: Soba, Kara, and Kubau. The estimated population size of Soba is 293,000, Kara is 200,000, and Kubau is 282,000.

Table 2. Sample characteristics of farmers interviewed

Variables	Local Government		
	Soba	Kara	Kubau
Number of Farmers	90	5	5
Average Farm Size (hectares)	16	142	21
Range of Farm Sizes (hectares)	1-200	5-350	7-70
Number of Farmers/Informal Contracts	13	5	4
Number of Farmers/Non Contracts	77	0	1

Some of the farmers have low asset specificity because they can rotate other grains on the field, use storage for grains and farm equipment for other grains. All the farmers reported they can easily use their assets for other activities. Out of 100 farmers surveyed, 53 farmers have other agricultural activities like rice, yellow sorghum, soya-beans, tomatoes and groundnuts, while 48 do not have other agricultural activities outside of maize. Fifty-four farmers either have no assets or rent, while the rest of the farmers own at least own cattle, storage facilities, tillers, tractors and livestock.

Table 3 highlights some of the differences between farmers who have informal contracts with wholesalers and those who do not. Eight of twenty-two farmers who have informal contracts received inputs from wholesalers of maize. These farmers reported the size of their land to be from 30 to 200 hectares; they sell most of their maize to the wholesaler who provides them with inputs. Seventy-eight of the farmers surveyed sell their maize in the market, not having a formal relationship with buyers. The twenty-two farmers who sell regularly to wholesalers describe their relationships with the wholesalers as informal arrangements but firm. The interviews indicated that in some cases informal contractual arrangements are enforced through Sharia Laws. This is law is imposed by states in Nigeria that have a high Islamic population.

Table 3. Characteristics of Contracting Farmers vs Non Contracting Farmers

Contracting Versus Non-Contracting Farmers			
Variables	Informal Contracts	Non - Contracts	T-Test
Number of Farmers	22	78	
Average Farm Size	92	3	0.000*
Average Household Size	19	11	0.001*
Average Age	48	40	0.001*
Percent with Higher than Primary Education	41%	24%	0.148
Percent with Electricity	77%	92%	0.131
Percent with Ownership	100%	83%	0.024**
Percent of All land Devoted to Maize	27%	58%	0.005*
Percent with Improved seeds	64%	21%	0.002*
Percent Reporting Sales of All Maize	86%	40%	0.001*
Percent Receiving Assistance from Buyers	36%	0%	0.000*
Percent Receiving credit inputs from Buyers	36%	0%	0.002*
Percent with Bank Accounts	59%	29%	0.046**

*Statistically significant at a 1 percent significance level

**Statistically significant at a 5 percent significance level

The values of the variables in Table 3 differ between farmers who have informal contracts and those who do not at a statistically significant level (at the 1 percent and 5 percent levels) except the variable indicating electricity and higher than primary education . This can attributed to the discrepancies in how people describe their education levels and poor power infrastructure in Nigeria.

The average farm size of farmers with contracts is approximately 89 hectares as compared to 3 hectares for farmers without contract. Only 27 percent of the farmers with informal contracts devoted their whole land to maize as compared to 58 percent of non-contract farmers. Farmers with contracts are more likely to receive assistance, credits, own a bank account, use improved seeds and sell more maize. The average maize produced by farmers with informal contracts is about 116 tons as compared to 10 tons of farmers with non-contracts.

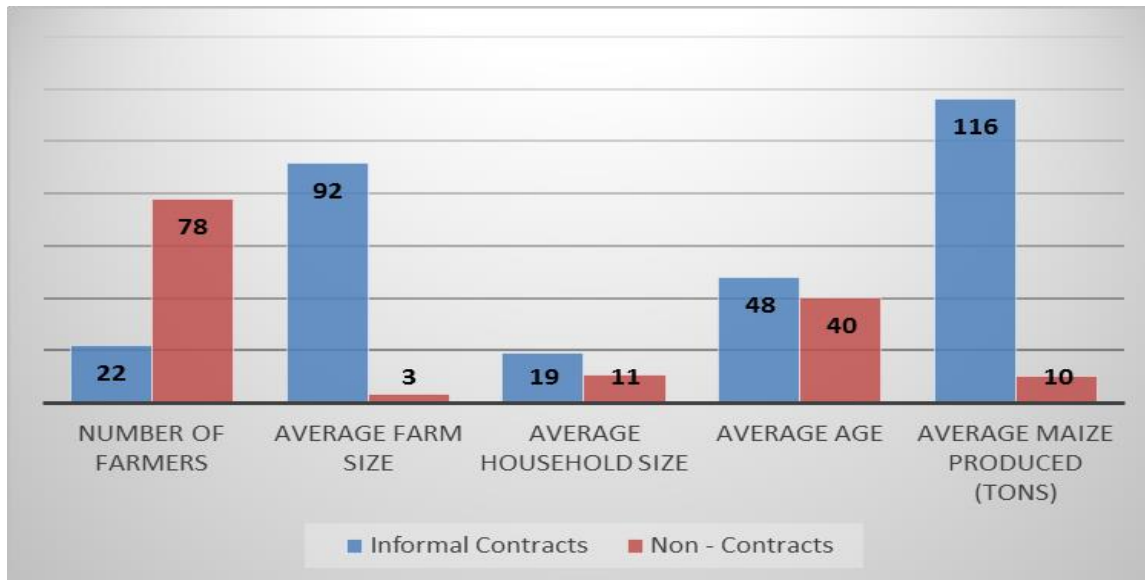
Table 4. Land Size and Average Yield

<u>Land Size</u>	<u>Average yield (Tons/Hectares)</u>
1 Hectare - 2 Hectares	5.9
2 Hectares - 3 Hectares	5.9
4 Hectares - 10 Hectares	5.5
11 Hectares - 25 Hectares	5.3
30 Hectares - 90 Hectares	4.6
100 Hectares - 350 Hectares	3.4

From the maize farmer's survey we can conclude that within our sample, farmers who contract produced 10 times more maize than farmers who did not contract. From the maize farmer's survey we observe that farmers who contracted on an average had larger farms, households, maize produced and were older. Within our sample, the 22 farmers with an informal relationship with wholesalers of grain supplied close to 2610 tons of maize compared to the 748 tons supplied to the market by 78 farmers with no contracts. The 78 farmers thus only supplied the market 22 percent of the grain sold among our sample.

However as the size of farm increased the reported yield decreased, contrary to expectations. This result may be the result of a lack of precision in the data concerning what proportion of their land individual farmers devoted to maize.

Figure 4. Characteristics of Contracting Farmers Vs Non Contracting Farmers



From the results we can infer that most smallholders supply the spot markets and large farmer supply wholesalers of maize through an informal firm contract. The large farmers also have low asset specificity towards growing grain; like small maize farmers, they have the option of growing sorghum, millet and rice. The large farmers incur a considerable amount of risk in the value chain because they are not guaranteed payment immediately from the wholesalers of maize. The wholesalers of maize collect grains from large farmers on credit and pay if the grain passes the quality checks for the customers.

Conclusion

We discovered that the smallholders have fewer opportunities for contracts due to quantity of grain, poor capital, credit constraints and market access. Transaction cost economics posits that as asset specificity increases, there will be a move away from spot markets to mediate transactions. For the poultry farmers and feed millers if the transactions costs are too high, then it is not optimal. However the transaction costs are too high so they depend on wholesalers of maize. Our hypothesis was that poultry farmers and feed millers are choosing to contract with larger farmers, thus estranging the smallholder sector from a potential engine of growth. From the study we were able to see that 100 percent of the poultry farmers and feed

millers are working with wholesalers of maize rather than contracting with large and small maize farmers. We discovered that wholesalers of maize would for the most part like to contract informally with large farmers and source maize from small farmers at the markets. We also discovered that large farmers also acted as aggregators for maize received from medium and, to a much lesser extent, small farmers. In some instances there were informal contracts between wholesalers and farmers; in return the wholesalers of maize provided inputs, credits and capital. For the most part, we found from our study that large farmers acted like wholesalers themselves but lack the ability to connect with poultry farmers and feed millers in the south.

Recommendations

If strong contracts were introduced it would be easier for large farmers to deal directly with poultry farmers and feed centers. For strong contracts to be enforced, there will need to be a strong judiciary system. In turn, if the small farmers could form a cooperative, they could aggregate their supplies and act as suppliers to poultry farmers and feed millers. However, as they have limited access to poultry farmers and feed millers, they will have to find a way to market goods downstream. The smallholder farmers can also contract with wholesalers of maize if they have higher yields and bank accounts. To increase yields the smallholder farmers will need improved seeds and fertilizers. Smallholders surveyed on average had 3 hectares of land. If they formed a cooperative they could aggregate and sell to the wholesalers of maize. However, there will be concerns of farmers side selling. De-Rissi Company suggested that instead of cooperatives, smallholder should form alliances with large farmers. The company believes there isn't any way to trust smallholders; because of their limited wealth, they are likely to take payments and not provide maize. However, the smallholders are loyal to large farmers because of similar religion, tribe and family ties. Therefore they are more likely to pay and receive goods

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