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Abstract

Using cross sectional data from all 47 Counties in Kenya, the presence of contract breaches between the producers and chain intermediary node is investigated. Most farmers do not engage in contracting and for those who do, many of these contracts are found to be informal. In addition, most of these contracts (whether formal or informal) were breached. However, some buyers appear to be associated with contract breaches. A distinct pattern emerges showing that larger milk producers are more likely to make formal contracts than small producers while the results also confirm that most of the contracts between farmers and individual consumers as well as traders and middlemen are informal and subject to contract breaches. Using a multiple correspondence analysis, these associations between contract breaches and farmer characteristics are explored. Results indicate that collective action institutions might encourage formalization of contracts while households that do not engage in some form of collective action engagements in most cases make informal contracts although both formal and informal contracts are equally subject to contract breaches. An examination of the underlying institutional, psychological and sociological drivers to contract breaches is recommended as such information can reveal how best to upgrade successful contract farming arrangements.

Keywords: Transaction costs, multiple correspondence analysis

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1: INTRODUCTION

Though dairy production in Kenya is the most commercialised in the Eastern African region, there are few production contracts at producer level linked to cooperatives, self-help groups, milk bulking/cooling centres and processors (Pelrine, 2009). With a share of almost 80% in raw milk supplies, small-scale farmers dominate dairy sector in Kenya. While only a small fraction of milk produced enters the formal market, the growth in demand for value-added dairy products, not only in the country but also within the East African Community (EAC), offers opportunities for making dairy farming more profitable for smallholders. To make this value chain more inclusive requires assurances of a stable supply of raw milk meeting food safety and quality standards, reduction in production and transaction costs thereby making raw milk supply a more stable and remunerative enterprise for smallholders. Many constraints confront smallholder farmers who often find it difficult to participate in markets for their products. Milk is perishable and bulky and moreover, in many occasions, producers cannot make short term investment decisions to cease production e.g. milk producers have already committed up-front investments and cannot easily abandon such investments at the drop of a hat. Low production by dispersed producers can also result in further power imbalances between buyers and sellers especially when producers act alone and have low access to market information. High transaction costs can also result from the lack of assured markets, high marketing costs (due to fragmented value chains), high costs of monitoring and quality assurance, high transport as well as dealing with contract breaches. Furthermore, seasonal volatility of raw milk supplies is pronounced due to predominantly rain-fed production system where many smallholders do not apply supplementary feeding mainly due to high feed prices.

Following the deregulation of milk prices in 1992, many milk marketing innovations emerged to complement the then state controlled Kenya Co-operatives Creameries. Compared to other commodities (e.g. maize) facing high price

volatility, the dairy sector stabilized somewhat though some volatility persisted with one of the main causes being weather related factors (Karanja *et.al.*, 2003). This can be further compounded by climate change which a study by Kabubo-Mariara (2008) suggesting that livestock enterprise choices can be influenced by climate change variables such as temperatures reducing the probability of farmers keeping dairy cattle and increasing the probability of holding beef cattle.

Contract farming (CF) involving forward agreements specifying obligations of partners in a business transaction can be an avenue for some to bridge these barriers or share the imminent risks present in production and marketing in uncertain environments. Contracts can be efficient in linking producers to markets and are also effective in integrating smallholders into mainstream markets (Costales and Catelo 2009). However, contracts per se are not a panacea for all these challenges though successful CF models share in a number of characteristics. These include being able to fairly share value between business partners who have a voice to influence key decisions, including business risks and rewards (Vermuelen and Cotula, 2010). In the dairy sector, some farmers have made such contracts with firms while other farmer groups are vertically integrated and have ventured into both processing and distribution of milk and milk products. However, this number is still small and still, many farmers still appear to prefer spot market transactions. Abdulai and Birachi (2008) identified three coordination mechanisms employed by producers and traders in the dairy value chain and showed that written contracts were sparingly used compared to verbal contracts and spot market transactions. They also demonstrated that the extent of advance price information as well as time taken to sell milk and physical distance separating players in the business transaction tend to influence the type of coordination mechanism chosen by market players. Fischer and Qaim (2011) also demonstrate that in the case of bananas in Kenya, more diversified farmers are less likely to market collectively though previous benefits from collective marketing positively influence their intensity of group participation.

Peer pressure from groups on the other hand can reduce behaviors such as side selling (Fafchamps, 2004) and trust based relationships nurtured over time can act as an enforcement mechanism (Fafchamps and Minten, 2001). In Kenya the success of the horticulture industry is partly attributable to CF and Hoeffler (2006) and Wainaina *et.al* (2012) argue that CF is beneficial to both potato and poultry farmers respectively. There is still debate about the definitive role of CF in Sub-Saharan Africa (see Oya, 2011) though CF is credited to have played a significant role especially during the immediate post colonial period in Kenya when tea and coffee farmers were able to form cooperatives to market their produce.

Cases of side selling outside the contract are real however, and which, from a firm's perspective, maintain supply risks for which contracts are entered into in the first place (Glover and Kusterer (1990). Reasons for contract breach include poor contract design, mistrust between contact partners or even contracts not made on sound analysis and planning by both parties. For instance, using an experimental approach on contract design in Vietnam, Saenger *et.al.*, (2012) show that although sanctions on farmers to produce milk of high quality can induce quality increases, they are not as effective as bonus payments. In another paper from that study population, a gender dimension suggests that female farmers decision to trust in a contract arrangement may be different from that of men—they are less likely to trust when the cost of trusting is higher (e.g. in the presence of collusion) but are more trusting overall (Torero and Viceisza, 2011). A number of research articles have also shown that trust improves the outcomes in exchange implying that contractual arrangements—especially verbal ones relying on trust can still function with little enforcement if trust is maintained between the parties in the contract (Fafchamps and Minten, 2001). Will, (2013) puts special emphasis on the importance of trust in CF relationships (see pp. 22, 25, 28). An information asymmetry advantage can be gained by sellers who if in long term interactions, can lower prices to some clients—who Granovetter, 2005a refers to as “known others”—a situation that can enhance

fragmentation of the market and inhibit formation of a single equilibrium price. Fehr and Schmidt (1999), Fehr *et.al.*, (2007) suggest that fairness considerations can also determine the presence of contracts if some societal members are inequality averse, which in turn has support from some insights from psychology such as loss aversion (see Kahneman 2003).

This paper briefly summarizes the contractual landscape for milk at the farm level and describes the relationship between milk producers and the business partners whom they supply raw milk. The paper goes further and attempts to make links between contractual failure and some business partner characteristics.

2: METHODOLOGY

Data used in this paper comes from a recent (2013) nationally representative sample of households in 47 counties commissioned by the Agricultural Sector Development Support Programme (ASDSP). A total of 12,654 farming households were interviewed after being selected using the proportionate to population size technique, based on the total number of farming households in each county. Actual data collection was performed by enumerators drawn from respective counties and who in turn were supervised by a county coordinator who oversaw their recruitment and training after going through similar introduction to the study objectives and tools. A structured questionnaire was used to capture data necessary for the exercise. This survey instrument was designed to capture a range of indicators for use by the ASDSP in its monitoring activities. Among the comprehensive list of parameters measured in this survey were household socio-economic characteristics, level of production and productivity for major agricultural and livestock commodities, consumption, marketing, and food / nutrition security, access to financial and insurance services. Following enumerator recruitment was a pre-test of the instrument after which actual data collection commenced in late September 2013 and ended in October 2013 while data entry was undertaken thereafter by clerks recruited and trained for the purpose.

In this paper, the authors explore for overt reasons and/or characteristics that maybe associated with contract breaches. This paper does however not try to establish the existence of different business models employable. Many studies on contract farming employ a transaction cost economics approach. This study does not take that route; rather, it relies on simple questions relating to the existence of contracts between milk producers and buyers of their product and tries to relate these variables to explore for patterns. The characteristics of milk producers (households) that may influence the choice of contract include membership to organizations/associations which other authors (see Shiferaw *et.al.*, 2006) suggest are important in overcoming some of the market failures. Such groups are a source of solidarity where members have a sense of moral economy and sense of group identity conferring a normative and extraeconomic meaning to economic action (Granovetter 2005b). Productivity of milk (measured by the amount of milk produced over the course of 12 months) is also used as a parameter where high production expected to force producers to gravitate towards contracting due to issues of bulkiness and perishability of milk (see Goldsmith, 1985 cited in Baumann, 2000, p.20). Milk production data for each household is estimated and ranked from highest to lowest from which four groups of equal frequency. The notion of bounded rationality comes into play since farmers are limited by the amount of knowledge they have when making the contract. Access to market information is important to farmers since it reduces risks in the way of making them likely to choose the best contract partner. Distance to output markets is used as a measure of the costs involved in bringing milk into the market. Respondents also gave responses about the partner with whom they made contracts with, the type of contract (whether formal or informal) as well as whether the contract was breached or not. Using this

information, the authors use an exploratory technique to explore and establish the nature of associations between these sets of variables. We employ Multiple Correspondence Analysis (MCA); a technique that can reveal latent patterns in complex data sets, thereby helping to describe these patterns geometrically by locating each variable as a point in low-dimensional space. To implement this analysis, we use the **FactoMineR** (Hasson 2007 quoted in Lê *et.al.* 2008) a package for multivariate data analysis with R (R Development Core Team 2014).

3: RESULTS AND DISCUSSION

Close to 47.3% (5,985) of the 12,654 respondent households produced milk from camels, cattle, goats or sheep. Of the milk producers, 16.7% had contracts for the sale of milk during the 12 month reference period. Many of these contracts were informal (64%) while the remainder were formal. These contracts were made between milk producers and cooperatives, institutions (public & private), traders, consumers, processors, hotels or even supermarkets. The most common parties with whom milk producers made contracts with included traders (hawkers, middlemen etc) and individuals; contracts that in most cases are informal. This complements the findings in many sector reports which show the informal milk marketing system to be handling most of the milk output. Cooperatives as well as milk processors make up another category of buyers who mainly made formal contracts with milk producers. Institutions (both private and public) as well as hotels also made contracts with producers though the frequency of these contracts was comparatively small (Table 1). Most of the contracts were breached (60%) while for the remainder, respondents said there wasn't breach of contract—although a portion of them were not committal with their answer or avoided it altogether.

Table 1: Number of milk sale contracts, types and the status of contract

Type of contract	With whom contract was made	Was contract honoured?		
		No	Yes	Silent ^a
Formal	Cooperatives	57	33	25
	Hotels	10	2	1
	Individuals	8	7	2
	Private institutions	6	1	2
	Processors	66	19	18
	Public institutions	5	2	2
	Traders	27	7	8
Informal	Cooperatives	20	6	11
	Hotels	38	9	6
	Individuals	105	52	42
	Private institutions	5	3	1
	Processors	14	1	1
	Public institutions	6	1	0
	Traders	139	42	38

^a Respondents failed to divulge the status of these contracts

Households contracting with private institutions (though a small number) produced an average 20,600 litres during the year whereas those selling to processors produced an average 14,700 litres during the same period. Those contracting with hotels on the other hand were producing 11,200 litres whereas farmers contracting with traders and hawkers were producing about 6,900 litres a year. Those contracting with public institutions and individual consumers were producing an average 5,600 litres and 4,100 litres on average. As shown on table 1 above, many contracts were made with individual milk consumers as well as traders and were mainly informal contracts.

Of these households that had some form of milk sale contract, majority (70%) did not have a member of the household belonging to an agricultural group/association during the preceding 12 months. Of those that had household members belonging to these groups, membership was dominated by produce marketing types (53%), while input access and marketing comprised 11% of these groups while the remainder were groups of various shades such as seed production groups, savings and credit, soil & water conservation groups, water resource management among others types. Slightly over half (54%) of the respondents with contracts had a household member accessing market information in the last 12 months

preceding the interviews. This is in contrast to a figure of 35% for all milk farmers in the sample signifying that households that have contracts go out of their way to obtain market related information. These results suggest that farmers who enter into contracts seek market information and are more likely to be engaged in common interest groups that have an interest in serving farmer's need for marketing assistance. Results from the MCA are summarized on figure 1 below.

- Quadrant 1: Contracts appear to be made by farmers who have the lowest production indices selling their milk mainly to individual consumers. These farmers in addition do not seek for market information and output markets are far⁵ from the farm. This group of farmers is also likely to be without representation in agricultural groups and many contracts are breached.
- Quadrant 2: Farmers enter into formal agreements with cooperatives and among this particular group of farmers; some of their household members

⁵ In this paper, we use a 35km cutoff radius to represent far-off markets while markets within this distance are assumed to be near.

participate in produce marketing groups.

- Quadrant 3: Farmers making contracts with private and public institutions as well as processors are informed (have access to market information) and this group appears to also have

comparatively higher production indices. These farmers have household members belonging to input access and marketing groups as well as other collective action group types.

- Quadrant 4: Farmers here make informal contracts with hotels and traders.

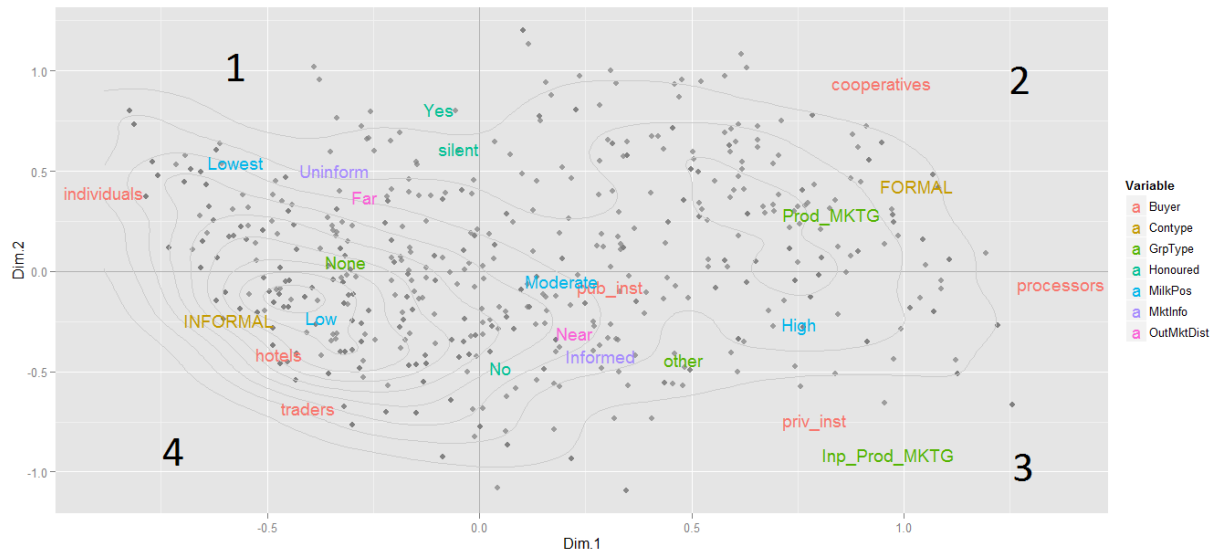


Figure 1: MCA plot of variables using R package FactoMineR

4: CONCLUSION AND RECOMMENDATION

These results provide a glimpse into the contractual landscape that describes the Kenyan case and suggests that contracts are entered into by farmers whose production is fairly higher than average. Contract breaches have an institutional dimension and do not depend much on the formality of the contract. The findings illustrate that informal and formal CF co-exist with none of the types guaranteeing more reliable compliance or featuring higher risks of default. Given the diversity of situations, business attitudes, farmer and buyer capacities, socio-cultural structures and local environments, it seems rather difficult to come up with a blueprint for designing farming contracts. On the contrary, agreements have to be negotiated case by case. Further studies utilizing data on psychological and sociological profiles of players engaged in milk market contracting (which would enrich the analysis) may be required to tease out the drivers of the patterns described in the paper. Results from the MCA

give interesting insights into structural particularities and possible success factors of different CF scenarios. While the prevailing situation in quadrant 1 suggests a need to promote the upgrading and up-scaling of existing informal CF as well as local cottage level value addition through capacity building measures, quadrants 2 to 4 lend themselves to a more in-depth assessment to identify good practices for up-scaling more CF agreements.

In conclusion, CF schemes will only be sustainable if both parties realise a profit (incentive for compliance) and if risks are shared with both partners working towards minimising risks of the joint CF venture. Experience shows that a farming contract is not worth being referred to as such if there is no trust between farmers and buyers and special attention has to be paid to assure fair give-and-take relations, open communication, transparent information and a fair voice for farmers in contract negotiations.

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