

**Contract Farming in Vietnam: Empirical Research
on Marketing Determinants, Farm Performance and Technical
Efficiency of the Export-oriented Rice Sector
in the Mekong River Delta**

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Summary

Better market linkages and higher farm benefits for smallholder farmers in emerging and developing economies have received remarkable attention worldwide (Minot and Roy, 2007; Kumar et al., 2011). In this regard, contract farming (CF) is proposed as a better solution to the fact that smallholders are otherwise potentially dropped out of the modern marketing channels because of small-scale production and farmers from emerging and developing countries are to earn more farm benefit by getting closely linked to modern, in many cases global food value chains markets (Bacon, 2005; Mangala and Chengappa, 2008; Minten et al., 2009; Rao et al., 2012; Jia and Bijman, 2013). Furthermore it is expected that the challenges of a sharply increasing world population, the overuse of natural resources, and the reduction of overall agricultural land size can be met by contracting smallholder farmers (Sartorius, 2013). However, the circumstances of farmers' decision in contracting and its influences on farm performances have remained uncertain so far for many specific countries and products (Rao et al., 2012).

Among the major rice farming countries in Southeast Asia, i.e. Cambodia, Laos, the Philippines, and Thailand, Vietnam is characterized by very favorable natural and social conditions for irrigated rice production in bulk. Irrigated rice production in the country is based on high soil quality, tropical monsoon weather, numerous water-flows and a large share of the population working in the agricultural sector (more than 66%) (Ya'kub et al., 2012). However, low quality and a lack of professionalism are dramatic problems of the Vietnamese rice export sector (Reardon et al., 2014). Vietnam is still known as a low-quality rice supplier; as a result the Vietnamese rice price is 20% to 30% lower than the Thai rice price (Kubo, 2013). The Vietnamese rice has also lately entered the world export market while the prices were already steadily declining (Nielsen, 2003; Dechachete, 2011; Ramberg, 2011). Currently, the Vietnamese rice sector is characterized by a lack of information with short technical assistances, and low input qualities. It is assumed that there is still a large potential to increase the ability of smallholders to improve production and increase rice yields, overcome existing market barriers, access export markets and increase farm benefits and improve the livelihood of farmers' families. By further promoting the CF scheme in 2002, the Vietnamese government proposed a better frame for the agricultural sector, especially, for the rice sector in the country (Kompas, 2002; Hoang and Yabe, 2012; Vu, 2012).

By farmers' participation in the CF scheme, the production of high-quality products due to improved farmer training and better quality of input factors is a possible solution for Vietnamese rice to more successfully compete on the world market (Dawe, 2004). Furthermore, farmers can expect a price differential due to improved quality and competitiveness. Thus, this scheme is assumed to support smallholders to increase farm benefits. In addition, the CF scheme has been implemented to improve farmers' bargaining power and to create an official ground for smallholders to directly deal with private sectors in the Vietnamese economy. In terms of firm benefits, these decisions also clarify the government's efforts to support the private sector in supplying agricultural inputs to farmers such as seeds, fertilizers, pesticides, credit, and extension services (Ya'kub et al., 2012). Furthermore, this step is also an important procedure to secure national food demand, improve international competitiveness, and upgrade the position of export-oriented rice farmers (Goletti et al., 1997; ADB, 2005). However, in terms of empirical research, up to this date, there are only very few studies that explore the benefits of CF for exporters of rice farmers in Vietnam, especially with regard to the Mekong River Delta (MRD) where about 90% of the national export rice quantity is produced (Loc and Son, 2011). Therefore, there is a lack of in-depth quantitative studies analyzing the effects of CF participation with regard to farmers' marketing decisions, farm performance and technical efficiency, especially, in the export-oriented rice production segment. Against this background it is the objective of this dissertation to close this research gap by providing a better understanding of farmers' decision making with regard to the CF scheme and providing more in-depth insights into the effects of contract farming on efficiency and farm performance.

The conceptual framework of this study is based on the New Institutional Economics perspective proposed by Coase (1937) and Williamson (1975). The underlying ideas about the contract concept explained in the following basically refer back to the three major sub-strands, i.e. agency theory (Ross, 1973), transaction cost theory (Benjamin et al., 1978; Williamson, 1979), and property rights theory (Alchian and Demsetz, 1973; Grossman and Hart, 1986). Thereof, the transaction cost theory is particularly suitable for this study since it describes "uncertainty" as a main dimension (together with "asset specificity" and "frequency") influencing the appropriateness of governance mechanisms in (food) supply chains (Williamson, 1979). The market imperfections due to a lack of information, a limited accessibility of inputs, and a shortage of technical assistance all contribute to "uncertainty" and are related to the research topic and objective of this study. In spite of increasing

pressure to deliver high quality export products at competitive prices to enter the up-market domestic and global value chains, the CF scheme still faces some constraints in emerging and developing economies. This can be explained by reference to the poor coordination among parties, unfavorable contracts, and specified socio-demographic characteristics (Da Silva, 2005; Simmons et al., 2005; Hongdong, 2007; Wang et al., 2014). Nonetheless, these aspects have only been poorly analyzed so far and are not well understood, both from a theoretical and an empirical perspective. This dissertation seeks to overcome this weakness by building up the conceptual framework and empirical methodology to capture these aspects of the export-oriented rice sector in the Mekong River Delta of Vietnam.

We address these research objectives by using primary data collected in early 2016 in the Mekong River Delta (MRD) of Vietnam, where nearly 90% of the country's export rice is produced. The target population of 250,000 households lives in the three main export-oriented rice production regions namely Kien Giang, Can Tho, and An Giang provinces, in the MRD (USDA, 2015). Using a structured questionnaire, 250 households were randomly chosen from the aforementioned provinces. To thereby ensure the comparability of contract and non-contract farmers, we randomly selected 134 contract farmers from contractor lists and 116 non-contract farmers from village official lists of 12 villages. The surveyed households had to meet two criteria: Firstly, they had to be located in the same area as the contract participants, and secondly, they also had to produce export-oriented rice. These selected farmers cumulate rice under written contracts. The contracting company is in charge of specifying the production practices, including input supply (seeds, fertilizer, pesticides), extension services, and the commitment of buying the products (Simmons et al., 2005; Bijman, 2008). In this study, the export-oriented rice farmers were interviewed regarding the information about three types of export-oriented rice producing seasons between November 2014 and October 2015.

In the first paper, we explore the factors that determine smallholder farmers' probability in developing and emerging economies to participate in CF scheme. We particularly focus on the accessibility of market information. A binary probit model is applied to examine the probability to participate in the CF scheme. We follow Heckman's (1979) method to compare the probit results with the maximum-likelihood estimation (MLE) in order to control any sample selection bias (Wynand and Bernard, 1981). Results reveal that farmers' contracting decisions are strongly affected by farm characteristics, market information access, and household characteristics. Remarkably, the accessibility of world market price

information significantly increases smallholders' likelihood to participate in CF. Moreover, the extension service offered by the contractors is considered to be an important motivator for rice smallholders to participate in CF. The availability of price information should be taken into account by the government to motivate the active participation of smallholders in contractual arrangements.

The second paper provides the evidence about how the CF scheme influences household income and rice profit within the export-oriented rice sector in Vietnam. We employ the Ordinary Least Squared (OLS) estimation in combination with propensity score matching (PSM) procedure to control any sampling bias. The result confirms a positive effect of contract participation status on farming households' performance. Particularly, together with "farming size" and "the accessibility of extension services", "the accessibility of world price information" is found as a positive determinant. Moreover, CF participation is considered to be an important influencer for rice smallholders to increase their income and rice profit. In addition, it becomes evident that not only larger-scale farmers but also small-scale farmers can benefit from contract participation. In this connection, the OLS regression in combination with PSM gives noticeable evidence for the role of CF in improving household income of smallholders by 20.87% and rice profit by 30.54% in Vietnam.

In the third paper, we investigate how CF improves the technical efficiency of farming and the technical inefficiency determinants of export-oriented rice production in the country. The Stochastic Frontier Analysis (SFA) is applied to measure the production frontier and the farming technical inefficiency determinants, and PSM is again applied to control for self-selection bias. The results show that the average technical efficiency is of 87.33% with a range between 56.48% and 96.47%. The results suggest convincing opportunities for farmers to increase the productivity of export-oriented rice production in the country by nearly 13% without raising the current resource levels. Land, seed, fertilizer, machine, and labor are identified as the major inputs of the production frontier. Moreover, the socio-demographic characteristics of the sample also slightly influence the TE of rice farming, however their influence is non-significant. Based on the findings, "educational level", "rice farming experience" and "off-farm income" are found as determinants positively influencing rice farming TE. In contrast, there is a low negative effect of credit accessibility. In addition, CF participation is considered to have an influence (even though not a significant one) for rice smallholders to increase their farm TE. In this connection, contract participation could

support not only larger-scale farmers but also small-scale farmers from developing and emerging economies in improving their production patterns.