学位論文内容の要旨

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学位論文題名

Linkage between farm and non-farm sectors and its impact on agricultural production: Evidence from Vietnam

（農業と非農業セクター間の連関とその農業生産へのインパクト：ベトナムにおける実証）

1. Introduction

The non-farm sector of developing countries has gradually been expanding and is considered to play a progressively important role in household income. In Vietnam, the renovation policy—the *Doi Moi* policy—since 1986 has changed the rural economy and brought development to the non-farm sector of rural areas. The first few years of the 21st century witnessed especially strong development in the non-farm sector in Vietnam's rural areas. The proportion of rural non-agricultural households increased dramatically from 28.9% in 2006 to 46.2% in 2016. With this transformation, what has been the impact of the non-farm sector on agricultural production? In a developing country like Vietnam, where the agricultural sector still plays a central role in rural development, and the credit and labor markets are often inadequate or imperfect, the relationship between farm and non-farm sectors remains an issue of concern. This study investigated how the non-farm sector affects agricultural production in the context of imperfect markets and the development of Vietnam's rural economy. The objectives of this study were: (1) to examine the relationship between farms' household participation in non-farm activities and input expenditures in agricultural production activities; and (2) to estimate the effect of the non-farm sector on agricultural output and performance—in particular, on agricultural value-added and production efficiency. The findings of this study will contribute to the existing literature on the importance and the role of the non-farm sector in agricultural production activity and production efficiency through the loosening liquidity constraints of this income source. This study used data from the 2012 Vietnam Living Standards Survey.

2. The impact of the non-farm sector on agricultural inputs expenditure

This study examined the effect of non-farm income on agricultural input expenditures in Vietnam—in particular, expenses for purchased inputs (such as seeds, fertilizer, breeding, feed, herbicides, and pesticides), hired machines, and hired labor. We applied the Instrumental Variables (IV) Tobit approach to produce a consistent estimation of non-negative agricultural input expenditure equations. The results confirmed a significant and positive effect of non-farm activities on agricultural expenses in Vietnam. This result indicated that Vietnamese farm households that could access other income sources in the non-farm sector could spend those earnings for purchasing agricultural inputs and hiring machine and labor to compensate for shortfalls in family labor. The results of the average partial effect of non-farm income on agricultural inputs expenses indicated that an additional Vietnamese đồng (VND) in non-farm income leads to a 0.412 VND increase in agricultural input spending. However, our findings showed that farm households only use a small proportion of the non-farm income for hiring machines and labor. The other finding also indicated that developed regions seem not to use the non-farm income for agricultural activity, while less-developed regions tended to use the non-farm income to invest in agricultural production.

3. The impact of the non-farm sector on agricultural value added and production efficiency

The production function and stochastic frontier production analysis were applied to estimate the impact of the non-farm sector on the efficiency of agricultural production. The instrumental variables (IV) method was also applied to address the endogeneity problem of non-farm variables. Production frontier and technical efficiency could be estimated in two steps. The stochastic production frontier was estimated to derive the inefficiency level of each household in the first step; in the second stage, we estimated the impact of the activities of the non-farm sector on agricultural production inefficiency. The estimation results indicated that the non-farm sector had a positive effect on both the agricultural value added and production efficiency. The results meant that a 1 million VND increase in non-farm income enhanced the agricultural value added by 0.23%, or approximately 0.08 million VND, on average, and the inefficiency level decreased by 0.13%. The participation of the household head or spouse in non-farm jobs increased the agricultural value added by 44.1%, or about 16.22 million VND, and led to a reduction in the inefficiency level by 18.9%.

4. Conclusion

The study contributes to the literature on the relationship between the farm and non-farm sectors in Vietnam. The non-farm sector supports agricultural production through a positive impact on agricultural expenditures; this income source can provide cash for farmers to invest in farm production. Thus, non-farm income can help farmers loosen credit constraints. The positive effect of non-farm activities on agricultural value added and technical efficiency indicates that the use of these earnings for investment in agricultural production can enhance and increase agricultural output and production efficiency. Therefore, to develop the rural economy, policies targeting farm households should consider the non-farm sector, especially policies that support the diversification of income sources of farm households to link the agriculture and non-farm sectors.