An Analysis of the Intention to Purchase Agricultural Insurance among Tibetan Residents from the Perspective of Family Life Cycle – Survey Data Based on Tibetan Regions in Four Provinces of China

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Abstract: Agricultural insurance is a most significant means for farmers to evade production risks and prevent repoverty as a result of disasters, and it plays a significant role in overcoming poverty with high quality in highly impoverished areas. This paper sets up a phase division standard that suits the family life cycle of Tibetan regions in Sichuan Province and makes a binary logistic regression analysis of the influential factors in the intention to purchase agricultural insurance among Tibetans at different stages based on the 480 samples obtained from a field survey of Tibetan regions in Sichuan Province in 2018. The result shows that family life cycle has an obvious effect on Tibetan people's intention to purchase agricultural insurance and the influential factors and influential directions of different phases of family life cycle in the intention to purchase agricultural insurance differ obviously.

1. Introduction

As the "patron saint" for modern farmers, agricultural insurance plays an irreplaceable role in ensuring continuity of agricultural production and stability of farmers' living. Also, as an important approach for farmers to autonomously anticipate and avoid risks and reduce losses, agricultural insurance plays an important role in construction of an agricultural risk prevention.

The government has paid high attention to agricultural insurance ever since 2014. The Central Committee of the Communist Party of China has released consecutively the first document with the theme of "issues related to agriculture, rural areas and rural people" in which agricultural insurance was regarded as an important constituent part in resolving the "Three Rural Issues". In addition, all sorts of agricultural insurance businesses have started up in all areas across the entire country. Nevertheless, the agricultural insurance in Tibetan regions in Sichuan Province studied in this paper is still at a fledging stage and the entire scale of agricultural insurance is still lower than the average level of the whole country although the general development trend of agricultural insurance has a positive prospect. Therefore, it is hard to promote agricultural insurance in in Tibetan areas in Sichuan Province as a result of the primitive social manners of Tibetans, out-of-the-way channel to information acquisition, outdated thoughts of famrers and herdsmen, lack of fundamental financial awareness and weak consciousness of social risks.

Family life cycle is a reciprocating process which describes formation, extension, stability, shrinking and disintegration of a family. Different family life cycles have different risks and consumption preference types, which means family life cycle is a significant perspective to interpret the consumption decision making behavior of a farmer and herdsman's family in Tibetan areas. Purchase of agricultural insurance is part of the expenditure of Tibetan households, so it is of high theoretical value and realistic significance to make an in-depth analysis of the stimulative factors and restrictive factors in the demand of Tibetan people on agricultural insurance by means of

analyzing the influential factors of Tibetan people's intention to purchase agricultural insurance from the perspective of family life cycle.

2. Literature Review and Theoretical Carding

Different scholars hold different opinions in terms of the current literature on the influential factors in the intention to purchase agricultural insurance. A lot of scholars conduct their study from the perspective of individual and family characteristics of peasant households. They focus on the age, gender and farming years of the head of a peasant household as well as the cultivated areas of the household and the population of farming to explore their impacts on the intention to purchase agricultural insurance [1] [9]. A small part of scholars indicate that the education years of peasants, the proportion of agricultural income to the total income and the cognition of peasants towards agricultural insurance have positive impacts on the intention to purchase agricultural insurance [2]. There are other scholars who hold the viewpoint that the intention of peasant households to purchase agricultural insurance increases with augmentation of their cultivated areas [3]. Still, other scholars respectively analyze the influences of variety and rate of agricultural insurance, levels of assurance [4] and government subsidy [5] on the demand on agricultural insurance.

In terms of the special feature of family life cycle, the theory of family life cycle regards life as limited and separable which has its own uniqueness and exclusiveness [8]. Zhao Zhouhua (2018) stated the time preference of a family might differ with different family features and at different stages [7]. Liu yanwen (2016) held the view that family consumption and investment might take a rippling change within the entire life cycle. He set up a family consumption and investment decision-making model based on the hypothesis of family life cycle and verified that the subjective discount factor and coefficient of risk aversion at different stages might affect the investment and consumption decision of a family, which further affected the consumption level of the family [6].

To sum up, agricultural insurance pertains to consumption insurance and the intention to purchase agricultural insurance is inseparable from the consumption decision-making behavior of a family and its current consumption level. Naturally, the purchase intention may be affected by the different consumption decision-making behaviors and consumption levels caused by the uniqueness of different stages of family life cycle. This paper studies the influential factors of family life cycle in the intention to purchase agricultural insurance among the special subject of Tibetan regions in the four provinces. It is concluded, from an analysis of the consumption decision-making behavior of a family, that different stages of family life cycle have different impacts on the intention of Tibetan famers to purchase agricultural insurance. The study aims to provide empirical evidence and policy recommendations for healthy development of agricultural insurance in the Tibetan regions in the four provinces.

3. Classification of Phases of Family Life Cycle

This article classifies family life cycle into the six phases of start-up family, growing family, burdening family, mature family, shrinking family and declining family based on the classification methods of previous studies on family life cycle and considering the features of Tibetan regions in the four provinces (See Table 1). In this article, the age of 16 is regarded as a phase classification evidence for the reason that the education level of Tibetan population is relatively low. It is shown from the data in the 454 effective samples, the education background if a large majority of heads of the households is the primary school and even below. The proportion of uneducated household heads is as high as 45.78%. Therefore, most Tibetan people have to become a labor force at a relatively young age.

Table 1. Framework of classification of family life cycle

Phases of family life cycle among Tibetans	Characteristics of household population
Start-up family	Husband and wife, without a child
Growing family	The youngest child or grandchild is younger than 16 years old, without old people over 60 years old
Burdening family	The youngest child or grandchild is younger than 16 years old, with old people over 60 years old
Mature family	Only population between 17 and 60 years old
Shrinking family	Population between 17 and 60 years old, with old people over 60 years old
Declining family	Only old people with permanent residence

4. Data Source, Variables Selection and Model Specification

4.1. Data Sources and Basic Characteristics of Samples

All the data used in this article come from the field survey conducted in Tibetan regions in the four provinces in 2018 and the paper adopts a stratified random sampling method for the survey. According to the economic development level, the paper selects four sample counties (districts) respectively in the Tibetan regions of the four provinces of Sichuan, Gansu, Qinghai and Yunnan and draws at random multiple villages from each county (district) and multiple households from each village. In the survey, altogether 480 questionnaires are issued and 454 effective questionnaires are returned, with an effective rate of 94.6%.

According to the existing sample, the proportion of families which have the intention to purchase agricultural insurance at the six phases of family life cycle presents a pattern of "M" and two peak values appear, namely, burdening family and shrinking family, respectively with a proportion of 71.21% and 67.69%. Obviously, the demand of these two types of families on agricultural insurance is more exuberant. By contrast, the proportion of start-up family, growing family, mature family and declining family is respectively 28.57%, 45.91% and 49.53%.

4.2. Selection of Variables and Descriptive Statistical Analysis

4.2.1. Selection of Variables

1) Dependent variables. In this paper, the intention to purchase agricultural insurance among Tibetans refers to the actual situation of purchasing agricultural insurance in the following year.

2) Independent variables. This paper introduces three types of independent variables. The first type is the variable of family life cycle, in which the classification of family life cycle aforementioned is regarded as an explanatory variable and start-up family is regarded as a reference. The second type is the variable of individual characteristics, which includes the age and educational background of respondents. The third type is the variable of family characteristics, which includes the proportion of agricultural household income to the total family income, the proportion of human relationship income to the total family income and the loan of the family. The fourth type is the variable of guarantee slip characteristics, which includes the proportion of compensation from the insurance companies, the satisfaction with services provided by the insurance companies and the satisfaction with the amount of the guarantee. The fifth type is the variable of the government. This variable refers to the awareness of the respondents in the proportion of the central government's subsidy, which reflects the impacts of the governmental support on the intention of Tibetan people to purchase agricultural insurance.

4.2.2. The Descriptive Statistical Analysis of Variables

Table 2 shows definition of variables selected and the result of the descriptive statistical analysis. It can be seen from the table that a proportion of 69% Tibetan people still have the intention to

purchase agricultural insurance in the following year and relatively recognize agricultural insurance. The mean value of all the phases of family life cycle is 3.18 and the mean value of the educational background of the respondents is 1.91, which indicates the average level of the family life cycle among Tibetan households is at the stage with relatively high living pressure and relatively low educational status. The mean value of the proportion of agricultural income to the total family income is 0.4 which is a stable income source for Tibetan residents. However, more than half the number of Tibetan residents still undertake a loan and they are generally satisfied with the service attitude and guarantee amount of the insurance companies and are relatively aware that the central and local governments have the subsidy for insurance premium. The mean value of the ages of the respondents is 46.29, whereas the variance is 116.35. This indicates a relatively large discrepancy between the ages of the respondents and their average age as most of the respondents are juveniles or elderly people.

Table 2. Definition of variables and result of descriptive statistical analysis

Types of variables	Names of variables	Explanation of variables and their valuation	Mean value	Variance
Dependent variables	Whether having the intention to purchase agricultural insurance in the following year	No=0, Yes=1	0.69	0.21
Explanatory variables	Phases of family life cycle	Start-up family=1; Growing family=2; Burdening family=3; Mature family=4; Shrinking family=5; Declining family=6	3.18	1.70
	Age of the respondents		46.29	116.35
	Educational background of the respondents	Uneducated=1, educated halfway from the primary school, but can read and write =2, educated from the primary school =3, graduated from the junior middle school =4, graduated from the senior high school/professional high school /technical secondary school =5, graduated from the junior college =6, undergraduate college=7, master and above=8	1.91	1.29
	The proportion of agricultural income to the total family income		0.4	0.12
	The proportion of human relationship expenditure to the total family income		0.13	0.05
	Whether there is a loan	No=0, Yes=1	0.55	0.25
	The proportion of compensation by the insurance companies	10%-30%=1, 30%-50%=2, 50%-80%=3, Above 80%=4	2.14	0.73
	Satisfaction with services provided by insurance companies	Extremely dissatisfied=1, dissatisfied =2,general=3, satisfied=4, Extremely satisfied =5	3.58	0.39
	Satisfaction with the amount of guarantee	Extremely low=1, relatively low=2, general=3, satisfied=4	3.19	0.50
	Whether being aware that both the central and local governments have insurance premium subsidy	Not aware=1, aware but unaware of the proportion=2, definitely aware of the subsidy proportion=3	1.51	0.37

5. Empirical Analysis

5.1. The Impacts of Family Life Cycle on the Intention to Purchase Agricultural Insurance among Tibetan Residents

5.1.1. Construction of the Model

The dependent variable of "the intention to purchase agricultural insurance among Tibetan residents" becomes a binary variable and the valuation of 1 signifies "yes" and 0 signifies "no". The authors in this paper choose to set up a binary logistic regression model to make an analysis on the relationship between the variable of family life cycle and the intention to purchase agricultural insurance. The function expression of the regression model is:

$$Y = \ln(\frac{P}{1-P}) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n + \mu \tag{1}$$

Where, β_0 is a regression intercept, X_1, X_2,…, X_n are independent variables, β_1,β_2,…,β_n are the regression coefficients of the corresponding independent variables and μ is a stochastic disturbance.

5.1.2. An Analysis of the Estimation Result

Considering there is only a small number of samples from start-up family and declining family, these two types of families are removed. And only the relationship between the family life cycle and the intention of Tibetan residents to purchase agricultural insurance in the other four types of growing family, burdening family, mature family and shrinking family is analyzed. It can be seen from the estimation result of the parameters that the intention of Tibetan residents to purchase agricultural insurance differs at different phases of the life cycle of a family.

The intention to purchase agricultural insurance among burdening Tibetan families is the strongest because its regression coefficient is 3.616, which is larger than the regression coefficients of any other phases. Also, its significance level has passed the significance test at 1% and presents a significant positive correlation. Families at this stage have to care for the elderly in addition to their responsibility to raise the offspring. Thus, they suffer from double pressure and give more emphasis on agricultural income and risks, to the extent that the positive effect generated in the intention to purchase agricultural insurance is far beyond the negative effect generated in the intention to purchase agricultural insurance due to restricted economic conditions.

The regression coefficient of growing family is 1.856 which is smaller than the regression coefficients at any stage. This type of families has the least intention to purchase agricultural insurance because they undertake heavy responsibilities to raise the offspring which incurs large family expenses. Therefore, they have fewer funds to purchase agricultural insurance and the influences on the intention to purchase agricultural insurance present a relatively significant negative correlation.

The intention to purchase agricultural insurance among mature family and shrinking family presents a significant positive correlation and the regression coefficients are respectively 2.231 and 2.569. The reason is that the average age of the population of family members at these two stages is relatively large and the average labor capacity is on the decline, so their capacity of tolerating risks has died away and it is quite probable that they might transfer to risk aversions.

5.2. An Analysis of Influential Factors at Different Stages of Family Life Cycle

5.2.1. A Principal Component Analysis of the Influential Factors in the Intention of Tibetan Residents to Purchase Agricultural Insurance

Considering that the number of samples at each stage after the family life cycle is classified and that there might be a need to eliminate the multiple collinearity among different variables, the authors in this paper adopt a principal component analysis for dimensionality reduction and then use logistic regression to analyze the influential factors in the intention of Tibetan residents to purchase agricultural insurance.

The SPSS19.0 statistical analysis software is used to make a principal component analysis on the influential factors in the intention to purchase agricultural insurance among Tibetan residents at different stages of the family life cycle. This test verifies that a correlativity exists between variables, which is suitable for a principal component analysis.

In the cases of growing family, burdening family and shrinking family, F1 reflects the information about the four variables of the guarantee amount, the satisfaction with services provided by the insurance companies and the proportion of the compensation by the insurance companies; F2 synthesizes the information about the three variables of the proportion of agricultural income to the total family income of the current year, the proportion of human relationship expenditure to the total family income of the current year and whether there is a bank loan; F3 reflects the information of the two variables of the educational background and the age of the respondents. In the case of the mature family, what F1 reflects is the same with the information of the above three types, but what F2, F3 and F3 reflect is different. F2 synthesizes the information of the two variables of the proportion of agricultural income to the total family income of the current year and the age of the respondents, F3 indicates the educational status of the respondents and F4reflects the information of the two variables of whether there is a bank loan and the proportion of human relationship expenditure to the total family income of the current year.

5.2.2. Construction of the Logistic Regression Model

Taking the principal components F_1, F_2 and F_3 as new variables, this study sets up a Logistic regression model for the influential factors in the intention of Tibetan residents in the four provinces to purchase agricultural insurance and uses SPSS 19.0 software to make an analysis. The probability that corresponds to the chi-square value of the goodness of fit is all below 5%. This indicates that all the regression coefficients of the model are not 0 simultaneously and the linear relation between independent variables and dependent variables are significant, which proves the model is rational. At the same time, the probability of the Hosmer-Lemeshow statistical value is also larger than the significance level of 0.05. Hence, it is suggested not to reject the null hypothesis and the goodness of fit of this model is relatively high.

According to the estimation result of the logistic regression model, the significance levels that correspond to the Wald values of F3 and F4 are both larger than 0.05, so the impacts of F3 and F3 on the intention to purchase agricultural insurance among Tibetan residents are not significant and F3 and F3 should be eliminated.

Table 3. The estimation result of the logistic regression model

		F_1	F_2	F_3	F_4	Constant terms
Growing family	Regression coefficient	2.325	0.205	-0.228	—	-0.663
	Wald value	53.621	0.671	0.701	—	5.838
	Significance	0	0.413	0.402	—	0.016
Burdening family	Regression coefficient	2.148	-0.26	0.268	—	1.716
	Wald value	17.647	0.408	0.32	—	11.687
	Significance	0	0.523	0.572	—	0.001
Mature family	Regression coefficient	3.164	0.181	-0.511	-0.755	0.94
	Wald value	31.713	0.165	2.918	1.61	2.249
	Significance	0	0.685	0.088	0.204	0.134
Shrinking family	Regression coefficient	2.114	-0.609	0.237	—	1.227
	Wald value	19.443	3.099	0.5	—	8.026
	Significance	0	0.078	0.479	—	0.005

From the absolute value of the regression coefficients of all influential factors presented in Table 3, the following four variables have significant effects on the intention of Tibetan residents to purchase agricultural insurance at the four stages of the family life cycle: the proportion of compensation by the insurance companies, satisfaction with services and guarantee amount provided by the insurance companies and awareness of the proportion of the government subsidy. In other words, so long as the proportion of compensation by the insurance companies is high and their services and guarantee amount are extremely satisfying, Tibetan residents will have the strong intention to purchase agricultural insurance. Likewise, the more aware of the government subsidy Tibetan residents are, the more likely it is to stimulate the intention of Tibetan residents to purchase agricultural insurance. Coincidentally, these four influential factors are exactly the most significant variables in the Logistic regression. Hence, the influences of these four variables on Tibetan residents' intention to purchase agricultural insurance are of crucial importance.

Moreover, the proportion of human relationship expenditure at each stage to the total income of a household at the current year has a negative effect on the intention of Tibetan residents to purchase agricultural insurance. That is to say, if a family lays emphasis on its human relationship expenditure, it may cripple its intention to purchase agricultural insurance. Nonetheless, the impacts of human relationship expenditure of these four types of families on the intention to purchase agricultural insurance decrease progressively. A possible explanation is that progressive increase of the family life cycle also means an increase of the average family age. When the social experience gradually accumulates, the mental intelligence and perception becomes mature and it is less likely that a family member sways his thoughts if influenced by others.

In view of the influential factors which distinguish from each other at different stages, we first analyze the variable of individual characteristics. It is shown from the regression result that the intention to purchase agricultural insurance declines with the increase of ages in the cases of growing family and burdening family. A possible reason is that the young groups are the primary labor forces among the family members in these two types of families, so they have greater capacity of creating wealth and are more likely to have the tendency not to avoid risks. The intention to purchase agricultural insurance is strengthened with the increase of ages in the two cases of mature family and shrinking family. As for the two types of burdening family and mature family, if they receive higher educational status, the intention to purchase agricultural insurance becomes weaker. This is because the individuals who have higher educational status have accumulated relatively much health and they have no concern for risks in agricultural production.

Table 4. The regression coefficients of the logistic model at all the stages of the family life cycle

	Growing family	Burdening family	Mature family	Shrinking family
X1	0.078	0.207	-0.034	-0.016
X2	0.082	-0.376	-0.124	0.019
X3	-0.136	-0.194	-0.377	0.241
X4	-1.237	-0.616	-0.579	-0.357
X5	0.301	-0.062	0.208	0.365
X6	1.175	1.153	1.512	1.014
X7	1.155	1.05	1.534	1.068
X8	1.229	1.318	1.562	1.064
X9	1.072	1.033	1.338	0.96

Then, we analyze the variable of family characteristics. As for the three types of growing family, mature family and declining family, existence of bank loans might stimulate them to purchase agricultural insurance. This is because bank loans might incur burdens on herdsmen in both the

economic and spiritual aspects. Thus, risk aversion for agricultural losses seems quite important to them and their intention to purchase agricultural insurance is strengthened. At the same time, loans add to their disposable funds, so their intention is also strengthened. However, the more bank loans assumed by a burdening family, the weaker the Tibetans' intention to purchase agricultural insurance. This might be the reason that the Tibetan residents have to be cautious in terms of funds disposal as a result of the double pressure generated by bank loans, which furthermore reduces the intention to purchase agricultural insurance.

6. Concluding Remarks and Recommendations

The main conclusions of this study can be summarized as follows. First, the result of the descriptive statistical analysis shows that the intentions of Tibetan residents to purchase agricultural insurance at different stages of the family life cycle are not exactly the same. Generally, the two types of burdening family and shrinking family have the intention to purchase agricultural insurance, with a rate of respectively 71.21% and 67.69%. By contrast, there are only 28.57% of start-up families have the intention to purchase agricultural insurance. Second, the Logistic regression analysis result shows the variable of family life cycle has a significant impact on the intention of Tibetan residents to purchase agricultural insurance. In addition to start-up family and declining family, the burdening family has the strongest intention to purchase agricultural insurance, whereas the growing family has the weakest intention to purchase agricultural insurance. This coincides with the descriptive statistical analysis result. Third, both commonalities and differences exist in the influential factors of different phases of family life cycle in the intention to purchase agricultural insurance. The same influential factors are the variable of the guarantee slip and the variable of the government. Of course, there are also different influential factors. For instance, an increase of age weakens the intention to purchase agricultural insurance in the two types of growing family and burdening family, while it strengthens the intention to purchase agricultural insurance in the other two types of mature family and shrinking family. The second different influential factor is the educational status. The higher the educational status, the weaker the intention to purchase agricultural insurance in the two types of growing family and shrinking family, while the stronger the intention to purchase agricultural insurance in the other two types of burdening family and mature family. The third different influential factor is bank loan. Existence of bank loans stimulates the intention to purchase agricultural insurance in the three types of start-up family, mature family and declining family, while more bank loans weakens the intention of Tibetan residents to purchase agricultural insurance in the type of burdening family.

Based on the above conclusions, we may get the following policy implications. First, a common practice for all Tibetan residents at all the stages of the family life cycle is to strengthen the propaganda work to enable Tibetan residents to have a more deeper understanding in the subsidy provided by the central government. In the meanwhile, it is necessary to improve the service quality and ensure the proportion of compensation premium and satisfaction with the amount of the insurance. Second, it is suggested to make full use of bank loans and to exert the synergistic effect of loans in the intention to purchase agricultural insurance in the three types of growing family, mature family and declining family. Under the circumstance when the family life cycle of Tibetan residents will not change within a short period of time, it is necessary to strengthen intellectual education among growing family and shrinking family. Third, in the process of practice, there is a need to take into consideration of the regularities and characteristics of all types of families at different stages of family life cycle, take accurate incentive measures and effectively improve the popularity rate of agricultural insurance.

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References

[1] Zhao, G. and Zhou, W. (2014) Influential Factors in the Intention to Purchase Agricultural Insurance – Based on 988 Survey Questionnaires in Hebei Province, China. Jiangsu Agricultural Science, 7.

[2] Xu, K., Wang, R. and Jiang, G. (2016) An Analysis of the Intention to Purchase Agricultural Insurance. China Statistics, 4.

[3] Zhang, Z. (2012) Structure of the Price of Agricultural Insurance and Establishment of the Proportion of Insurance Premium Subsidies. Public Finance Research, 10.

[4] GU, Z., Lu, Y., Zhang, W. and Tang, H. (2012) An Analysis of the Demand on Agricultural Insurance Based on the Perspectives of Types of Insurance and Level of Insurance Acceptance. Insurance Studies, 11.

[5] Sun, X. and Zhong, F. (2009) An Analysis of the Influential Factors in the Proportion of Agricultural Insurance Premium Subsidies – A Case Study of Data about the Willingness to Pay among Peasant Households in the three provinces of Xinjiang, Heilongjiang and Jiangsu. Journal of Guangdong University of Finance, 4.

[6] Liu, Y. and Fan, Y. (2016). A Simulation Study on the Consumption and Investment Decision Making in the Family Life Cycle in China. Agricultural Research, 7.

[7] Zhao, Z. and Wang, S. (2018) Consumption Characteristics of the Life Cycle of Rural Residents and the Regional Differences. Population and Economics, 2.

[8] Tian, F. (2011) Family Life Cycle of Contemporary China. Social Sciences Academic Press.

[9] Okoffo, E.D., Denkyirah, E.K., Adu, D.T. and Fosu-Mensah, B.Y. (2016) A Double-Hurdle Model Estimation of Cocoa Farmers' Willingness to Pay for Crop Insurance in Ghana. SpringerPlus.