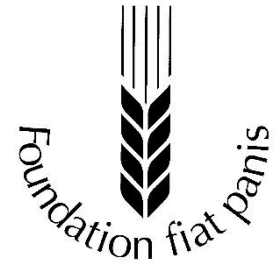


Hermann Eiselen-Wissenschaftspreisträgerin 2022

Hermann Eiselen-Science Award Winner 2022



Anette Ruml “The Effects of Marketing Contracts and Resource-providing Contracts: Comparisons in the Small Farm Sector in Ghana”, University of Goettingen, 2020

Summary

Agri-food systems in developing countries are undergoing a rapid transformation, characterized by modernizing supply chains and the rising importance of higher value products. Participation of smallholder farmers in the emerging modern and high-value marketing channels is considered a crucial contributor for rural development and poverty alleviation. However, market access for smallholders tends to be limited due to multiple market failures, while farm production is often associated with high risks and uncertainties. This leads to an under-investment of smallholders in profitable high-value crops, new technologies, and production inputs. Contract farming has emerged as an institutional response to market failures, with the potential to reduce risks and uncertainties, increase smallholder investments in more profitable crops, inputs and technologies, and thus contribute to higher productivity and income.

In the existing literature, various studies analyzed the effects of contract farming on farm production and household welfare. Recent review articles showed that the results are mixed, which may be due to differences in contract types. A major difference exists between simple marketing contracts that only offer a secure sales market, and resource-providing contracts that additionally provide inputs and other technical services through in-kind credits. Marketing contracts and resource-providing contracts address different constraints and thus can have different effects on the farmers' market access, risk, investment, and production behavior, but a comparison of effects across contract types has rarely been performed. The few existing studies find only minor differences in effects across contract types, potentially due to the relatively low investments required in the production of the particular crops investigated, mainly low-value annual staple foods. As such, it is still unclear whether the increased security through marketing contracts is sufficient to raise agricultural productivity and farm incomes for capital-intensive crops, or whether in-kind credits are required in such a context.

The main contribution of this dissertation is a comparison of the effects of marketing contracts and resource-providing contracts in a perennial plantation crop sector with high investment requirements. Such a capital-intensive crop sector is more suited to investigate differences in contract types. Smallholder farmers face financial constraints for the adoption of high-value crops, and the establishment and maintenance of larger plantations. These financial constraints are directly addressed by resource-providing contracts. It thus has to be tested whether a marketing contract sufficiently incentivizes and enables farmers to increase production investments, or if a resource-providing contract is more suited in such a setting. To the best of our knowledge there is no prior evidence on the effects of marketing contracts and resource-providing contracts in such a capital-intensive high-value crop sector.

We perform the analysis with data from the Ghanaian oil palm sector. Oil palm is one example of a capital-intensive high-value crop that has recently gained in importance among smallholders in different parts of the world. The increasing demand for vegetable oils worldwide has led to changes in the marketing channels for oil palm producers, also in West Africa, where palm oil was traditionally produced mainly for home consumption. In this setting, oil palm continues to gain in importance, and new contract farming schemes are being implemented to meet the rising demand.

The dissertation includes four papers, which are based on a farm household survey conducted in 2018. The survey includes oil palm producers with marketing contracts, with resource providing contracts, and without any contracts. The farmers with marketing contracts supply fresh fruit bunches to a processing mill owned by Wilmar International and the farmers with resource providing contracts to a processing mill owned by Unilever. The villages with contracted farmers were identified with the assistance of both contracting companies and subsequently cross-checked with the help of local authorities. The expansion of the oil palm sector in Ghana provided a unique opportunity to address potential village-level endogeneity concerns through the sampling strategy. Here, the comparison (non-contracted) villages were identified and randomly sampled from a list of villages selected for an upcoming contract farming scheme. These lists were a result of a collaboration with the local Ministry of Food and Agriculture, and farmers were unaware of the upcoming scheme at the time of the survey. Selecting comparison villages chosen for a future contract farming scheme overcomes endogeneity concerns due to non-random placement bias of contract farming schemes, as all villages were considered eligible for contracting from a company perspective. Moreover, all villages were similar in their agroecological suitability for oil palm production and in their socioeconomic demographics.

Beyond contributing to the existing literature through the contract comparison in a capital-intensive high-value crop sector, each of the four papers contributes in different ways, as explained below.

The first paper investigates the effects of marketing contracts and resource-providing contracts on farmers' input use, productivity, and longer-term cropping decisions. The objective is to analyze whether producing oil palm under contract has an effect on these dimensions, and whether the effects of resource-providing contracts differ from those of simple marketing contracts. The analysis sets itself apart from the available literature by providing evidence on long-term changes in land use, and by disaggregating the analysis by small-, medium-, and large-scale farmers to better understand distributional implications. The analysis in this paper is a regression analysis that employs an instrumental variable approach and a willingness-to-pay measure to control for potential endogeneity due to individual selection bias into contract farming. The willingness-to-pay variable was derived through a choice experiment, in which the individual willingness-to-pay for contract farming was measured. The results show that the effects strongly differ across contract types. The marketing contract is insufficient in overcoming farmers' constraints and has no significant effect on almost all of the outcome variables. In contrast, the resource-providing contract has positive effects on production investments, yields, degrees of specialization and scale of production. Moreover, the farm size disaggregation suggests that investment constraints are particularly severe for small-scale farmers, who benefit most from the resource-providing contract. Thus, this paper provides first evidence that a secure sales market is insufficient in overcoming production constraints and that in-kind credits are required in such a capital-intensive crop sector.

This paper was published in *World Development*. Citation: Ruml, A., & Qaim, M. (2020). Effects of marketing contracts and resource-providing contracts in the African small farm sector: Insights from oil palm production in Ghana. *World Development*, 136, 105110.

The second paper analyzes the effects of both contracts on agricultural labor use, household labor allocation, and employment. Contract farming is commonly expected to increase labor use and to create employment opportunities, due to an intensified production and additional labor requirements under contract. This is consistent with the empirical findings of a few available studies. The objective of this paper is to illustrate that the existing findings from previous studies cannot be generalized, as contracts can sometimes also lead to the adoption of labor-saving procedures and technologies. To identify whose employment opportunities are affected, we disaggregate the analysis by gender and age. The employment effects are analysed using exponential double hurdle models, which allow to analyse the incidence and extent of employment as two separate yet interlinked decisions. To overcome issues of individual selection bias we instrument participation in contract farming using a control function approach with generalized residuals. The willingness-to-pay measure is used as robustness check. The findings suggest that agricultural labor use is significantly reduced under contract, which leads to a reallocation of farm household labor towards off-farm employment, but not to a reduction of hired labor use. Moreover, we find heterogeneous effects for male, female, child, and youth labor. Interestingly, these labor use effects do not differ much by contract type.

This paper was published in *Agricultural Economics*. Citation: Ruml, A., & Qaim, M. (2021). New evidence regarding the effects of contract farming on agricultural labor use. *Agricultural Economics*, 52(1), 51-66.

The third paper analyzes the effects of both contracts on total farm household income and income by source. The objective of this paper is to examine the contract induced changes in household welfare in monetary terms, and to identify the mechanisms through which each contract leads to changes in household income. A disaggregation by income source allows for the identification of the underlying mechanisms and spillover effects, which were largely neglected in the existing literature. Not all households have all income sources in this analysis, which is why we use the inverse hyperbolic sine transformation, which is a log-function that accounts for meaningful zeros in the data. The identification strategy in this paper consists of several steps. First, we employ propensity score matching (nearest neighbor and kernel matching) to ensure common support among our sampling. Second, we employ the control function approach using instruments and generalized residuals. As robustness checks, individual willingness-to-pay and risk preference measures are included as additional control variables. Second, inverse probability of treatment weights are employed to increase the comparability of farmers within the sample. We find that both contracts lead to large positive effects on total household income in a similar magnitude, yet through different mechanisms. Farmers under the marketing contract use the increase in oil palm profits to transition out of agricultural production and into off-farm employment. Farmers under the resource-providing contract have a stronger dependency on income from oil palm, which is considerably more profitable under the contract.

This paper was published in the *Australian Journal of Agricultural and Resource Economics*. Citation: Ruml, A., Ragasa, C., & Qaim, M. (2022). Contract farming, contract design and smallholder livelihoods. *Australian Journal of Agricultural and Resource Economics*, 66 (1), 24-43.

The results of the first, second, and third paper illustrate that the resource-providing contract overcomes smallholders' investment and market access constraints and leads to a substantial increase in productivity and income, on average. Yet, additional questions on farmers' preferences and perceptions included in the survey reveal that most farmers actually regret their decision to participate in the contract scheme and would prefer to exit if they could. Thus, the fourth paper discusses problems and constraints of contract farming, as well as the farmers' complaints and concerns to provide additional insights on farmer satisfaction. The objective is to contribute to the limited understanding of farmer satisfaction and dropout behavior, which has not received much attention in the literature. We illustrate the importance of incomplete information and contract understanding among farmers. We also show that farmers mistrust the buying company due to lack of contract transparency, discuss potential determinants, and suggest directions for future research.

This paper was published in the *Journal of Development Studies*. Citation: Ruml, A., & Qaim, M. (2021). Smallholder farmers' dissatisfaction with contract schemes in spite of economic benefits: Issues of mistrust and lack of transparency. *The Journal of Development Studies*, 57(7), 1106-1119.

Overall, our findings illustrate that the effects of contract farming strongly depend on the type of contract. We identify sizeable differences in the effects between marketing contracts and resource-providing contracts, which illustrates that not all contracts are useful in every situation. Moreover, the mechanisms of the effects can vary greatly across types of contracts, which should not be ignored when designing contract farming policies and when estimating resulting effects.

Publication List - peer reviewed

Ruml, A., Ragasa, C., & Qaim, M. (2022). Contract farming, contract design and smallholder livelihoods. *Australian Journal of Agricultural and Resource Economics*, 66(1), 24-43.

Ruml, A., & Parlasca, M. C. (2021). In-kind credit provision through contract farming and formal credit markets. *Agribusiness*.

Debela, B. L., Ruml, A., & Qaim, M. (2021). Effects of contract farming on diets and nutrition in Ghana. *Applied Economic Perspectives and Policy*.

Ruml, A., & Qaim, M. (2021). New evidence regarding the effects of contract farming on agricultural labor use. *Agricultural Economics*, 52(1), 51-66.

Ruml, A., & Qaim, M. (2021). Smallholder farmers' dissatisfaction with contract schemes in spite of economic benefits: Issues of mistrust and lack of transparency. *The Journal of Development Studies*, 57(7), 1106-1119.

Ruml, A., & Qaim, M. (2020). Effects of marketing contracts and resource-providing contracts in the African small farm sector: Insights from oil palm production in Ghana. *World Development*, 136, 105110