

Factors Affecting the Selection of Agricultural Contracts from the Viewpoint of Farmers in the County of Bardsir: Method of Mixed Logit

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ABSTRACT

In the absence of capital and agricultural marketing problems, agricultural contracts are good ways to raise capital, ensure product sales, create fair prices, and ultimately, the balance development of the agricultural sector. It will lead to a more balanced distribution of the benefits of commercialization, with greater access to opportunities for more of the sector's activists. Cultivation contracts can help farmers and the industries, due to the possibility of cultivating different plants and the existence of processing industries in Bardsir. In this regard, 130 farmers were selected by random cluster sampling, in 2017-2018. Subsequently, four types of contracts were obtained based on the factors of pattern of cultivation, contract period, control over production, supply of inputs by the contractor and the manner of payment, using the fractional factorial design. The contractor's powers increasing from the first to the fourth contracts. Then, the effects of age, cultivar, history of agriculture, ownership, education, product diversity and the history of participation in agricultural contracts on the contracts were investigated, using the mixed logit model. The findings show that by increasing the area under cultivation, ownership and educational level, the probability of choosing the first to the third contracts increases compared with the fourth one (base contract), while with diversity of cultivation and farmer's familiarity with agricultural contracts, the base contract would be preferred. With an increase in work experience in agricultural activity, a change in the level of ownership from rent to a civilian, and an increase in the level of education, the probability of choosing the fourth contract decreased by 1.6, 14.5 and 22 percent, respectively. While diversity of cultivation and the history of participation in contracts, the chances of choosing this contract increased by 10% and 20% respectively. Therefore, the contractors is better to pay attention to farmers who have less cultivated land, more diverse products and lower education levels, to increase productivity and support micro-farmers, by controlling and supervision.

Keywords: Contract farming, Bardsir County, Factorial Factorial Design, Mixed Logit Model.

JEL Classification: M31, R31

Introduction

Contract farming is considered as a market mechanism in development of this sector and is known as a tool for managing the risks of the agricultural sector, including production, climatic and natural disasters and economic risks. In the absence of capital and agricultural marketing problems, agricultural contracts are good ways to raise capital, ensure product sales, create fair prices, and ultimately, the balance development of the agricultural sector. It will lead to a more balanced distribution of the benefits of commercialization, with greater access to opportunities for more of the sector's activists. Cultivation contracts can

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help farmers and the industries, due to the possibility of cultivating different plants and the existence of processing industries in Bardsir.

Methodology

It is well known that farmers' preferences are remarkably heterogeneous. In choice modeling, adequate modeling of heterogeneity is important for many reasons. In order to elicit farmers' preference for contract, the choice modeling approach with heterogeneity is used. In order to achieve farmers' preference for contracts, choice model has been used taking into account the heterogeneities. The multinomial logit model (MNL) is a fundamental basis for the analysis of discrete choice. Due to several shortcomings of the basic of the MNL model, one commonly used method is the random coefficient specification of the mixed logit model (MXL). This model has been used in a number of studies of choice experiment. The estimated parameters of the MXL model are analyzed in terms of their marginal effects, which measure the change in the probability of an event given a unit change in one explanatory variable, keeping constant all other variables.

Data on consumer preferences were collected based on stated preferences. This method has the advantage of testing the consumers' preference before releasing a product to the market. In this regard 130 farmers in Bardsir County were selected by a random cluster sample, in 2017-2018. A fractional orthogonal design was used to select potential contracts. In this regard, important and influential components of contracts and their levels were determined. Indeed, 16 hypothetical contracts were selected out of 192 contracts, based on the factors of pattern of cultivation, contract period, control over production, supply of inputs by the contractor and the manner of payment. The 16 alternatives were divided into four groups, so that the contractor's powers increasing from the first to the fourth contracts. Then, the effects of age, cultivar, history of agriculture, ownership, education, product diversity and the history of participation in agricultural contracts on the contracts were investigated, using the mixed logit model.

Results and discussion

The results show that 49% of farmers cultivated a variety of crops, and 59% were familiar with agricultural contracts. The mean age, area under cultivation and work experience in agriculture were 51.57 years, 9.74 hectares and 26.58 years, respectively. In estimating mixed logite model, the fourth contract with the highest frequency was the base one. In this contract, the farmer tends to change the cultivation pattern, preferring a one-year contract period, control over crop production, provision of inputs by the contracting party, and total contract amount at harvest time. Other contracts are compared with the base one. The results show in the first contract, the variables of cultivated area, agricultural history, ownership and education are statistically significant. The farmers who have more experience in agricultural activities, have a higher level of education, a large area under cultivation and own land prefer the first contract to fourth one. In other words, they no longer want to change the cultivation pattern, prefer the shorter period of the contract, do not accept the input by the contracting party and control it, and agree to pay the full amount of the contract at harvest time. The marginal effects show increasing of each hectare of cultivated area and the level of education, the probability of choosing the second contract increases by 1.3 and 17.5 percent, respectively, while with the increase of one year of agricultural experience, the probability of choosing this contract is decreased by 1.4 percent. In other words, like the first contract, they do not want to change the cultivation pattern, prefer the shorter contract and agree to pay the full amount of the contract at harvest time, while accepting the control and provision of inputs by the contracting party.

With increasing age and variety of products, the probability of choosing the third contract decreases compared to the base one. The marginal effects show the probability of choosing third contract decreases by 1.3 percent, as the farmer grows older by one year. In general, older farmers with higher levels of education and landowners prefer the third contract. With an increase in work experience in agricultural activity, a change in the level of ownership from rent to a civilian, and an increase in the level of education, the probability of choosing the fourth contract decreased by 1.6, 14.5 and 22 percent, respectively. While diversity of cultivation and the history of participation in contracts, the chances of choosing this contract increased by 10% and 20% respectively. To encourage farmers to contract farming, it is recommended that the Agricultural Jihad Organization or the private sector, while offering a price that is somewhat higher than the market price, pay attention to farmers who have less cultivated area, lower level of education, and product diversity and also are elder. In this case, productivity is expected to increase due to the control and supervision of the contracting party. Higher prices are offset, support micro-farmers, and facilitate the transition from subsistence farming to commercial agriculture, which is a developmental trend in agriculture and the economy.