



# Certified standards and vertical coordination in aquaculture: The case of pangasius from Vietnam



Neda Trifković\*

Department of Economics, Faculty of Social Sciences, University of Copenhagen, Øster Farimagsgade 5, building 35, 1353 København K, Denmark

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## ABSTRACT

This paper explores the interaction between food standards and vertical coordination in the Vietnamese pangasius sector. For farmers and processors alike, the adoption of standards is motivated by a desire to improve market access by ensuring high quality supply. Instead of encouraging the application of standards and contract farming, processing companies prefer to vertically integrate primary production largely due to concerns over the stable supply of pangasius with satisfactory quality and safety attributes. These tendencies increase the market dominance of industrial farming and worsen the position of small household farms.

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## 1. Introduction

Global production and trade of food products are facing important structural changes reflected in complex consumer preferences, increased sourcing from developing countries, dominance of multinational companies and retail chains, and high demand for information about products and production processes (Reardon et al., 2009). Asymmetric information between buyers and suppliers can generate an oversupply of low-quality products (Akerlof, 1970) or the complete breakdown of transactions (Rothschild and Stiglitz, 1976). Consequently, the food sectors in both developed and developing countries are (i) introducing standards for assuring food safety and quality, as well as the environmentally and socially responsible production practices; and (ii) trending towards closer vertical coordination of value chains, which typically entails full vertical integration or contracting of primary production.

This paper focuses on the interplay of certified standards and vertical coordination as competing mechanisms for addressing asymmetric information problems. Standards are measures by which products, processes and producers are judged (Hatanaka et al., 2005). As such, they provide information about different product attributes<sup>1</sup> and the elements of the production process, which must be identified and preserved as the product moves along the value chain. The initiatives to require certified standards and product traceability are attributed to the increasing dominance of retailers in the food sector (Dolan and

Humphrey, 2000; Henson and Reardon, 2005). By requiring certified standards, the retailers are able to shift the costs of monitoring food safety and quality to their suppliers (Hatanaka et al., 2005). While standards can bring competitive advantage and secure market access, assuring compliance may be costly, raising the bar for smallholders to enter the export value chains. Indeed, a large number of studies investigate the exclusion of smallholders from value chains due to standards (for an overview, see Reardon et al., 2009) or the marginalisation of developing countries in supplying global markets (Ponte, 2012).

Vertical coordination refers to various methods used by trading partners to manage economic relationships during production, distribution and marketing. There are several types of vertical coordination, ranging from spot markets to hierarchies (usually called full vertical integration), with a plethora of manifestations in between, such as contracts, strategic alliances, partnerships, joint ventures and non-profit organisations. The focus of this paper are a) full vertical integration, which assumes full ownership of the vertically adjacent stages in the value chain and b) contracts between farmers and firms that process the farmer's crop.<sup>2</sup> Engaging farmers in export sectors through contract farming – where processing companies provide production resources and guidance to farmers in return for adherence to strict production methods, delivery quantities and product quality – has been an increasingly important practice in developing countries (Grosch, 1994; Key and Runsten, 1999; Minten et al., 2009; Singh, 2002). Contract farming is, however, susceptible to problems as both farmers and processors can

\* Tel.: +45 3533 3642.

E-mail address: [neda.trifkovic@econ.ku.dk](mailto:neda.trifkovic@econ.ku.dk).

<sup>1</sup> Agri-food products carry at the same time: search, experience and credence attributes. For additional information, see Nelson (1970), Darby and Karni (1973) and Tirole (1988).

<sup>2</sup> The definition of contract farming draws heavily on Grosch (1994).

default on contract obligations (Glover, 1987). Thus, even with contracts and standards, some processors or marketers may decide to fully integrate primary production if the transaction costs and production risks of outsourcing are assessed as too high.

The choices about vertical coordination and standards influence the relations and the organisation of the value chain. So far, it has not been common to ask producers directly about their motivation to pursue different vertical coordination forms and to apply standards. Motives are usually inferred from the observed effects in the context of prevailing production and market conditions (Masakure and Henson, 2005). Indeed, previous literature on the motivations for vertical coordination and food standards has tended to adopt an ex post perspective on the interaction of motivations and the implications for producers from developing countries (for example, Asfaw et al., 2010; Barrett et al., 2012; Bellemare, 2012; Bolwig et al., 2009; Kersting and Wollni, 2012; Rao and Qaim, 2011).<sup>3</sup> This paper departs from previous studies by attempting to identify the range of motives to pursue vertical coordination and to apply standards for both farmers and processors that constitute the key actors at the pre-export segment of the Vietnamese pangasius value chain.

The parallel existence of standards and vertical coordination raises additional questions that are crucial for understanding the producers' role in export value chains. What motivates farmers and processors to implement standards? Can farmers use standards to their advantage in an environment with increasing vertical coordination? Why do standards and vertical integration co-exist in a single value chain? How are the relations between the value chain actors modified by the introduction of standards as compared to vertical coordination? Exploring the rationale for pursuing vertical coordination and/or standards may be critical for improving socio-economic outcomes of producers from developing countries engaged in the production of high-value export commodities.

Several studies have illustrated how a high demand for international standards leads to increased vertical integration in agri-food value chains (Gibbon, 2003; Maertens and Swinnen, 2009; Maertens et al., 2012; Schuster and Maertens, 2013). However, it is argued in this paper that although standards improve market access, they are not the most decisive factor in determining the organisation of the value chain. This is what holds for the Vietnamese pangasius sector, where the need to assure stable supply coupled with the weak contract-enforcing environment is the main driver of vertical integration.

The Vietnamese pangasius (*Pangasianodon hypophthalmus*) sector is an excellent case for studying the implications of vertical coordination and standards in a global value chain (GVC). The sector has established a global presence in the past decade, supplying more than 100 countries worldwide. The total production surpasses one million tons per year and the export turnover was USD 1.85 billion in 2011 (Dzung, 2012). A growing number of vertically integrated farms have been reported (Bosma et al., 2011). The sector has, as the intensive aquaculture sectors elsewhere, attracted considerable international attention in terms of safety, environmental and social aspects of production practices. The negative media attention in the EU (Bush and Duijf, 2011) and the NGO pressure for improved accountability (WWF, 2010) have led to a burgeoning number of different standards in the sector. The introduction of standards and the increase of vertical integration in the sector have, however, attracted only a modest research interest. Bush et al. (2009) focused on examining the potential of various standards to assure sustainable production and Belton et al. (2011a,b) investigated whether standards can improve local environmental conditions. This paper supplements the earlier research by drawing attention to the interplay between vertical coordination initiatives and safety and quality

aspects of pangasius production, which are considered equally relevant (Bush and Duijf, 2011; Little et al., 2012).

This paper shows that processing companies rely on vertical integration with direct involvement in farming, rather than standards or contracts with limited involvement in farming, to address the information asymmetry problems. Three findings from the pangasius sector corroborate this argument. First, while farmers and processors may perceive standards as a way of upgrading and securing market access, the application of standards is still weak, so standards are not, at the time being, the best option for addressing the quality supply concerns in the pangasius value chain. Second, contract farming is not a preferred choice in the pangasius sector: due to the weak legal environment, it is easy to avoid responsibilities specified in the contract. Third, the concerns over the stable supply of pangasius with satisfactory quality and safety attributes considerably induce processing companies to conduct primary production internally. While previous studies have mainly focused on the issues of exclusion and welfare outcomes of standards in GVCs, this study draws attention to the supply concerns, which are as important as quality and safety of food products. Instead of encouraging the application of standards and contract farming, processing companies organise production internally, thus increasing the market dominance of industrial farming and aggravating the position of small household establishments.

The paper is organised as follows: Section 2 offers a brief discussion on standards and vertical coordination in the context of GVCs. Section 3 describes the methods used for data collection, whereas Section 4 informs on the structure of the Vietnamese pangasius value chain. The analysis of the factors that motivate the adoption of standards and vertical coordination is in Section 5. The main findings and their policy implications are summarised and discussed in Section 6.

## 2. Vertical coordination and standards in global value chains

As quality and safety of food products in the final markets depend on the activities performed at several stages of the value chain, assuring compliance with customer and regulatory requirements and avoiding potentially negative demand effects are achieved through some form of vertical coordination. The incentives for closer vertical coordination arise as a response to market imperfections (Hennessy, 1996; Williamson, 1975), whereby higher transaction costs, i.e. higher information, search and monitoring costs related to purchasing in spot markets induce firms to internalise or contract production. Moving away from spot-market transactions towards more closely coordinated relations improves the ability of processing companies to address the information asymmetry problem and secure enough supply of raw materials while minimising production and transaction costs. In other words, if the characteristics the buyer is concerned about are not easily acquired through market exchange, vertical coordination – contracts or vertical integration – will emerge. The evidence shows that while vertical integration may improve supply chain coordination in comparison with outsourcing, it may also involve greater bureaucratic costs (D'Aveni and Ravenscraft, 1994). Another explanation of the incentives for vertical coordination is found in the risk-sharing approach, where coordination is seen as a means to reduce business risks. Where the risk of supplier failure is perceived to be high, it is more likely that the chain is coordinated through more explicit forms of coordination (Humphrey and Schmitz, 2002).

Alternatively, coordination between upstream and downstream firms can be achieved by standards, as they enable transferring the information about process parameters and production activities between trade partners. Standards arise from the need to increase coordination of the activities between different agents due to the need to exchange high amount of complex and non-market information. The emergence of standards is important not only for the safety of products in consumer markets, but also for the organisation of value chains (Reardon et al., 1999). Ponte and Gibbon (2005) argue that quality grades and standards

<sup>3</sup> Although, see Masakure and Henson (2005) for the analysis of contract farming in Zimbabwe and Swinnen (2005) for the analysis of vertical coordination in Eastern Europe and Central Asia.

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