



Josef G. Knoll-Europäischer Wissenschaftspreis 2014

Josef G. Knoll-European-Science Award Winner 2014

Christoph Sanger “On Small Farms and the Design of Contracts in Agricultural Markets -Experimental Evidence from Vietnam”, Georg-August-University Goettingen, 2012

Summary

Over the past two decades the agrifood industry in developing countries has undergone rapid modernization. Economic growth, rising incomes, urbanization and the spread of western lifestyles have led to changes in consumption patterns in Asia and parts of Africa. As a result, the domestic demand for high-value agricultural products like fruit, vegetables, milk and meat has increased. Meeting consumers' high expectations regarding product quality attributes presents an immense challenge to processors, wholesalers and retailers. As year round supply of consistently high-quality produce is becoming crucial, the degree of control required in the procurement process is increasing and traditional supply chains based on anonymous spot-market transactions are reaching their limits. Hence, vertical integration is encouraged, often through contract farming arrangements between buying firms and selling farmers encompassing a broad array of oral or written agreements that utilize various incentive instruments to ensure a steady supply of high-quality agricultural produce.

The analysis of opportunities and challenges for smallholder participation in emerging high-value markets has drawn considerable attention of researchers. While a large body of literature has emerged, results seem to be mixed. If included in modern supply chains, smallholders can greatly benefit from a combination of access to credit, inputs, and improved technology, leading to higher productivity and higher and more stable incomes. However, there is also evidence that small-scale farmers struggle to comply with contract terms and fulfil the strict quality requirements. Further, the purchasing firms often prefer to source raw material from large farmers due to lower per-unit transaction costs. These factors may lead to a further marginalization of smallholders. In contract farming arrangements, buyers often use output quality as proxy for effort exerted by farmers during the production process. Linking compensation to output quality helps to economize on monitoring costs and can incentivize production of high-quality output. However, there is little information on how to tailor contracts to fit smallholder environments while taking into account specific characteristics of small-scale farmers, such as risk aversion. Further, if farmers' compensation is closely linked to output quality, transparency of the system for quality measurement becomes increasingly important. If product quality attributes are observable to the buyer but not to the selling farmer, opportunistic buyers could report lower than actual output quality, negatively affecting farmers' compensation. If farmers assume buyer's potential opportunistic behavior, they may underinvest, i.e. use suboptimal amounts of input, limiting farm productivity. Therefore, writing effective contracts by adapting incentive instruments to smallholder environments could free yet untapped productivity reserves. In addition, increasing transparency in the procurement process could lift informational constraints that limit farm productivity, increasing

the attractiveness of smallholders as contract partners and encouraging their participation in high-value markets.

We use the example of the Vietnamese dairy sector, which is an interesting case of an emerging high-value market. In close cooperation with a large milk processing company, we conducted a framed field experiment with dairy farmers to test various financial incentives such as bonuses and penalties in a controlled environment. Furthermore, using the same population of milk producers, we ran a field experiment lasting twelve months in which contracts were enforced for randomly selected dairy farmers by providing them with the opportunity to independently verify milk testing results reported by the dairy company. To analyze the experiments, in three rounds of extensive surveys we collected comprehensive household information for all participating milk producers. This information is complemented with detailed production data for each dairy farmer, provided by the dairy company. The results of the framed field experiment shed light on the effectiveness of the contract structure that is currently used by the dairy processor. We find that financial penalties drive farmers into higher input use, resulting in better quality output for the processing company. A conditional bonus payment generates an even higher quality output. We also find that input choice levels are dependent on farmers' socioeconomic characteristics, such as wealth levels, while risk preferences seem to be less important for input choice.

The field experiment yields interesting insights on the impact of more transparency in the supply chain. Providing farmers with the opportunity to verify testing results provided by the dairy company helps to overcome the existing information asymmetry on output quality. We observe a 10 percent higher use of inputs when contracts are enforced, resulting in significantly higher dairy output and welfare levels increase for specific subgroups of farmers. Further, in the underlying case we find that the buying company had not behaved opportunistically, underreporting output quality to accrue quasi-rents despite the existing information asymmetry. Hence, third-party enforcement helped the company to credibly signal its fairness to farmers, leading to a Pareto improvement in the supply chain: While producers benefit directly from higher farm productivity, firms that do not underreport quality are better off due to lower per-unit transaction costs in output procurement.

We show that financial incentives which are linked to quality attributes can be effective in assuring high-quality production. However, the full potential of these conditional incentives unfolds only if the system of quality assessment is transparent. The trend in the results can be generalized over a variety of markets in which quality attributes are important, in Vietnam and elsewhere.

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