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Relationship and quality management in the Chinese pork supply chain ☆

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ABSTRACT

This article attempts to integrate transactional and relational governance perspectives to investigate interfirm exchange relationships and quality management in the pork supply chain in China. Data from 229 pork processors from eastern China were used for analysis. Path analysis results reveal positive relationships between the degree of asset specificity and uncertainty and the degree of vertical coordination and between the degree of vertical coordination and quality management practices. However, insignificant positive relationships were found between asset specificity and relational governance in the upstream chain and between uncertainty and relational governance in the downstream chain. A discussion of the results and of the implications of the findings is provided.

1. Introduction

China has become the world largest pork production and consumption country since the early 1990s. The total output of pork production reached nearly 52 million tons in 2006, accounting for more than 50% of the total pork production in the world. However, China exported less than 1% of its pork output in 2006 (National Bureau of Statistics of China, 2007); which can be explained by the poor image of its pork quality as well as the outbreak of animal diseases in the country. In the last five years, the pork industry was influenced by the outbreak of *Streptococcus suis* in swine and humans in Sichuan province and the Porcine Reproductive and Respiratory Syndrome diseases in many areas of China. Media also reported safety problems caused by drug residuals and Clenbuterol food poison accidents. With the increasing income and changing lifestyles generated by rapid economic and social development, China's pork industry will probably be driven to emphasize safety, quality and convenience in the future. However, the current pork industry is characterized by the dominant position of smallholder hog producers and slaughterhouses. The organization of such a fragmented pork chain induces problems in tracking and tracing pork from "field to table" (Han et al., 2007). It is therefore critical to seek for better supply chain governance to solve the quality and safety problems in the pork industry.

Traditional spot market transactions are still the most popular market channel that farmers use for selling their hogs (Zhou and Dai, 2005). However, contractual governance and relational governance mechanisms are also popular in interfirm exchange. Large and medium size meat processing companies (e.g. Shineway and Yurun Co. Ltd.) have established closer vertical coordination mechanism with their suppliers and retailers, and invested heavily in developing cold chains to provide consumers with brand products. Retailers, especially the supermarkets, look for a closer relationship with suppliers to meet quality demand. Also, more franchised and specialized stores have been established by large pork processing firms. An important question in this research is whether more integrated governance forms improve pork quality management (QM). The empirical studies on the relationship between governance forms and QM in China are scarce. Insights on this relationship will thus provide instruments for further developments on the Chinese pork sector in general and the coordination of integrated QM in pork chains in particular.

Organizational arrangements and transaction attributes have been studied by the theory of transaction cost economics (TCE). Characteristics of transaction-specific investments (TSIs), frequency and uncertainty have been examined in light of their impact on governance mechanisms. The general proposition of TCE is that managers align the governance features of inter-organizational relationships to match known exchange hazards, particularly those associated with specialized asset investments, difficult performance measurement, or uncertainty (Williamson, 1985, 1991a). However, some researchers argue that in practice,

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given that TSIs are necessary, many transactions exist outside the realm of vertical integration or contracts (Bensaou and Anderson, 1999). They postulate that one possible reason for this is that relationships based on trust make vertical integration less important to protect TSIs. An ongoing relationship generally fosters trust and enables partners to adopt more flexible models of cooperation (such as alliances), create value together (that is, mutual benefits or reciprocity), and eventually, induce exchange partners to make TSIs (Yu et al., 2006). This is the major view of relational exchange theory (RET, MacNeil, 1978). Though in the last decade, studies have been done to investigate interfirm exchange relationships using both TCE and RET (e.g. Yu et al., 2006; Zhou et al., 2008), empirical evidence informing this issue in the Chinese context is scarce and mixed (Zhou et al., 2008). Furthermore, while the impact of transaction attributes on governance mechanisms has been devoted significant attention, there is a lack of a comprehensive framework to explain the alignment of governance mechanisms in the presence of transaction characteristics in the pork supply chain from both transactional and relational perspectives. Therefore, one of the purposes of this study is to develop a framework that integrates TCE and RET to explain the impact of transaction attributes on governance mechanisms in the context of the pork processing industry. In addition to this, the trade-off between formal contracts and relational governance mechanisms will also be examined.

The layout of the paper is as follows: the next section introduces the theoretical framework and the relationships among the research constructs. The research design is then described and the empirical results are presented in Sections 3 and 4, respectively. Section 5 draws conclusions and presents some discussion. Finally, the chapter concludes with implications for the managers of pork processing firms in China, limitations of the study and recommendations for future research.

2. Theoretical framework

2.1. Transaction attributes and governance structure

Transaction cost economics (TCE) is an analytical paradigm whose primary subject matter is the design of efficient governance mechanisms[1] for supporting exchange (Heide and John, 1992). The original framework, as developed by Williamson (1975), views the governance decision as fundamentally a choice between a "market", based on governance through a price mechanism, and a "hierarchy", implying governance through a unified authority structure. The main approach of TCE is to assign attribute differentiated transactions to governance structures in a transaction-cost-minimizing manner (Williamson, 1989). Transaction cost was interpreted broadly as the "*comparative costs of planning, adapting and monitoring task completion under alternative governance structure*". In studying governance structure, Williamson (1985) identifies three main transaction characteristics: transaction-specific investments, uncertainty and frequency. The *frequency* usually affects governance only in conjunction with the asset specificity involved in the transaction (Boger, 2001). As TCE researchers have been largely unsuccessful in confirming the hypothesized effects of frequency on the governance model, frequency has received limited attention in TCE literature (Rindfleisch and Heide, 1997). It is thus not the focus of our study.

[1] "Governance mechanism" or "governance form" has been used in TCE instead of "governance structure" (Hesterley et al., 1990, p. 430). They will be used interchangeably in our study.

2.1.1. Transaction-specific investments and governance structure

The "transaction-specific investments" (TSIs) dimension is the most frequently used to explain the optimal governance mechanism for transactions. Governance structures range from 'classical contracting' (spot markets) at one end of the spectrum, to unified governance (vertical integration) at the other (Williamson, 1979). In between are the hybrid modes, including contract and strategic alliances. Transaction cost analysis predicts that market governance will be cost-efficient as long as the level of asset specificity is modest. As TSIs pose a contractual hazard for any investor, the exchange partner can exploit such assets because they are not redeployable, or at least they have a reduced value in an alternative exchange relationship. Therefore, the hybrid mode will come into play when asset specificity does rise substantially. Under such circumstances, hybrid governance is warranted for the purpose of enhancing the utility of specific productive resources (Williamson, 1991b). Thus, when the degree of TSIs is low, we expect the pork processors to use spot market transaction in their exchanges with hog (meat) suppliers and downstream customers. With increasing levels of TSIs, the contractual and integrated governance mechanisms are expected to be employed in buyer–supplier relationships of the pork chain.

2.1.2. Uncertainty and governance structure

Uncertainty and complexity are central problems of transactions. Without uncertainty, transactions would be fully predicted ex-ante. Uncertainty comprises unforeseen, exogenous disturbances as well as behavioral uncertainty (Williamson, 1985). Pork processing depends on access to raw materials (hogs), labor and capital, management expertise, regulatory requirements, infrastructure, technological adoption and access to end-users (Boal, 2006). Some important factors inducing great uncertainty for pork production and marketing include the innate volatility of feed prices, fragmented hog production and slaughtering units, low production technology, weak disease resistance capabilities and information asymmetry between the buyers and suppliers. The hog price in China is subject to great fluctuation. For example, the average hog price was about \$1.27 per kilogram in 2006. While it decreased to \$0.94 at the end of 2006, it jumped to \$2.21at the end of 2007 (Feng, 2009). Hog price changes inevitably result in volatility of pork prices.

The transaction cost logic advances that, for simple exchanges in certain environment, markets efficiently coordinate adaptation, since "price" serves as a sufficient mechanism. However, contracts are more specific since they include clauses related to duration, expectations, processes and procedures aimed at preserving the cost, quality and service of the product (Williamson, 1996). Compared to spot market, contracts are better governance mechanisms for monitoring more efficiently and adjusting rapidly when uncertainty arises (Zhou et al., 2008). Therefore, we expect that the pork processing firms are more willing to use contractual governance mechanisms in managing buyer–supplier relationships with increasing levels of uncertainty in the pork supply chain.

2.1.3. Transaction attributes and relational governance

Although formal contracts are mechanisms that attempt to reduce risk and uncertainty in exchange relationships (Lusch and Brown, 1996), legal contracts cannot explicitly state how potential situations will be handled in the future (MacNeil, 1980). Buyers and sellers are usually incapable to write a priori comprehensive agreement that covers future contingencies. The buyer–supplier exchange performance can be enhanced by embedding private and public information flows in a matrix of