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# Governance structures and constraints along the Ugandan smallholder pig value chains

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## Abstract

Despite the numerous constraints facing the smallholder pig value chain in Uganda, it has been identified as one of the subsectors with high prospects for pro-poor growth due to the rising demand for pork and pork products. This paper focusses on the smallholder pig value chain governance structures and describes the constraints along the value chain. Awareness of the governance structure of the value chain is important in providing information on the types of interventions that can be targeted to the smallholder actors to upgrade their position in the chain. The findings show that the Uganda pig value chain is characterised by spot market transactions with limited contractual or hierarchical arrangements. Traders participate in horizontal collaboration to improve their competitive position in the value chain. The constraints affecting pig producers comprise pig diseases, low market prices for pig products, lack of reliable market and inaccurate estimation of pig weight at the point of sale. The live pig traders were the most powerful actors in the value chain but still faced challenges such as bad debts, high market prices and lack of enough capital while livestock feed traders predominantly mentioned presence of poor quality feeds in the market. Development of contractual relationships would help to tap domestic and export markets for pork products and reduce uncertainties. Besides, establishing proper breeding program and periodic training of farmers and drug stockists about new drugs in the market and animal husbandry practices would contribute to increased performance of pig industry.

**Keywords:** Smallholder, governance structure, transaction costs, transaction value analysis

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## 1. Introduction

Value chain governance refers to the relationships among the buyers, sellers, service providers and regulatory institutions that operate within or influence the range of activities required to bring a product or service from inception to its end use (Kaplinsky and Morris, 2001). Governance is about power and the ability of a firm to exert control at any point in the chain by setting or enforcing product or process parameters under which others in the chain operate. The key parameters of focus as indicated in value chain governance literature (e.g Dolan and Humphrey, 2000; Gereffi et al, 2005) include; what is to be produced, including product design and specifications, how it is to be produced, in terms of the production processes including elements such as the technology to be used, quality systems, labor standards and environmental standards, and how much and when it is to be produced, implying production scheduling and logistical arrangements. Value chain governance is pivotal especially for small and medium enterprises (SMEs) for better integration and coordination of their activities in value chains and improved performance. Information on governance structure of a value chain can provide governments, researchers and development practitioners with information that aids in identification and implementation of interventions needed to upgrade the value chain and improve the position of SMEs in the chain. Gereffi et al. (2005) posit five types of governance structures between actors at different points in a product value chain based on the complexity of information and knowledge transfer required to sustain a particular transaction, especially with respect to product and process specifications, the extent to which this information and knowledge can be codified and, the capabilities of actual and potential suppliers in relation to the requirements of the transaction. These include; spot-market, modular, relational, captive, and hierarchical (vertical integration).

Spot market governance involves normal transactions that require little or no formal cooperation between participants. The transactions are for specific deals with no expectation that the actors will transact again. In modular governance, suppliers make products to a customer's specifications, which may be more or less detailed. However, when providing 'turn-key services' suppliers take full responsibility for competencies surrounding process technology, and make capital outlays for components and materials on behalf of customers (Gereffi et al., 2005). Relational governance involves complex interactions between buyers and sellers, which often creates mutual dependence and high levels of asset specificity. This may be managed through reputation, or family and ethnic ties. Trust and reputation is key in this type of governance, especially where relationships are built-up over time. Captive governance structures occur when small suppliers are transactionally dependent on much larger buyers. Such networks are frequently characterized by a high degree of monitoring and control by lead firms. Hierarchy governance form is characterized by vertical integration (ibid.). The vertical linkages exist between actors with different market functions while horizontal linkages exist among the actors who have the same market function in a value chain.

The evolution and significance of value chain governance in promoting SMEs performance in the chains has attracted considerable attention of agribusiness and policy analysts. This study contributes to the literature on agri-food value chains by investigating the governance structures in the domestic pig value chains in Uganda. Pig production is increasingly becoming an important sector in Uganda, providing a major source of livelihood for more than 1.1 million households, and contributing to national food security. Fuelled by the increasing demand, the number of pigs in Uganda has increased from 0.2 to 3.2 million between 1980 and 2008 (UBOS 2009). With a projected annual growth rate of 8% over the

coming decade, the number of pigs in the country will come close to eight million by 2020. Most of the production is by smallholder farmers under backyard systems. Despite this growth, there is lack of evidence on the functioning of the value chain. Further, the study highlights elements for policy and regulatory actions with great potential for upgrading the value chain. The components of governance considered includes the relationships between pig value chain actors, quality standards for products and processes, government policies and regulatory frameworks and power relations that exist in the pig value chain.

## **2. Theoretical perspective**

### *2.1 Transaction Cost Economics Theory (TCE)*

In literature, the prevailing theory for explaining governance issues is Transaction Cost Economics (TCE) originally put forward by Coase (1937) and Williamson (1991) and further expanded by the proponents of the New Institutional Economics (NIE). TCE offers a set of normative rules for choosing particular governance arrangements (Masten 1993), which affects transaction costs economizing result (Williamson 1998). Generally, governance structure aims at mitigating all forms of contractual hazards found between the partners in order to minimise the production and transaction costs (Williamson 1979) In NIE literature governance structure has been defined as the institutional matrix that encapsulates the configuration of multi-stage business arrangements within a given strategic network (Sauvé 2002). Hendrikse (2003) indicates that a governance structure consists of a collection of rules or institutions and constraints structuring the transactions between the various stakeholders in the value chain. Notably, when the absolute value of transaction cost is expected to be high, the exchange partners will tend to apply a more intense and stable governance structure to reduce the transaction costs. Transaction cost economics is not only about managing transaction costs, but also the choice of organizational form that often vary according to the specific types of exchange activities. For example, hierarchical governance structure emerged due to market failures in less developed economies. However, high transaction cost can also be an entry barrier to smallholder farmers from participating in transaction/exchange or market. The choice of governance structure is mainly influenced by factors related to asset specificity, uncertainties – both either behavioural or environmental that should be analysed together and not in isolation (Grover and Malhotra 2003; Ji et al. 2012).

Asset specificity is the transferability of assets (physical and human resource) that support a given transaction. Transactions not supported with high asset specificity are prone to hold-up problems making the market players to opt for low cost governance structure. Behavioural uncertainties include performance evaluation and information asymmetry problems including bounded rationality. Bounded rationality and opportunism are two important assumptions of TCE which show that it is costly to identify untrustworthy individuals *ex ante* (Williamson 1996) and further indicate that all exchanges are costly. The market actors are rationally bounded (there is incompleteness and asymmetry of information) and tend to be opportunistic. Under these two conditions, market transactions are characterised by hazards thus measures must be taken to mitigate the losses arising from high market transaction costs.

Due to uncertainty the exchange partners may find it difficult to write market contracts, leading to opportunism. Therefore, the governance of exchange agreements between economic actors is costly and governance forms/structure varies depending on the ability to facilitate exchange and the attributes of transaction environment (Leiblein 2003). This may make the partners to use internal governance structure that minimises transaction costs such as communication, negotiation and coordination costs. The TCE approach is not however without criticism from other schools of thought such as *Transaction Value Analysis* (TVA)

proposed by Zajac and Olsen (1993). The TVA emphasize on maximizing the joint transaction value between the exchange partners while TCE on minimizing the transactions costs for exchange.

## *2.2 Transaction Value Analysis (TVA)*

The proponents of TVA argue that TCE focus on cost minimizing and provide little insight into strategic marketing choices that are undertaken by exchange partners who create and claim value (Zajac and Olsen 1993). TCE is considered static and structural, neglecting the fact that the choice of governance structure is actually a dynamic and process issue. Besides the mainstream economists criticize TCE for its lack of mathematical models to support the reasoning and contribute to testable predictions (Ménard 2001). TCE holds the joint transaction value constant while TVA proposes that it is appropriate to hold transaction cost constant rather than transaction value which it is claimed to maximise joint value of the two (more) exchange partners/economic agents (Zajac and Olsen 1993).

In this regard, TVA emphasizes on the co-effect of transaction costs and transaction value of governance structure choice. For example if transaction value (TV) creates higher transaction costs (TC) and expected joint gains outweigh transaction costs considerations, then the exchange partners having greater joint value will typically require the use of less efficient governance structure according to TCE perspective. This means that TC and TV are changeable variables and none of them can be held constant and that TV also influences governance structure<sup>†</sup>. According to TCE, a governance structure characterised by high transaction costs is considered inefficient but it can be chosen as long as it has higher joint transaction value. However, there is a debate about how to efficiently measure transaction value but Ji et al. (2012) defined it as the collaboration advantages achieved through transaction (mutual activities) of economic agents in the supply chain. The mutual benefits from a transaction entail logistic systems, cash response, information exchange (price, buyers and suppliers location etc), technology, innovation and quality management. Therefore, combining the TCE and TVA approaches as theoretical frameworks, this paper identifies the dominant governance structures in the Ugandan smallholder pig value chain.

## **3. The Data**

The data employed in this study are from pig value chain actor benchmarking surveys that were conducted between April and August 2013 in Masaka, Kamuli, Mukono and Kampala districts. Random samples of 376 pig farmers, 86 pig traders, 36 veterinary drug stockists and 36 livestock feed traders were used. The samples were drawn from lists of each value chain actor category prepared by local council authorities from 14 sub-counties in the 4 survey districts. Survey tools were developed to capture information on characteristics of the actors in particular the types of assets held, purchase of inputs and intermediate inputs in terms of cost, origin, supplier types, contractual relations, value addition using inputs and technology, and marketing of outputs in terms of prices received, geographic destinations, buyer types, quality attributes, as well as value chain finance. The survey tools were administered by qualified and trained enumerators using in-person questionnaire interviews in local language of the value chain actors. Qualitative focus group discussion data from 1400 randomly selected pig farmers were also used to complement the producer level data.

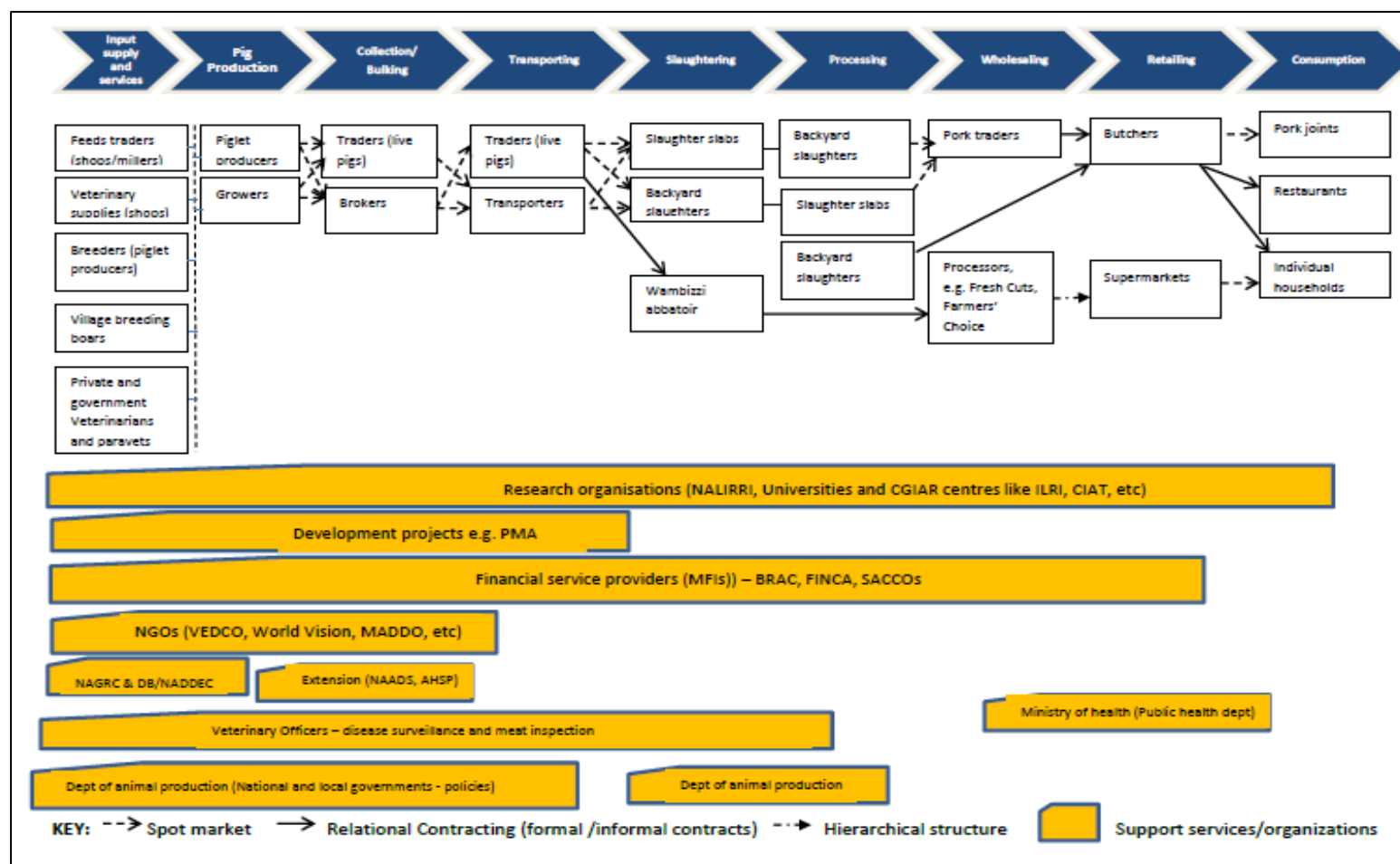
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<sup>†</sup> The governance structure is not based only on the cost but also by the joint value expected to be achieved by the exchange partners.

#### 4. Results and discussion

Most relationships in the pig value chain are based on “arm’s length” spot market governance structure (Figure 1). There are several smallholder pig farmers selling pigs for slaughter to live pig traders or brokers through uncoordinated spot-market transactions. There are no standards to adhere to and low barriers to entry. Due to lack of designated slaughter facilities, in both rural and urban areas, the pigs are largely slaughtered through backyard slaughters that are not regulated, and resulting pork, sold through local retail outlets such as pork joints, not inspected (Tatwangire, 2014). There is only one officially recognised and regulated pig slaughterhouse located in the capital city in Kampala, known as Wambizzi abattoir. Due to repeat transactions, informal contractual relationships through a relational type of governance structure exist between the abattoir and traders supplying pigs for slaughter. The abattoir is also the main supplier of pork to the processing firm “Fresh Cuts” that targets high end consumers for its processed products. The high end consumers demand for high and consistent quality pork products through the supermarket chains. The control of supplies through such chains is a factor of competitiveness and the linkages between Wambizzi abattoir, “Fresh Cuts”, and the supermarket chains is formalised through contracts.

The value chain map also shows input suppliers comprising livestock feed traders, and suppliers of veterinary products and services. Their relationship with the chain operators especially pig farmers is mainly on spot market basis. A number of policies are in place such as the *National Animal Feeds Policy (2005)* to govern the processing and sale of compounded animal feeds aimed at developing the animal feeds industry to further improve animal production and productivity. The policy emphasizes the importance of the private sector in spearheading the supply of quality animal feeds. Nevertheless, constraints associated with poor quality feeds due to adulteration still abound. The Draft Bill (legal framework for implementation) of the policy has not been approved to provide a legal framework that is vital in guiding feed compounders and traders, and regulators in the feed sector.



**Figure 1:** Pig value chain map

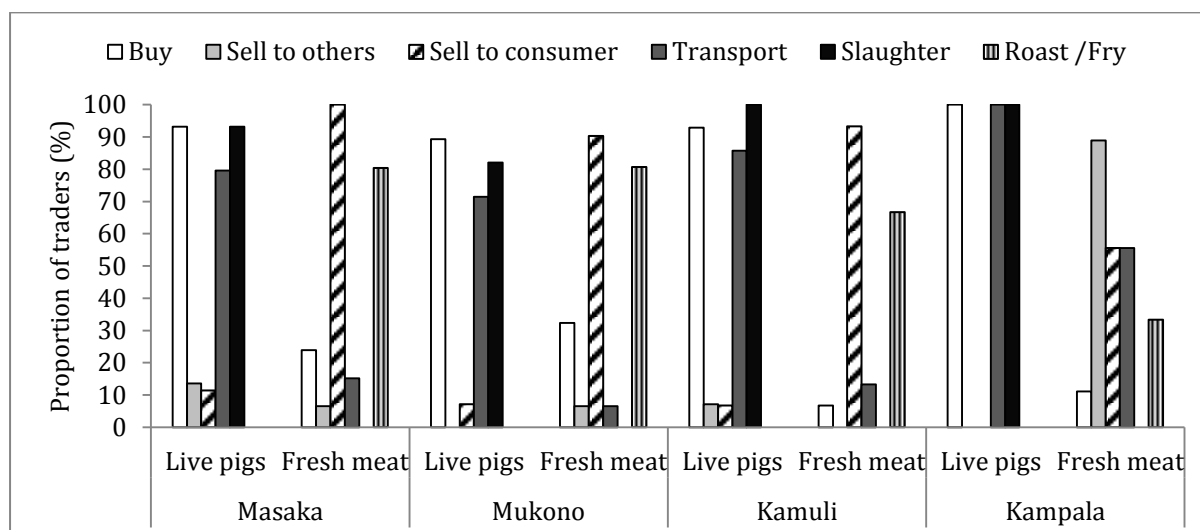
Source: Survey data

Most of the pig traders are vertically integrated, performing several market functions in the value chain.



### 1.1 Position and level of vertical integration of traders in pig value chain

Most of the traders purchased live pigs (89-100%) for resale across all the four districts (Figure 2) with only a few doubling as producers. In Masaka, the traders purchased from producers (93%), slaughtered (93%) and also provided transport services (79%) while fresh meat were predominantly sold to consumers (100%) and to other traders who roast or fry the meat (80%) in the restaurants or by the road sides, a common practise in the streets of many towns in Uganda. In Mukono, the traders were mainly transporters (71%) and slaughtered (82%) live pigs for sale. The similar trend was observed in Kamuli and Kampala but in the latter the fresh meat was sold to other traders, consumers and processors.



**Figure 2:** position of pig traders in the pig value chain by districts

The smallholder producers and traders as the major actors engaged in other business activities presented in Table 1. These activities show that some of traders were vertically integrated. For instance, 95% of the live pig traders operated butchery while 62% had pork joint. Pig producers were not vertically integrated since about 1% operated butchery and less than 1% had pork joint or involved in live pig trading, slaughtering and supply inputs to other pig producers. More producers than live pig traders engaged in crop business and sale of other food products.

**Table 1:** Engagement in other business activities along the value chain

Business Activities	Percent of producers (N=376)	Percent of live pig traders (N=101)
Butchery	1.1	95.1
Pork joint	0.8	62.4
Live pig trading	0.5	-
Processing (Slaughtering)	0.5	17.8
Supply inputs (e.g feeds)	0.8	0.0
Crop business	7.5	5.9
Sale of non-food goods	7.0	2.0
Sale of other food products	-	8
Pig production	-	22.7

The live pig traders were categorised as high, medium and lowly integrated based on the number of business activities they participated on along the value chain. The traders having between zero to one business activity were considered lowly integrated; two to three medium

integrated and those engaged in more than three activities highly integrated. Survey results indicate that 32.7% of the traders were highly integrated, 34.6% medium while 32.7% lowly integrated. Producers have not been considered in the analysis because less than 1 % engaged in pig value chain related activities. Type of business, market information access and assets significantly influenced level of vertical integration while non-membership to trade association had likelihood to reduce level of trader's integration (Table 2).

**Table 2:** Marginal effects of factors influencing level of live pig trader's integration

Factors	Unit of measurements	Level of integration		
		Low (N=33)	Medium (N=35)	High (N=33)
Gender	1= Male; 0 female	0.346	-0.164	-0.183
Age of the trader	Years	-0.004	0.002	0.002
Type of business	1 Sole; 0 Partnership	0.026	-0.318	0.292***
Trade association membership	1 Yes; 0 Otherwise	0.114	0.082	-0.196*
Market information	1 Yes; 0 Otherwise	-0.238***	-0.059	0.298***
Years in business	Years	0.007	-0.008	0.001
Value of assets	ln Ugandan shillings	0.021	0.031	0.522**

Note: \*\*\*, \*\*, \* significance levels at 1%, 5% and 10% respectively

Traders with higher asset value were more likely to be highly vertically integrated than the rest. For example those with more assets invested in other business ventures such as hotels and restaurants, and bar where most of the pig products were consumed and also engaged in providing transport services. Although unexpected, most of the sole proprietorship businesses were highly integrated probably because they were the majority of the businesses in the pig value chain. The traders accessing market information were likely to become vertically integrated since they get information about business opportunities than those with limited access. High integrated traders had a higher likelihood not to become members of trade association because they tend have more resources thus powerful in the value chain.

No contractual relationships existed between producers and other actors. However, about 5% of the traders had verbal contractual arrangements with the suppliers of pigs. This indicates that spot market governance structure is dominant in pig value chain compared to relational or hierarchical relationships. Relational and hierarchical structures are associated with higher asset specificity, greater uncertainty, more complexity and greater frequency of transactions which does not exist in Ugandan smallholder pig value chain. In these structures the trading relationships allows for trust to build and provide disincentives for opportunistic behaviour. Notably, spot market structure is preferred by smallholders because of low transaction costs while more intense and stable governance structure such as hierarchical are only adopted to reduce the transaction costs and reduce opportunism from exchange partners (Williamson 1991).

Perishability and related quality characteristics cause uncertainty in the transactions and such products should be transacted as quickly as possible (Costales and Catelo 2008). Therefore, spot market transactions continue to be dominant because pork meat is perishable given that the traders do not have cold storage facilities. When the spot market fails to recognize product differences, and fails to award proper premium price to high quality products, then the exchange partners may look for other governance mechanisms that can more efficiently solve the problems posed by uncertainty. More complex governance structure arises only where the transactions are characterized by information asymmetry and asset specificity such

that transferability of the assets becomes impossible when the transaction between the exchange partners stops. However, for Uganda pig value chain, most of the assets used by the traders and producers are transferable and trust is built between the actors.

### **1.2 Rules and regulatory requirements for pig trading in Uganda**

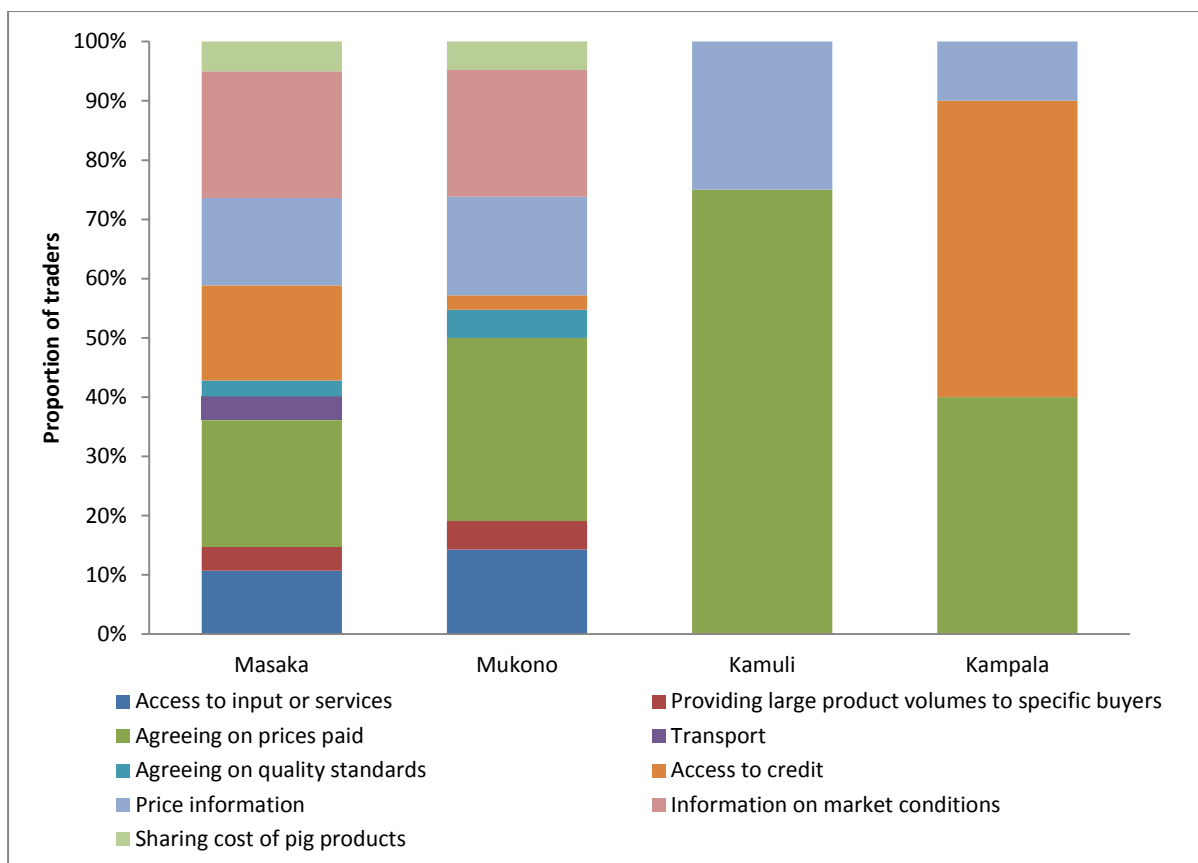
Governments play an important role of regulating livestock value chain to reduce power of natural monopolies, prevent negative externalities and reduce information asymmetries. Rules and regulations governing the smallholder value chain exist as claimed by 94% of the traders (Table 3). The business licence as regulation mechanism was enforced by the government through the county/districts officers. Few traders paid monthly statutory fees such as inspection fee (13%), abattoir fees (4%), slaughter fees (1%) and trade tax (2%).

**Table 3:** Statutory fees paid by the pig products traders

Type of fee	Percentage of traders paying	Payment frequency (Percent)				n
		One-off payment	Per year	Per month	Per transaction	
Business license	42.3	0.0	92.4	7.6	0.0	79
Health certificate	20.3	13.9	75.0	11.1	0.0	36
Slaughtering permit	8.0	0.0	6.7	62.0	33.3	15
Animal movement permit	7.0	7.7	7.7	53.9	30.8	13
Inspection fee	12.8	0.0	4.8	57.1	38.1	21
Abattoir fees	4.3	0.0	0.0	100.0	0.0	8
Slaughter fee	1.1	0.0	0.0	100.0	0.0	1
Trade tax	2.1	0.0	0.0	100.0	0.0	3

### **1.3 Horizontal collaboration/linkages and power relations**

According to TVA, the exchange partners often get transaction value for participating in transaction represented by collaboration advantages (Ji et al. 2012). Collaboration advantages are represented in Figure 3. Power as one of the collaboration advantages and the traders emerged as the most powerful actors in smallholder pig value chain in Uganda because they directly purchase from producers and sell to slaughter houses or slaughter themselves for sale. There was limited participation of the processors in the value chain. The traders in Masaka collaborated on accessing the inputs (17%) while 22% colluded on the selling prices to charge and buying price from producers. Besides, 35% of them get information on prices and other market conditions such as location of pig suppliers. However, they indicated that they never collaborate in transporting pig products (50%) and never provide large product volumes to specific buyers. On the other hand, traders in Mukono claimed that they collaborate on the prices to charge to customers (31%) and provide to each other the price information of pig products and other market conditions (38%). In Kamuli, 75% of the traders agreed that they often collude on prices to charge while 25% collaborate in providing price information to each other. In Kampala, the traders colluded on prices and share price information (60%) and access to credit (50%). Some of the traders shared costs to purchase pigs (4-50%) but only 50% of those in Kamuli shared cost of pig products.



**Figure 3:** Horizontal collaboration advantages to pig traders in Uganda

#### 1.4 *Pork quality standards*

In order to penetrate export market, the value chain actors including traders must ensure that the quality of the pork meet international standards. Slightly over half (55%) of the traders were aware of quality standards for pork meat. The export of live pigs in the region is still low compared to other live animals that are exported to Kenya, Tanzania, Rwanda, Southern Sudan and the Democratic Republic of Congo (DRC) because lack of quality standards for pigs in Uganda. Hygiene of pork abattoirs and pork joints in the districts including Kampala are still poor (Tatwangire 2013) which makes the poor quality pork to find its way into the market, while several illegal slaughter places continue to operate without supervision. The veterinary and public health departments in local governments are responsible for enforcing standards that ensure that only quality and safe pork and other meat products are offered in the market. The major characteristics of pork comprised lean, medium fatty meat, very fatty and tenderness. There was no clear distinction between the grades for live pigs and for pork meat from the information provided by the traders indicating inadequate information on the best grading criteria for pork products in Ugandan market.

#### 1.5 *Constraints in smallholder pig value chain in Uganda*

The producers, pig products (live pig and pork), livestock feed traders and veterinary drug sellers face various constraints that are discussed in Section 4.5.1 to 4.5.3.

##### 4.5.1 *Constraints affecting smallholder pig producers*

The constraints facing producers are classified into three categories marketing, input and production related constraints. The low prices of pig products are the predominant marketing

constraints faced by smallholder pig farmers (85%) followed by the lack of reliable market and market information. Other constraints mentioned hindering efficient marketing long distance to the market, non-payment of the debts by some buyers and difficulty in estimating the weight of the pig. Disease reduced production potential of pigs through deaths and was mentioned by 54% of farmers across all the districts. Other constraints mentioned by producers include poor housing (35%), scarcity of forage (32%) and lack of adequate capital (22%) to invest into pig production activities (Table 4).

**Table 4:** Constraints experienced by smallholder pig producers in Uganda\*

<b>Constraints</b>	<b>Frequency</b>	<b>Percent</b>
<i>Market related constraints</i>		
Low prices	279	85.3
Difficulty in pig weight estimation	14	4.3
Lack of reliable market	113	34.6
Non-payment of debts by buyers	12	3.7
<i>Production related constraints</i>		
Pig diseases	173	54.7
Poor housing	111	35.1
Scarcity of forage	100	31.6
Poor breeds	15	4.7
Lack of capital	68	21.5
<i>Input related constraints</i>		
Lack of extension service	36	15.4
Lack of cash to purchase inputs	51	21.8
Scarcity and high cost of feeds and drugs	121	70.5
Poor quality inputs (feeds)	13	5.6

\*Calculations based on multiple responses

In terms of input access constraints, pig farmers complained of poor quality feeds supplied by small-scale producers and traders that tend to use poor quality proportions of various ingredients. This is worsened by the fact that most farmers are not aware of suitable feed ingredients and the proper formulation of good quality compounded feeds. This has increased the price of available feeds especially maize bran because of the seasonal availability of maize which makes bran to be scarce and expensive during dry seasons. The quality of animal health products as well as animal health service providers were also indicated as limiting factors. Farmers indicated that most of the drugs used for treatment were expensive and also not effective they failed to completely cure the pigs from diseases and mortality rates continued to rise. In regards to input market access, longer distance to the input source was the most reported constraint. Input price fluctuation affected the operations of the farmers since prices for inputs are sometimes too high that they could not afford. Other important constraints reported by farmers were scarcity of feeds especially concentrates and lack of extension service.

#### 4.5.2 Constraints affecting pig and feed traders

The most common constraints that continue to affect pig traders include bad debts as some customers take products on credit and who never pays (12%), high prices for live pigs (13%), lack of capital (28%), limited customers in some seasons (13%), high transport costs (14%), difficulty in weight estimations (10%). Other constraints comprise purchasing meat from

dead pigs or stolen pigs, high taxes such as business license, inspection fees etc and challenges in meeting customer's preference.

**Table 5:** Constraints faced by pig traders in Uganda

Constraints	Pig products traders		Livestock feed traders	
	Frequency	Percent	Frequency	Percent
Bad debts	29	11.9	17	20.7
High prices of pigs/feeds	31	12.8	18	22.0
Limited capital	68	28.0	23	28.0
High transport cost	35	14.4	13	15.9
Seasonal customers	31	12.8	17	20.7
Competition between traders	23	9.5	4	7.3
Poor storage	8	3.3	2	2.4
Price fluctuation	8	3.3	17	20.7
High taxes	11	4.5	3	3.7
Difficulty in weight estimations	19	7.8		
Buying meat from dead /stolen pigs	19	11.1		
Death before sale	4	1.6		
Inability to meet customer preference	16	6.6		
Limited market	22	9.1		
Poor quality feeds			13	15.9
No clear feed formula			6	7.3
Others(theft & delayed supplies)			8	9.8

The most predominant constraint in livestock feed sector are presence of “fake feeds” in the market. The low quality of commercial feeds is associated inadequate knowledge on feed formulation by feed traders (Ouma et al. 2014). This in most cases is caused by adulteration and use of low quality raw materials to make feeds. Due to low quality commercial feeds in the market farmers have often reverted into using home-made ration for feeding their pigs. This is particularly confirmed by the fact that farmers in Mukono, Kamuli, and Masaka expressed interest in receiving training on how to formulate home-mixed feeds (Ouma et al. 2014). Due to price fluctuations for various types of feeds the traders find it difficult to stock them since the farmers/customers may not be able to purchase them. High transport costs affect the final prices that are offered in the market thus traders who incur more tend to charge high prices which affect the affordability of the feeds by small scale pig producers.

#### 4.5.3 Constraints affecting the drug stockists

Major challenges experienced by drug sellers were mainly high cost of drugs, price fluctuations, lack of knowledge on drugs and price competition from other traders. The lack of knowledge on certain drugs by the sellers may lead to prescription of wrong drugs to customer thus periodic training to drug stockists about new drugs in the market could be beneficial. Since affordability is a critical constraint limiting pig farmers demand, some stockists allowed them take drugs on credit based on informally agreed terms but sometimes farmers never pay. High supply prices and transaction costs, resulting from long distances to stockists and poor infrastructure (Chianu et al. 2008), cause many poor farmers to shy away from purchasing important inputs including drugs or they end up buying small quantities that results into under dosage to pigs.

## **2. Conclusions and implications**

This study describes the governance structure and the constraints in smallholder pig value chain in Uganda. The pig industry has for a long time, been ignored in almost all development interventions compared to dairy and poultry. Nevertheless, it is increasingly gaining popularity as an enterprise with great potential, given the increase in production and consumption of pork but still there are numerous constraints hindering the piggery performance. The most important value chain players identified include pig producers, village boar keepers, live pigs traders, feeds traders, veterinary service providers, public health personnel, and operators of slaughter houses, live pig/pork meat transporters. The NGOs involved in the sub sector include but not limited to World Vision, Volunteer Efforts for Development Concerns (VEDCO). The spot market and informal relationships are dominant in Ugandas' pig industry with limited relational or contractual which only existed between the processors and supermarkets. Based on Transaction Value Analysis (TVA) perspective, the traders were involved in horizontal collaborations which can be ways to improve the competitive position of traders in the value chain. It emerged that the traders were the most powerful players in smallholder pig value chain since they collaborated on a number of issues including price collusion. Pork quality assurance and standards in Ugandan pig value chain is still underdeveloped.

Low market prices for pig products are the predominant constraints affecting producers followed by the lack of reliable market. Non-payment of debts and inaccurate estimation of pig weight at the point of sale led to exploitation of farmers by the middlemen. Besides, poor quality feeds and veterinary drugs which sometimes do not completely cure diseases. Input price fluctuation affects the operations of the farmers since prices for inputs are sometimes too exorbitant.

The major constraints affecting live pig traders include bad debts arising from failure by customers to pay, high market prices for live pigs that reduces the profit margin, lack of adequate capital to reinvest into the trading. Presence of poor quality feeds in the market is associated with inadequate knowledge on feed formulation by feed traders caused by adulteration and use of low quality raw materials. The traders are not able to stock certain type of drugs because farmers do not purchase them. Lack of knowledge about new drugs in the market and low education level of Community Animal Health Workers (CAHWs) are also major challenges.

### **Implications**

Based on the findings of this study, the following implications are highlighted for action by the stakeholders in pig industry in Uganda.

- Promoting pig production among the Ugandan households will help to develop the sub-sector leading to more stable and reliable governance structures. The stable and reliable governance structures will contribute to reduction of transaction costs because it evident that there is no trust among the exchange partners as shown by numerous cases of bad debts. Contractual or hierarchical relationships create ready markets for pig and pork products thus reducing challenges posed by uncertainty and impacts positively to reduce poverty and food insecurity among the households.
- The government should enhance animal health service provision by training Community Animal Health Workers (CAHWs) to supplement the work of

government veterinary officers in reaching out to pig farmers. Periodic training of drug stockists about new drugs in the market could be beneficial.

- Having proper breeding programs in the sub-counties to avoid high level of inbreeding that has led to small litter size, poor growth rates, and small animal size. Proper breeding programs may also help smallholders to conserve their local breeds.
- It is necessary to educate all the value chain actors about public health and improved pig husbandry practices through training programs by livestock department, private veterinary service providers and NGOs. Besides, boosting the quality of pork products in order to meet the growing demand of premium pig meat products in the country and even to serve export market. Increasing production levels will allow exploitation of potential regional markets such as Southern Sudan, DRC and Rwanda.

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