Assessing the Dimensions of Transaction Cost in the Poultry Industry: The Case of the Ashanti Region of Ghana

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This paper analyzes the dimensions of transaction cost in the poultry industry. We analyze asset specificity, frequency, uncertainty, and opportunism in the poultry industry in the Ashanti Region of Ghana. We examine these dimensions for all firms in the production chain: input suppliers, producers, wholesalers, and retailers. The empirical analyses for this industry consisting of 128 firms (18 input suppliers, 50 farmers, 20 wholesalers, and 40 retailers) reveal that retailers' assets are specific and cannot be redeployed for other purposes; retailers experience some opportunistic (self-seeking) behavior from trading partners (i.e., producers, wholesalers, or both), and wholesalers also experience opportunism from their trading partners (i.e., producers, retailers, or both). The assets of input suppliers and producers are not specific and can be redeployed for other purposes. Transaction was frequent and certain for all the firms in the industry. Based on these results we recommend that retailers should have market-contract relationships with both wholesalers and farmers to safeguard themselves against the hazards of opportunistic behavior, as their assets are specific. Furthermore, wholesalers should also have some market-contract relationship with farmers to protect them from farmers' opportunistic behavior.

Agriculture remains the largest contributor to Ghana's GDP with a 39.3-percent share in 2006; the remaining 32.9 percent and 27.8 percent are for the services and industrial sectors, respectively (ISSER 2007). The agricultural sector in Ghana consists of the crop, livestock, fishery and forestry sub-sectors. The livestock and fisheries sub-sectors produce animal products to satisfy the protein needs of the people. Traditionally, cattle, sheep, goat, pig, and poultry industries are under the livestock sub-sector but it extends to the raising of other non-traditional domesticated animals such as grass cutter and guinea pig. Projections by the Ministry of Food and Agriculture (MoFA) suggest that in 2006 cattle production increased by about 0.7 percent to 1.38 million, sheep production increased 4.5 percent to 2.31 million, and goat production increased 5.1 percent to 4.12. Pig production figures suggest a decrease of 3.4 percent to about 280,000 in 2006. However, poultry production rose by 20 percent in 2006 after a consistent reduction in the number of birds in 2004 and 2005 (MoFA 2006). It is important to note that the basis for the projections is not quite clear and provides very little information for policy on the livestock and poultry sub-sector (ISSER 2007).

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Since the implementation of the structural adjustment program (SAP) in the early 1980s, local production of meat has not been able to meet the demand of the growing population. This has resulted in the importation of meat products to supplement local production. In 2002, for instance, the country imported 31,837.7 tons of meat and meat products. About 65 percent of the total imports were poultry products including whole chicken, thiGH¢, wings, and feet (MoFA 2003). Darko (1994) reported a high preference for imported frozen poultry products at the expense of those produced locally. This is due to the high cost of the locally produced birds (i.e., high cost of feeding and labor cost) compared to those imported. In December 2007, a 2-kilogram fully dressed chicken produced locally sold for an average GH¢8.00 farm-gate price while the imported equivalent sold between GH¢4.00 and GH¢5.00.

In an attempt to increase agricultural production, the government of Ghana in collaboration with the World Bank initiated the Medium Term Agricultural Program (MTADP) in 1992, with the National Livestock Service Project (NLSP) as a component. The aim of the NLSP is to increase meat, egg, and milk production in Ghana by 50 percent by the year 2020 (Adams 1999). Despite efforts by the government to improve the performance of the agricultural sector, farmers are faced with many problems that hinder productivity: input cost, lack of credit, disease conditions, and competition

from imported poultry products (Adams 1999). The poultry industry in Ghana continues to face intense price competition from poultry products imported from other countries. The poultry industry has been undergoing several changes, including vertical integration; sophistication, such as automation in feeding and watering; and the introduction of effective health programs to reduce morbid mortality in bird population.

There are two distinct poultry production systems in Ghana: traditional poultry production (traditional family poultry production) and commercial poultry production. The difference in these two lies basically in the scale of production, management, housing, and marketing of outputs. The largest source of growth in the poultry industry to help meet domestic demand in Ghana is the commercial poultry production system. Commercial poultry production started in Ghana in the early 1950s (Larbi 2001). The industry picked up in the early 1970s and since then has been producing on a commercial basis alongside family poultry production using an intensive management system involving deep litter and battery cages. Some of the enterprises are vertically integrated companies with their own parent-stock farms (very few hatcheries), broiler and layer farms, and processing and packaging units. Marketing of the product is either at farm-gate or retail outlets (Darko 1994). The commercial poultry industry has to be properly organized to make the required investment in capital and managerial skills necessary to compete with the various forms of poultry imports. Basic issues that need to be addressed in the local industry are operational processes and production inefficiencies, adoption of modern and appropriate channels of distribution, reduction in mortality rates, inefficient marketing strategies, and market research to mention only a few. This requires taking a critical look at managerial inputs in the production process and how they influence transaction in the commercial poultry industry. An analysis of the dimensions of transaction cost proposed by Williamson (1985), would provide insight into transactions in the commercial poultry industry in Ghana.

This study analyzes the dimensions of transaction cost between input suppliers and farmers, between farmers and wholesalers, between wholesalers and retailers, and for retailers.

The Food and Agriculture Organization of the United Nations (UN) acknowledge that poultry production is the most efficient and cost-effective way to increase the availability of protein. With the clearly defined role of agriculture in the Ghanaian economy, the commercial poultry industry as a sub-sector has an onerous task of providing enough animal protein to meet the country's demand and to achieve the policy of food self-sufficiency by the year 2020 (Larbi 2001).

The growth and Poverty Reduction Strategy (GPRS II), Ghana's strategic plan for accelerated growth to achieve wealth creation, poverty reduction and equitable development, places major emphasis on agriculture. However, in order for the sector to deliver its expected strategic contribution, the need for structured transformation and encouragement of local production cannot be overemphasized. Poultry production is big business throughout the world today. The economy of Ghana depends mainly on agriculture, and to ensure growth the poultry sector must play significant role in this respect. Therefore development of the poultry industry could help the economy through a reduction of poultry-product imports and, possibly, to earn foreign exchange through the export of poultry as a non-traditional export commodity (Adams 1999).

Studies have been conducted on the poultry industry in Ghana since 1960. However, the majority of these studies are on health and nutrition, production, and management of poultry. It is clear that very little work has been carried out in the area of assessing the dimensions of transaction cost and factors that affect transaction cost. This study reveals who among the channel members in the industry has an advantage over their trading partners. It also may help channel members develop satisfactory safeguards in their transactions (i.e., to organize transactions so as to safeguard against the hazards of opportunism). Furthermore, implementation of the recommendations of this study may help reduce conflict and enhance channel members' satisfaction in the poultry industry in Ghana.

The study is organized into four sections. Section 2 provides the conceptual framework of the study, Section 3 provides the empirical application, and Section 4 provides the conclusions, recommendations, and suggestions for further research.

Conceptual Framework

Agricultural transactions provide a rich and largely unexplored area for application and refinement of transaction-cost theory (Matsen 2000). Empirical investigation of farmland sharecropping contracts discloses that predictions of agency theory are not borne out by the data; their failure to correct for endogenous matching may explain the result (Ackerberg and Botticini 1999). The perishable nature of agricultural goods poses contractual hazards for which comparative contractual reasoning is needed (Masten 2000). Williamson (1975) stated that backward integration of processors into farming would have a detrimental effect on the incentives of farmers and would pose added control costs. He further stated that the three dimensions or variables that are used to characterize any transaction are frequency, uncertainty, and asset specificity. This review reveals that transactions in the poultry industry can be frequent or rare; have high or low uncertainty; or may involve specific or non-specific assets. Following Williamson (1975, 1985), this research seeks to examine the dimensions of transaction cost in the poultry industry in Ghana in the context of marketing channels between input suppliers and farmers, between farmers and wholesalers, and between wholesalers and retailers. This conceptual framework identifies or provides insight into the nature of the trade relationships that exits among channel members in the poultry industry. The conceptual framework is shown in Figure 1.

Empirical Application: Data, Methodology, and Results

This study primarily assesses the dimensions of transaction cost in the poultry industry in the Ashanti Region of Ghana. The data were based on information obtained from questionnaire and interviews. The questions in the questionnaire were based on the dimensions of transaction cost: asset specificity, uncertainty, frequency, and opportunism. The data were obtained using a Likert-scale type of questionnaire given to 128 marketing-channel members. Fifty farmers randomly selected out of the seventy-two farmers belonging to the Ashanti regional poultry farmers association. Eighteen input suppliers were purposely selected from four districts: Kumasi Metropolis, Atwima Nwabiagya, Ejisu Juaben, and Sekyere East. Twenty wholesalers were selected based on consultation with the poultry farmers. Forty retailers were randomly selected from five major markets in the Ashanti region: Asafo market, Kumasi Central market, Nkawie market, Kwadaso market, and Efiduase market.

The data obtained from the input suppliers were used to analyze the dimensions of transaction cost between input suppliers and farmers. The data obtained from the farmers were used to analyze the dimensions of transaction cost between farmers and wholesalers. The data obtained from wholesalers were used to analyze the dimensions of transaction cost between wholesalers and retailers. The data obtained from retailers were used to analyze the
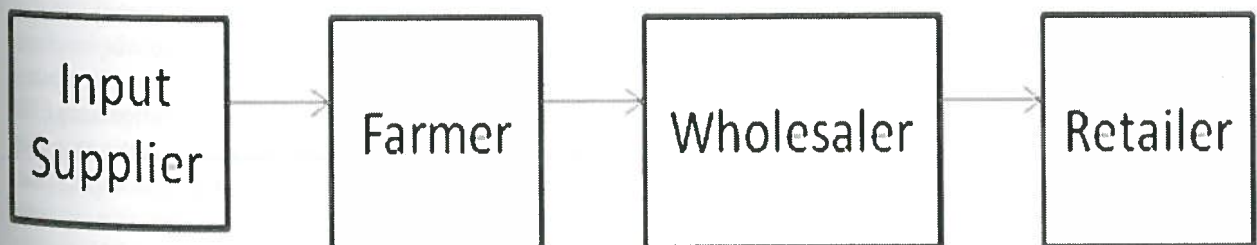

Figure 1. Conceptual Framework.

dimensions of transaction cost of retailers.

The indicators used for collecting data were "strongly disagree = 1," "disagree = 2," "indifferent = 3," "agree = 4," and "strongly disagree = 5." The data were analyzed using the statistical package for social sciences (SPSS). The chi-square goodness-of-fit test—one of the most commonly used non-parametric tests, developed by Karl Pearson in the early 1900s—was used to test for the significance of the variables (dimensions). The purpose of this goodness-of-fit is to determine how well an observed set of data fits an expected set of data (Lind and Mason 1997).

Analyzing Dimensions of Transaction Cost between Input Suppliers and Farmers

Asset Specificity: Out of 18 input suppliers 16 (88.9 percent) said assets are not specific, meaning that the assets can be redeployed for other purposes. One input supplier (5.6 percent) said otherwise, and the other supplier (5.6 percent) was indifferent. The chi-square statistic for asset specificity was 17.0 ($p < 0.01$), indicating that it is significant at one-percent level (i.e., assets are not specific for input suppliers).

Frequency of Transaction: Fifteen input suppliers (84.3 percent) said transaction is frequent, meaning farmers fulfill their transaction agreements; the remaining 15.7 percent said transaction is not frequent between them and the poultry farmers. The chi-square statistic for frequency of transaction was 8.0 ($p < 0.01$), indicating significance at the one-percent level (i.e., based on the null hypothesis, transaction is frequent between input suppliers and farmers).

Uncertainty of Transaction: Thirteen of the 18 input suppliers (73 percent) said transaction is certain and four suppliers (22 percent) said transaction is not certain; the remaining supplier (5.6 percent) was indifferent. The chi-square value for uncertainty was 4.765 ($p < 0.05$), indicating significance at the five-percent level (i.e., based on the null hypothesis, transaction is certain between input suppliers and farmers).

Opportunism: Ten input suppliers (55 percent) said there is no opportunism between them and the poultry farmers. That is, poultry farmers do not exhibit self-seeking behavior toward input suppliers. Eight suppliers (45 percent) said there

is opportunism. However, the chi-square statistic is not significant.

Analyzing Dimensions of Transaction Cost between Farmers and Wholesalers

Asset Specificity: Forty-five of the 50 poultry farmers (90 percent) said assets are not specific, implying their assets can be use for other purposes; four farmers (eight percent) said that their assets are specific to producing poultry alone, and one farmer (two percent) was indifferent as to whether assets can be redeployed or not. The chi-square statistic for asset specificity was 34.30 ($p < 0.01$), indicating that it is significant at the one-percent level (i.e., farmer assets are not specific).

Frequency of Transaction: All fifty farmers (100 percent) said transaction between them and the wholesalers is frequent—more than ten wholesalers buy from each poultry farmer every week. The chi-square statistic for frequency was 50.0 ($p < 0.01$), indicating significance at the one-percent level.

Uncertainty of Transaction: All fifty farmers (100 percent) said transaction between them and the wholesalers is certain, meaning wholesalers fulfill their transaction agreements. The chi-square statistic for uncertainty was 50.0 ($p < 0.01$), indicating significance at the one-percent level.

Opportunism: Twenty-nine farmers (58 percent) said there is no opportunism between them and wholesalers, meaning their trading partners do not exhibit self-seeking behavior. Twenty-one farmers (41 percent) said wholesalers exhibit self-seeking behavior. However, the chi-square statistic is not significant.

Analyzing Dimensions of Transaction Cost between Wholesalers and Retailers

Asset Specificity: Eleven of the 20 wholesalers (55 percent) said that their assets are not specific to the wholesaling of poultry products. Three wholesalers (15 percent) said that their assets cannot be redeployed for any other purpose. Six wholesalers (30 percent) were indifferent. The chi-square value for asset specificity was 4.571 ($p < 0.05$), indicating that it is significant at the five-percent level (i.e., assets are not specific to these wholesalers).

Frequency of Transaction: Thirteen wholesalers (65 percent) agreed that transaction with their trad-

ing partners was frequent, meaning that more than ten retailers buy from them every week. However, six wholesalers (30 percent) disagreed and one wholesaler (5 percent) was indifferent, implying they neither agree nor disagree that ten customers purchase from them every week. The chi-square statistic for frequency was 3.556 ($p < 0.05$), indicating significance at the five-percent level (i.e., transaction is frequent for the wholesalers).

Uncertainty of Transaction: Sixty-five percent of wholesalers agreed that transaction was certain, meaning their trading partners fulfill their transaction agreements; 25 percent said transaction was uncertain, implying that their trading partners do not fulfill their transaction agreements. Ten percent were indifferent as to whether their trading partners fulfill their transaction agreements or not. The chi-square value for uncertainty was 3.556 ($p < 0.05$), indicating significance at the five-percent level (i.e., transaction is certain for the wholesalers).

Opportunism: Fourteen out of 20 wholesalers (70 percent) agreed that there is self-seeking behavior among their trading partners. Twenty-five percent said there is no opportunism. Five percent were indifferent. However, the chi-square statistic is not significant (i.e., based on the null hypothesis, the trading partners of wholesalers exhibit self-seeking behavior).

Analyzing the Dimensions of Transaction Cost of Retailers

Asset Specificity: Thirty-seven out of 40 retailers (92.5 percent) said their assets are specific to the retailing of poultry products alone, and as such cannot be redeployed for any other purpose. One percent said that their assets are not specific, and the remaining five percent were indifferent as to whether their assets can be used for another purpose or not. The square chi-square statistic for asset specificity was 30.421 ($p < 0.01$), indicating that it is significant at the one-percent level (i.e., based on the hypothesis, assets are specific for the retailers).

Frequency of Transaction: Thirty-three out of the forty retailers (85 percent) agreed that transaction was frequent, meaning more than ten customers buy from each retailer every week. However, seven retailers (17.5 percent) said less than ten customer buy from them every week, implying transaction was not frequent. The chi-square for frequency

was 16.90 ($p < 0.01$), indicating significance at the one-percent level (i.e., transaction is not frequent for retailers).

Uncertainty of Transaction: Twenty-four retailers (60 percent) agreed that their trading partners fulfill their transaction agreements, while 35 percent said the opposite and the remaining five percent were indifferent. The chi-square value for uncertainty was 3.60 ($p < 0.05$), indicating significance at the five-percent level (i.e., transaction is certain for retailers).

Opportunism: Thirty-four retailers (85 percent) agreed that their trading partners exhibit self-seeking behavior; six retailers (15 percent) said there is no opportunism among their trading partners, meaning their trading partners do not exhibit self-seeking behavior. The chi-square statistic for opportunism was 19.60 ($p < 0.01$), indicating significance at the one-percent level (i.e., based on the null hypothesis, the trading partners of wholesalers exhibit self seeking behavior).

Conclusion

This study assesses the dimensions of transaction cost in the poultry industry in Ghana. It uses Williamson's (1975, 1985) approach to assess transaction cost among 128 marketing-channel members in the poultry industry in the Ashanti region of Ghana: 50 poultry farmers, 18 input suppliers, 20 wholesalers, and 40 retailers. The analysis was based on primary data collected through a questionnaire and interviews. Chi-square analysis was employed in the analysis of the data obtained.

The results reveal that assets are specific to a majority (92 percent) of retailers. Thus assets cannot be redeployed for other purposes. Eighty-five percent of the retailers reported that their trading partners—wholesalers, farmers, or both—exhibit self-seeking behavior. On the other hand, there was a high percentage of opportunism (70 percent) for wholesalers. Thus the farmers, the retailers, or both exhibit self-seeking behavior. However, for input suppliers, poultry farmers, and wholesalers, assets were not specific, implying that assets can be redeployed for other purposes. Lastly, transaction was frequent and certain among all channel members in the poultry industry.

Investments in specific assets will create a safeguarding problem due to the vulnerability of

potential opportunistic behavior from the other channel members (Jacobs 1974). Protection against opportunistic behavior is achieved by moving away from an arm's-length market relationship toward vertically integrated relationship and associated bureaucratic control mechanisms (John 1984). Unfortunately, this prediction is simply irrelevant among small channel members like retailers in the poultry industry because they cannot consider vertical integration as a feasible alternative. The fundamental concern of a study of the dimensions of transaction cost is to develop a satisfactory method of organizing transactions to safeguard against the hazards of opportunism (Klein, Crawford, and Alchian 1978). In this respect, the study recommends that retailers should enter into long-market contracts with both wholesalers and farmers to safeguard themselves against the hazards of opportunistic behavior, since their assets are specific. Furthermore, based on the empirical results, wholesalers should also enter into market contracts with the farmers to protect themselves from farmers' opportunistic behavior. Thus formal market agreements will ensure that the farmers produce for domestic wholesalers rather than selling their products to wholesalers from neighboring countries such as Cote D'Ivoir, Mali, and so on. This is advised because some wholesalers complained about some farmers not selling to them during periods of high demand such as the Christmas season. Formal written market agreements would also ensure that wholesalers buy from the farmers.

The limitations of the study are as follows. First, only 50 poultry farmers were selected for the study because locating the farmers in the various districts was a constraint. Second, the study captured a small number (18) of input suppliers because of inflexibility and unwillingness on the part of some input suppliers to give out information for the study. A further limitation involves the way in which the substantive variables of the study were operationalized. The measure of uncertainty and frequency in transaction is based on the predictability of sales; those operational measures have merits, but each construct encompasses other dimensions that should be investigated (Heide and John 1988). Further research employing alternative methods could address these limitations usefully. Finally, for this study the data were collected during the Christmas season when most households were buying chicken for the Christmas celebrations, which may influence the frequency and certainty of transactions among marketing channel members in the poultry industry. Hence further studies should collect data during a non-holiday season to validate the certainty and frequency in transaction among channel members.

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