

The attitudes of farmers towards agricultural insurance: The case of Erzurum, Turkey

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Über die inneren Einstellungen von Landwirten auf dem Weg zur Errichtung landwirtschaftlicher Versicherungen: Eine Fallstudie aus Erzurum, Türkei

1 Introduction

All economic activities have risks and uncertainties that can be predicted to some extent or not at all beforehand. Since it is not possible to be sure of the results of the decisions, risk and uncertainty are inevitable in almost every field of life. Agricultural production has natural (climate change, diseases, etc.) and economical risk (increasing the price of inputs, and decreasing the price of products). So in agriculture sector, the majority of enterprises is trying to direct their activities by considering about risk and uncertainty. But whenever farmers or agricultural enterprises loose big

sum of income in agriculture, they try to be compensated for their losses by the Ministry of Agriculture in Turkey. Even though the Ministry of Agriculture pays 50 % of insurance premium, insurance is not commonly applied yet. Common risks categories threatening crop and animal production in agriculture can be classified as natural, social, economical and political with subtitles, such as the weather conditions, illness, hail damages, wars, public movements, prices, inflation, and changes in factors productivity in the country. Under normal conditions, in developed countries, some precautions are taken to decrease the impact of risks, defined as the losses or decreases in pro-

Zusammenfassung

Das Konzept einer landwirtschaftlichen Versicherung ist ziemlich neu für die Türkei. Daher wurden landwirtschaftliche Versicherungen bisher nur in wenigen Einzelfällen aufgebaut und eine Türkei weite Lösung fehlt. In der Absicht, diese Politik populär zu machen, muss die Sichtweise der Landwirte erkundet werden. Deshalb wurde eine Übersichtsstudie mit Landwirten aus der Provinz Erzurum in der Türkei durchgeführt. Die im Rahmen der gegenständlichen Untersuchung benutzten Daten stammen von diesen Umfragen. Schließlich, um die Bereitschaft der Landwirte zu bestimmen, Agrarversicherungen abzuschließen, werden drei binomiale Probit-Modelle mit begrenzt abhängiger Variable angewendet.

Aus den Ergebnissen ist zu schließen, dass eine Information der Landwirte zusammen mit der Hebung des Bildungsniveaus und einer Verbesserung des Lebensstandards die Akzeptanz einer landwirtschaftlichen Versicherung tendenziell steigern würde.

Schlagnworte: Landwirtschaftliche Versicherung, binomiales Probit Model, Türkei.

Summary

The concept of agricultural insurance in Turkey is quite new. Hence, the implementation of agricultural insurance is very few or none all over Turkey. In order to make this policy widespread and popular, farmers' point of view on agricultural insurance has to be brought out. For this end, a survey study has been conducted with farmers in Erzurum province, Turkey. The data used in this study have been obtained from this survey studies. Finally, to determine the tendency of farmers towards agricultural insurance, Binomial Probit Limited Dependent Variable analysis method has been used for three different models.

From the results, it is concluded that informing farmers, raising their education level and improving their life standards would increase this tendency towards agricultural insurance.

Key words: Agricultural Insurance, Binomial Probit Model, Erzurum, Turkey.

duction, to protect the agriculture sector and to raise the quality of life in rural areas. Agricultural insurance is one of the most important ways to have secure income as well as the most effective way to prevent the harm caused by risk since it has been applied widely in developed countries (ANONYMOUS, 2003).

Like in developed countries, many researchers have conducted research on agriculture insurance in Turkey since 1970s. ERAKTAN (1970), TIMUR (1970), DILMEN (1978), KARAYALCIN (1984), YERLI (1990), BOZ (1993), OZDEMIR, TURVEY and ISLAM (1995), KUSCU (1996), DUNCAN and MYERS (2000), VERCAMMEN (2000), GOODWIN (2001), CHAMBERS and QUIGGIN (2002), and CEYHAN (2003) had done researches on agricultural insurance mainly in order to determine and find the solutions for problems in agricultural insurance application. In these researches, three different approaches such as subjective probability approach, experimental approach, and econometric approach have been developed for solving the problem of applying agricultural insurance.

In this study, econometric approach was chosen as the way to determine solution of the problems in applying agricultural insurance.

2 Materials and methods

The data were collected by interviews and applied questionnaire to family leaders in Tuzcu, Tepekoy, Borekli, Kumbet, Guzelyurt, Derebogazi, Yagmurcuk, Sogucak, Cayırtepe, Dumlu, Yolgeci, Yesilyayla, Umudum, Uzunahmet, Ciftlik, and Uzunyayla villages located in the center district of Erzurum. The surveys in, parallel with the purpose of the research, were composed of four parts. The first part included the questions about the general characteristics of the village, the second part was about characteristics of the farmers, the third was about application of agriculture insurance, and the last part was about the structure of farms.

16 research villages in Erzurum were selected by Non-Random Sampling Method by taking into consideration their total agricultural land estate. The number of surveys was determined as 150 by Simple Random Sampling. By these surveys, data about the level of farmers' knowledge about 'agricultural insurance' and the data about the implementation of 'agricultural insurance' within research area were collected; those parameters were coded in computer by Microsoft Excel package program; the necessary statistics are calculated by Crosstab method in Limdep Econometric

Computer Program, to determine the factors affecting the farmers' acceptance of agricultural insurance. Probit Limited Dependent Variable econometric models were used in order to estimate significant factors or variables.

In former studies, Limited Dependent Variable Regression Models were used to identify dependent variable. Dependent variable showing two conditions indicates the probability of existing and not, existing of an event. In the case that an event happens, dependent variable becomes '1', if it does not, it becomes '0' (YAVUZ, 2001; GUJARATI, 1995).

Three methods were applied for estimation of such models. These models were Linear Probability Model, Logit Model, and Probit Model. In Linear Probability Model, the estimated probability may fall out of the 0–1 interval, while it is reliable that those in Probit and Logit fall between these intervals. Since Logit and Probit are similar models, it was up to the researcher which one of two models to use (GUJARATI, 1995; SARIMESELI, 2000). Binomial Probit Model was chosen for this study.

This study attempts to determine whether a tendency towards 'agricultural insurance' exists. Dependent variables were the situation of having one of the existing social security insurances (Bag-Kur, Social Insurance Institution, Pension Fund), being aware of agricultural insurance, and willingness of acquiring knowledge about agricultural insurance. The functional form of regression models that estimate the effects of factors determining the tendency of farmers towards social security and 'agricultural insurance' were as below:

Model 1.

$$dg = f(ku, cy, cg, ks)$$

dg: whether the farmers have social security (dummy),

ku: distances of the villages to centre town,

cy: age of farmers,

cg: net monthly income of farmers,

ks: the number of people in the family.

Model 2.

$$ts = f(ku, cy, cg, ks, sa, tg)$$

ts: whether the farmers have knowledge of agricultural insurance(dummy),

ku: distances of the villages to centre town,

cy: age of farmers,

cg: net monthly income of farmers,

ks: the number of people in the family,

sa: amount of farmers' own lands,

tg: total income obtained from agriculture.

Model 3.

$$tse = f(hs, ce, gt, sa, ss)$$

- tse*: whether the farmers want to get educated on agricultural insurance (dummy),
- hs*: number of houses in the villages,
- ce*: education levels of the farmers,
- gt*: whether all income was provided from agriculture (dummy),
- sa*: amount of farmers' own lands,
- ss*: number of farmers' own cattle.

3 Results and discussion

3.1 Attitudes of farmers towards agricultural insurance

In the villages 6–10 km away from the centre of town, 68% of farmers have social security, 67 % of them have knowledge about existence of agricultural insurance. For the villages having more than 10 km distance, farmers have less tendency towards agricultural insurance (Table 1).

As the age of farmers increases, their demands for social security rise depending on their experience (Table 2). Demands of social security for farmers aged between 20–59

rise continuously. 50 % of farmers in between the ages 50 and 59 have social security, while this percentage falls to 38 % for those at the age of 60 or above. However, demand for social security decreases for farmers, who were above the age of 60 and actively gave up the agricultural activities and the percentage of having social security falls to 38 %. 30 % of farmers in the farms where survey was applied told that they had knowledge of agricultural insurance. 23 % of farmers aging between 50 and 59 and 40 % of those aging between 20 and 29 told that they had knowledge of agricultural insurance. As the age of farmers increases, the tendency of farmers having knowledge on agricultural insurance was decreases in the age of producers within 20 and 29.

By concerning income levels, 6 % of farmers whose average monthly income was less than 99 Dollars have social security. 71 % of those earning between 400 and 499 Dollars have social security (Table 3). As the income of farmers increases, demand for social security increases, too. 72 % of producers whose income was more than 500 Dollars stated that they had knowledge of agricultural insurance. As the income of farmers increases, their tendency towards agricultural insurance increases, too.

Only 14 % of the farmers providing their whole income from agriculture said 'no' to the question of "would you like to get educated on agricultural insurance?" whereas 86 %

Table 1: The effect of distance between the village and the center of town on holding social security and knowledge about agricultural insurance (%)
Tabelle 1: Auswirkung der Entfernung zwischen Dorf und Stadtzentrum auf den Besitz einer Sozialversicherung und die Kenntnis über landwirtschaftliche Versicherung (%)

| | The distance of the village from the town (km) | | | | | |
|--|--|------|-------|-------|------|---------|
| | 0–5 | 6–10 | 11–15 | 16–20 | 21 < | Average |
| Holding social security | 40 | 68 | 17 | 31 | 21 | 35 |
| Knowledgeable about agricultural insurance | 47 | 67 | 33 | 25 | 21 | 38 |

Table 2: Distribution of the farmers holding social security and knowledge on agricultural insurance within age groups (%)
Tabelle 2: Verteilung von Landwirten mit dem Besitz einer Sozialversicherung bzw. mit Kenntnissen über landwirtschaftliche Versicherungen auf unterschiedliche Altersgruppen

| | Age group | | | | | |
|------------------------------------|-----------|-------|-------|-------|------|---------|
| | 20–29 | 30–39 | 40–49 | 50–59 | 60 < | Average |
| Holding social security | 17 | 33 | 41 | 50 | 38 | 36 |
| Knowledgeable about farm insurance | 40 | 24 | 33 | 23 | 29 | 30 |

Table 3: Distribution of the farmers holding social security and knowledge on agricultural insurance by annual income (%)
Tabelle 3: Verteilung von Landwirten mit dem Besitz einer Sozialversicherung bzw. mit Kenntnissen über landwirtschaftliche Versicherungen auf unterschiedliche Einkommensgruppen

| | Income (US Dollars) | | | | | | |
|--|---------------------|---------|---------|---------|---------|-------|---------|
| | 0–99 | 100–199 | 200–299 | 300–399 | 400–499 | 500 < | Average |
| Holding social security | 6 | 18 | 30 | 64 | 71 | 71 | 43 |
| Knowledgeable about agricultural insurance | 6 | 16 | 30 | 37 | 71 | 72 | 39 |

answered ‘yes’. In short, those earning their whole income from agriculture have more willingness to get informed about agricultural insurance. In order to guarantee their income and future and their tendency towards this subject increase.

3.2 Findings derived from regression analysis

To determine the factors affecting the case whether farmers have social security, whether they have knowledge of agricultural insurance, and whether they want to get educated on this subject, Binomial Probit estimation procedure in Limdep computer package program was applied. Three linear dependent variable models were estimated (Table 4).

3.3 Factors affecting farmers to have social security

Factors affecting whether farmers have social security and statistical summaries of these factors are given in Table 5. The signs of all parameters obtained from the model were reasonable, only the age of the farmer was determined to be statistically insignificant.

The distance of village to town has negative effect on the decision of farmers to have social security. It means that as the distance of a village to town increases, the number of farmers having social security decreases. As villages have longer distance to centre town, the number of farmers visiting town declines, so they don’t realize the importance of opportunities to be utilized.

There exists a positive relation between the farmers’ approaches and their ages. As their age average increases,

their interest in social security increases because of their previous experiences.

A positive relation is estimated between the income of the farmer and having social security. As income of the farmer increases, so does the power to pay individual insurance premium. It is normal for a farmer with increasing income to save his future and have insurance. If starvation limit is accepted as 316 Dollars¹ in Turkey (ANONYMOUS, 2004a), the case of having social security for 64 % of producers who earn monthly net income between 300 and 399 Dollars increases the tendency towards agricultural insurance.

An inverse relation was found between the numbers of people the farmer is responsible for and having social security. Having bigger family size raises the expenditures. Thus, affording the individual insurance premiums will be harder. In conclusion, as the expenditure of the farmer increases, his opportunity to have social security decreases.

3.4 Factors affecting knowledge of farmers on agricultural insurance

Factors affecting whether farmers have the knowledge of agricultural insurance and statistical summaries of these factors are given in Table 6. The signs of all parameters are reasonable, while the age of the farmer, family size, amount of land he owns and total income acquired from agriculture are estimated statistically insignificant.

The distance of the village to the town has negative effect on knowledge of farmers on agricultural insurance. As the distance between village and town increases, the number of farmers having knowledge on agricultural insurance decreases.

Table 4: Distribution of willingness of farmers to receive education on agricultural insurance by the source of total income (%)

Tabelle 4: Verteilung der Bereitschaft von Landwirten zur Weiterbildung über landwirtschaftliche Versicherungen auf unterschiedliche Einkommensquellen (%)

| Willingness to receive education on Agricultural insurance | Those providing their whole income from agriculture | | |
|--|---|-----|---------|
| | No | Yes | Average |
| No | 26 | 14 | 20 |
| Yes | 74 | 86 | 80 |
| Total | 100 | 100 | 100 |

Table 5: Factors affecting farmers to have social security

Tabelle 5: Einflussfaktoren für den Besitz einer Sozialversicherung

| | Coefficient | St. error | t-ratio | p-value | Elasticity |
|-----------|-------------|-----------|---------|---------|------------|
| <i>ku</i> | -0,0558 | 0,0130 | -4,2910 | 0,0000 | 16,1067 |
| <i>cy</i> | 0,0093 | 0,0066 | 1,4080 | 0,1591 | 42,8333 |
| <i>cg</i> | 0,0022 | 0,0005 | 4,8250 | 0,0000 | 388,2667 |
| <i>ks</i> | -0,1148 | 0,0427 | -2,6870 | 0,0072 | 6,7133 |

Table 6: Factors affecting farmers' knowledge on agricultural insurance

Tabelle 6: Einflussfaktoren auf die Kenntnis über landwirtschaftliche Versicherungen

| | Coefficient | St. error | t-ratio | p-value | Elasticity |
|-----------|-------------|-----------|---------|---------|------------|
| <i>ku</i> | -0,0256 | 0,0127 | -2,0130 | 0,0441 | 16,1067 |
| <i>cy</i> | -0,0121 | 0,0069 | -1,7500 | 0,0802 | 42,8333 |
| <i>cg</i> | 0,0016 | 0,0005 | 3,5850 | 0,0003 | 388,2667 |
| <i>ks</i> | -0,0744 | 0,0465 | -1,5990 | 0,1099 | 6,7133 |
| <i>sa</i> | -0,0015 | 0,0015 | -1,0260 | 0,3047 | 78,0700 |
| <i>tg</i> | 0,0004 | 0,0000 | 1,6530 | 0,0983 | 6524,2000 |

Table 7: Factors affecting the willingness of farmers to receive education on agricultural insurance

Tabelle 7: Einflussfaktoren für die Bereitschaft zur Weiterbildung über landwirtschaftliche Versicherungen

| | Coefficient | St. error | t-ratio | p-value | Elasticity |
|-----------|-------------|-----------|---------|---------|------------|
| <i>hs</i> | -0,0009 | 0,0008 | -1,2190 | 0,2227 | 160,7533 |
| <i>ce</i> | 0,2104 | 0,0775 | 2,7160 | 0,0066 | 3,3067 |
| <i>gt</i> | 0,5600 | 0,2345 | 2,3880 | 0,0170 | 0,7133 |
| <i>sa</i> | 0,0028 | 0,0020 | 1,3870 | 0,1653 | 78,0700 |
| <i>ss</i> | -0,0108 | 0,0094 | -1,1400 | 0,2544 | 14,5867 |

Knowledge of farmers on agricultural insurance is inversely related to the age of the farmer. As the age of farmers increases, the tendency towards agricultural insurance decreases. It was found that the younger the farmers are the more tendency they have towards agricultural insurance.

The more income farmers have, the more knowledge on agricultural insurance they get. Among the participants, 72 % of those having income of 500 dollars or more stated that they had knowledge of agricultural insurance. If the poverty limit is accepted as 961 Dollars (ANONYMOUS, 2004b), it is obvious that this proportion is very high. When we look at the values of variables, it is found that income of farmers is more effective when compared with other factors.

There is inverse relation between knowledge of farmers on agricultural insurance and the number of people in family. As the number of people in family increases, the number of those having knowledge on agricultural insurance decreases. Having bigger family size increases the expenditures of the farmer and so the tendency towards purchasing agricultural insurance decreases.

There is a negative relation between the dependent variable and the amount of land owned. It means that as amount of land owned increases, the number of farmers having knowledge of agricultural insurance decreases. Producers with 200 ha and more land think that they would finance themselves in case of any loss due to hail, freeze and fire, and their tendency towards agricultural insurance diminishes.

Results show that there is a positive relation between having knowledge on agricultural insurance and the total income earned from agriculture. The higher the total

income earned from agriculture, the more the tendency the farmers have to demand knowledge on agricultural insurance. Producers having such high income seek for an easier way of meeting natural, social and economic risks, and their tendencies towards agricultural insurance increase.

3.5 Factors affecting the willingness of farmers to receive education on agricultural insurance

Factors affecting producers to get education on agricultural insurance and statistical summaries belong to these factors are given in Table 7. The signs of all parameters obtained from the model are reasonable while the number of houses in village, amount of land owned and the number of oxen are statistically insignificant.

There exists an inverse relation between the farmer's willingness to have education on the agricultural insurance and the number of houses in village. Namely, as the number of houses in the village increases, the number of farmers willing to take education on agricultural insurance decreases. As the number of houses in village increases, the interdependence and cooperation will increase and thus the tendency towards agricultural insurance will decrease.

There is a positive relation between the dependent variable and the education level of farmer. It means that as the education level of farmer increases, the number of farmers who want to receive education on agricultural insurance increases.

There is a positive relation between the farmer's willingness to receive education on agricultural insurance and pro-

viding all of their income from agriculture. It means as the number of those providing all of their income from agriculture rises, the number of those willing to take education on agricultural insurance increases. Producers would give more importance to agricultural insurance in order to keep their income at some level and guarantee the future of their plants.

There is a positive relation between dependent variable and the amount of land owned. It means that as the amount of land owned increases, the number of producers willing to have education on agricultural insurance increases, too. When the amount of farmers' own land increases, their output and thus the income earned from crops were increased. Producers would turn to agricultural insurance in order to prevent fluctuations in their income.

An inverse relation was found between the farmer's willingness to get educated on agricultural insurance and the number of cattle he owns. Namely, as the number of cattle the farmer has increases, the number of the farmer's willingness to get educated decreases. Farmers' tendencies towards agricultural insurance decline when they have enough number of cattle that can guarantee their future income and make them feel confidently.

4 Conclusions

The fact that only one person had agricultural insurance among the farmers that were included in the survey in the villages of Erzurum, indicates the lack of expected efficiency in the region. This stems from various problems in both agriculture and insurance sector. The main problems stemming from insurance sector were lack of net worth, insufficiency of capacity, difficulties in maintenance of reinsurance, technical insufficiencies and shortfall of educated personnel. Those sources from agriculture sector are the various qualities of risks threatening agriculture, farmers' insufficient financial power to pay the premium of agricultural insurance, small, fragmented and disorganized agricultural land, the high level of insurance premium per capita, the low level of social, cultural and educational standards in agriculture section, and farmers' conservative and fatalist approaches. In addition, lack of state support in insurance and agriculture sectors is an important problem.

Since the agricultural land in the research area was small, fragmented and disorganized, insurance premium per capita is high. In order to decrease insurance premium to the level where producers can afford to pay, consolidation of land should be conducted. In order to increase the knowl-

edge of farmers in the region, social security and agricultural insurance seminars should be given periodically. According to the results of the study, as the education level and income of farmers increase, the tendency towards agricultural insurance increases, as well. Depending on this, necessary precautions should be taken to increase the education level and income of farmers in the region. Having low level of numbers of farmers visiting the town decreases the tendency towards agricultural insurance. Thus, essential cautions should be taken to increase the number of farmers visiting provincial center in the region.

Note

¹ One US Dollar was about approximately 1500 000 Turkish Liras in 2004.

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