University Ss. Cyril and Methodius in Skopje
Faculty of Agricultural Sciences and Food

SYMPOSIUM PROCEEDINGS

2nd International Symposium for Agriculture and Food

7-9 October 2015, Ohrid, Republic of Macedonia

VI INTERNATIONAL SYMPOSIUM OF LIVESTOCK BREEDING
X INTERNATIONAL CONFERENCE OF ASSOCIATION OF AGRICULTURAL ECONOMISTS OF REPUBLIC OF MACEDONIA
VIII SYMPOSIUM FOR VEGETABLE AND FLOWER PRODUCTION
V SYMPOSIUM OF VITICULTURE AND WINE PRODUCTION
XXXVIII FACULTY-ECONOMY MEETING

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CONTENT

SECTION 2.
AGRICULTURAL ECONOMICS

CONTENT

BEHAVIORAL FACTORS INFLUENCING THE USE OF RURAL DEVELOPMENT SUPPORT

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Abstract
Rural development (RD) policy is essential for sustainable development and continuous improvement of the quality of life of rural people. Despite the relative importance of RD policy, its implementation is lagging behind the direct payments support, partly because of the farmers' unengaged interest. The aim of this paper is to identify the key behavioral factors that influence farmers' intention to apply for RD support. The analytical framework is based on the theory of planned behavior, where the individual intention to perform a given behavior (apply for RD support) determines the performance and is shaped by the individual attitudes, social support and the perceived behavioral control; and a structural equation model. The survey took place in November-December 2014, in face-to-face interviews covering 299 farm households in Macedonia. Farmers with more positive attitude and perceived behavioral controls have stronger intention to use the RD support available. The model explains two-thirds of the variance. This knowledge provides basis for designing interventions to maximize farmers' use of available rural development funds.
Key words: Rural development support, Macedonia, Theory of planned behavior, Structural Equation Model

Introduction

The ongoing trend of abandoning rural areas and insufficient use of the land resources is a challenge for the policy makers. Rural development (RD) policy strives to solve these and other rural areas' issues, such as agricultural competitiveness, diversification of employment opportunities, and thus mitigate the poverty and improve the quality of life in rural areas.

Rural areas accommodate nearly half of the population in Macedonia (43% in 2010-2014, WBDa, www). The unfavorable educational structure, poor qualifications and lack of skills of farmers, as core constituent of the rural economy, limit the entrepreneurial potential in the rural areas. The rural economy growth is also constrained by insufficient investments in public goods and services, weak physical infrastructure, limited access to markets and to sources of finance, undeveloped information systems, knowledge and technology transfer. The development of rural areas is additionally hindered by.

Agriculture is the key contributor to rural economy and source of employment in rural areas. The share of agriculture, forestry and fishing in national gross value added is

around ten percent, whereas employment in this sector is 17 percent of total employment in Macedonia (WBDb, www). Small scale and fragmented family farming is typical, with an average farm size of 1.9 hectares (SSO, 2014). The sector shows low factor productivity, mostly due to slow process of farm consolidation, inefficient use of production factors, and slow restructuring of other sectors. It serves as social buffer for the unemployed population that find shelter within family holdings and semi-subsistence agriculture.

Macedonia aspires to join the European Union, and as candidate country since 2005 is committed to reforms and necessary adjustments towards the Common Agricultural Policy (CAP). The rural development policy is harmonized with the CAP, adopting its conceptual, administrative and financial model. However, agricultural policy is still oriented toward production support, while structural and rural development support receives lower priority. The total budgetary support in agriculture and rural development is very low (148 Euro/ha UAA in Macedonia, one third compared to the support in EU-27) (Volk, Rednak, and Erjavec, 2014); whereas the funds for structural and rural development measures are at much lower level (25 Euro/ha or comparatively at about 10%-level of the EU average) (Dimitrievski et al. 2014). In terms of implementation, among the structural and rural development measures dominate the investment support measures for improving the competitiveness of agriculture. The other measures, such as those supporting agri-environmental issues and rural economy, receive lower attention. Additional support is available through the EU pre-accession instrument for rural development (IPARD), but an extremely low rate of absorption is evident in the previous years (16.3%) (IPARD Monitoring Committee, 2015). The low and unstable level of budgetary support insufficiently addresses most issues hampering rural development (technological backwardness, rural poverty, environmental problems and unfavorable social structures in rural areas).

Despite the relative importance of RD policy, its implementation is far behind the direct payments support, partly because of the farmers' interest for this support. The level of preparedness of farmers affects the rate of utilization of RD support. Farmers face obstacles in accessing these funds, partly from the individual lack of abilities and motivation to deal with the complex rules and procedures, emphasized by existing weaknesses in administrational and institutional capacities. The rural development issues, the policy challenges and the absorption capacity of farmers as main beneficiaries, prompt the need to understand and explain the factors which influence farmers' decisions on rural development support use. In this respect, the aim of this paper is to identify the key behavioral factors that influence farmers' intention to apply for RD support. The behavior of interest in this research is an application to RD support for personal benefit (own household) or public benefit (infrastructural improvements, renewal of the villages, rural tourism etc.) in short- (next year) and mid-term (next 3-5 years) perspective.

The behavioral approach is often used in agricultural and rural studies investigating farmers' response to policy initiatives (Burton, 2004). Besides profit maximization, farmers' behaviors are also influenced by a range of socio-economic and psychological factors (extensive list provided in Willock et al., 1999). Understanding the motivation of farmers, given adequate information on resources and constraints, fairly explains and predicts farmers' behavior (Gasson, 1973). The theory of planned behavior (TPB) (Ajzen, 1991) is the most common model for understanding, predicting, and possibly changing human behavior (Webb and Sheeren, 2006). This theory is highly applicable to agricultural

research (Jackson et al., 2006) and has been applied in studies related to farmers' behavior in agricultural policy context (Garforth and Rehman, 2006; Gorton et al., 2008; Dos Santos et al., 2010; Emery and Franks, 2012) and farm decision-making and management (Willock et al., 1999; Bergevoet et al., 2004; Fielding et al., 2005; Artikov et al., 2006).

TPB suggests that the behavior is guided by the intention to perform the behavior in question, i.e. intentions indicate the degree of effort the individual is willing or planning to put forth in order to perform the behavior. TPB assumes three independent predictors of intention (Ajzen, 1985, 1991, 2012): (1) the attitude toward the behavior as its' positive or negative evaluation; (2) the subjective norm in terms of the perceived social pressure whether to perform the behavior; (3) the perceived behavioral control or the individual assessment of the level of complexity to perform the behavior. The more positive the attitude, subjective norm and perceived behavioral control, the stronger is the intention to engage in a behavior, and the greater the likelihood of the performance of the behavior (Ajzen, 1991). Given the availability and accessibility of the required opportunities and resources, as well as the intention to perform the behavior, the individual should eventually succeed in performing the behavior.

To fulfill the research aim, a structural equation model is built using data collected in a survey in Macedonia, carried out in November-December 2014. The research was carried out in the framework of the regional research project "The impact of socio-economic structure of rural population on success of rural development policy". The findings provide basis for recommendations for policy makers, extension agents and advisors to improve their approach when addressing the farmers and stimulate their participation in RD programs.

After the introduction, we present the methodological framework and data collection procedure. The results of the survey along with the measurement and structural equation model are then presented. The discussion and concluding remarks are provided at the end.

Materials and methods

The questionnaire was designed to obtain measures of the TPB constructs. Eliciting accessible beliefs was done first by using open-ended questions to agricultural experts, supplemented with modal accessible beliefs from the literature review, which were additionally simplified after testing the questionnaire with farmers. The statements are assessed on a 5-point disagree-agree scale, or a Likert-scale given in semantic differentiate format, ranging from 1 (worst evaluation) to 5 (best evaluation).

The survey took place in November-December 2014 in face-to-face interviews in two regions in Macedonia, Strumica and Bitola, ultimately gathering 299 filled questionnaires. During the survey, 46 farmers declined to participate in the survey due to various reasons ("I'm busy", "I don't have time for surveys", "I do not what to share personal information", "I do not what to have problems with the ministry later", etc.). The few missing values in the dataset were imputed using the maximum likelihood method with expectation–maximization (EM) algorithm, suggested as an advantageous approach to traditional techniques (Baraldi and Enders, 2010).

Following the descriptive statistics to profile the sample and the general response, a structural equation modeling (SEM) approach was used to analyze the farmer's intention to apply for RD support.

SEM is a robust analytical tool for studying complex relationships as it combines two multivariate techniques (factor analysis and multiple regression analysis). Covariance matrices are used to assess the model fit hence providing flexibility and relatively greater information content (Hair et al., 2006). Two-step SEM modeling procedure is carried out by specifying first the measurement model (using SPSS, version 20) and then the structural model (using AMOS, version 21). The measurement model, as confirmatory factor analysis representing how the measured variables come together to form the latent constructs, serves as a basis for assessing the fit and validity of the structural theory. In the structural model, representing how the constructs are associated with each other, the analysis focuses on the hypothesized relationships between the latent constructs.

Figure 1 illustrates the relationships of the factor, following TPB: positive attitudes, subjective norms, and perceived behavioral controls enhance the behavioral intention of using RD support. In our study, we delimit the analysis to the point of explaining the behavioral intention to apply to RD support, since strong intention to engage in certain behavior is generally a strong indicator of its ultimate performance (as reported in Sheeran's (2002) meta-analysis, the weighted average correlation of the intention-behavior relationship is 0.53).
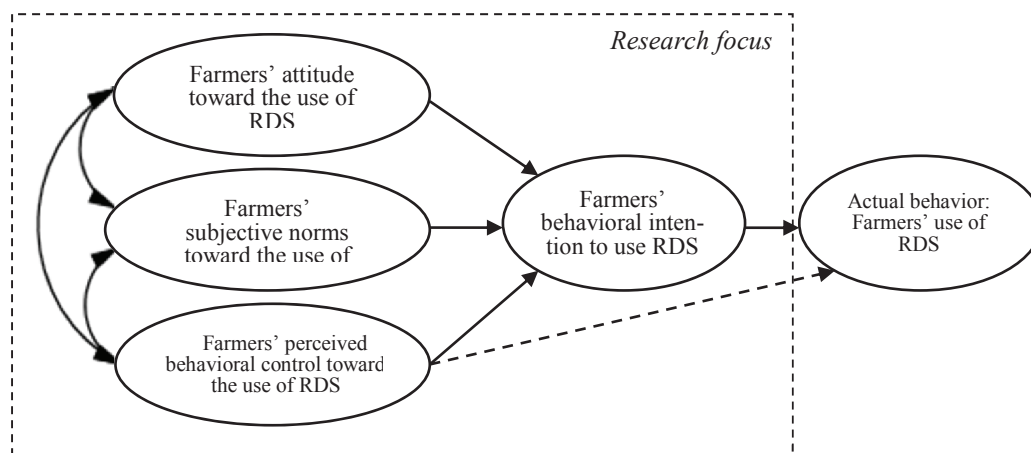

Figure 1. Theoretical concept of the interrelations between behavioral factors and intention (adapted from Ajzen, 1991)

In the model specification, ten variables were retained to explain the interrelations between the farmer's behavioral determinants: two intentions, three statements measuring farmers' attitudes, two subjective norms and three perceived behavioral control (as shown in Table 1).

In the specified model, the behavioral determinants (ATT, SN and PBC) are set as exogenous multi-item latent constructs, while the behavioral intention to apply to RD support (BI) is the endogenous multi-item latent construct variable. Correlation is allowed between the three separate elements of farmer's behavior, given that the inter-construct relationships can increase the reliability of the dependence relationship estimates (Hair et al., 2006).

Results

Farmer's profile

Most of the farmers are with low level of education (in average 10 years of formal education), but with long experience in farming (see Table 1 for detailed sample profile). The average age of respondents is 47, and the average experience in farming is 26 years. Over 90% of the household income comes from farming, indicating that farmers depend almost exclusively on agriculture. Most of the farmers are commercially oriented (the respondents reported that 96% of the production is sold on market). Although expressing very strong intention to stay in farming and in the rural areas (mean 4.6, towards strongly agree), most farmers do not know who will take over their farm and continue the farming activity. Macedonian farmers are familiar with RD support (mean 4.3); around 25% of the respondents applied for some kind of RD support with 65% success rate and average amount of 5,600 Euros per farmer.

The general attitude toward RD support is positive; over 90% of farmers declare that it is good for the state to have RD support (mean 4.6). Farmers express generally positive intention to apply for RD support both in short-term and mid-term perspective (mean 3.4 and 3.5, respectively, see Tab. 1). Farmers found that the principle of co-finance in RD projects is good motivator for farmers (mean 3.7). Macedonian farmers value the approval from family to use RD support (mean 4.1). The opinions of other people they respect are also influential, but expectedly to somewhat lesser extent (mean 3.6). The response on the statement whether many people they know pursues them to apply for RD support calls is rather neutral (mean 3.2). The personal ability of the farmer is generally assessed as an obstacle. Macedonian farmer's perception of lack of experience and knowledge to independently prepare the application has been confirmed in previous research (Kotevska et al., 2013). The access and cost of RD support application (information, procedure and documents) is perceived as an additional external barrier. Regarding the personal ability, they are not self-confident (mean 2.1), and responded mostly negative to the statement whether they have enough own means to co-finance an RDP investment.

Table 1. Profile of the farmer's sample, RD support and TPB statements (mean ± st.dev)

Sample characteristics	
Number of farmers in the sample	299
Age (years)	46.45±12.23
Work in farming (years)	25.56±12.37
Formal education (years)	10.10±2.86
Share of production sold on market (%)	96.31
Share of income coming from farming (%)	90.35
Likeliness to stay in farming (S1)	4.56±0.84
Identified successor (S1)	2.92±1.45
Intention for investment (S2)	3.48 ±1.40
RD support	
Familiarity with RD support (S3)	4.33±0.73
Farmers' opinion: it is good state has a RD support (S3)	4.56±0.60
Farmers that applied for RD support (%)	25.08
Farmers that received RD support (%)	16.39
Success rate (applied/received, %)	65.33
Received RD support per farmer (Euros)	5,63±2,50
Farmers' intention to use RD support	
BI1: Intention to apply for RD next calls (S3)	3.44±1.13
BI2: Intention to use RD for own household next 3-5 yrs (S2)	3.46±1.09
Farmers' attitude	
ATT1: RD increases income of farms and rural households (S3)	3.98±0.91
ATT2: RD supports survival of small family farms (S3)	4.03±0.92
ATT3: The co-financing in RD projects is good motivator for farmers (S3)	3.73±1.10
Farmers' subjective norm	
SN1: Other people approve application for RDS (S3)	3.59±0.99
SN2: Many people I know pursues me to apply for the RDP call (S3)	3.18±1.15
Farmers' perceived behavioral control	
PBC1: Enough information to apply (S3)	2.18±1.02
PBC2: Knowledge/experience to prepare application (S3)	2.07±1.04
PBC3: I have enough own means to co-finance an RDP investment (S3)	2.62±1.27

Scales: S1 (1-definitely not; 5-definitely yes), S2 (1-very weak; 5-very strong), S3 (1-strongly disagree; 5-strongly agree).

The measurement model
The measurement model specified herewith is based on TPB and distinguishes four groups of latent factors: attitude toward the behavior (ATT), subjective norm (SN), perceived behavioral control (PBC) and behavioral intention (BI) (Table 1). In the confirmatory factor analysis, the constructs are assumed as correlated, but not dependent upon another. The measurement model fits and displays overall construct validity, which facilitates the assessment of the connection between the theoretical latent construct and the measurable observed variables i.e. the measures consistently represent the same latent factor. The factor loadings are statistically significant and standardized loading estimates are higher than the minimum threshold of 0.5 in all cases. As shown in Tab. 2, the composite reliability (CR) indicator has values of 0.7 or higher, suggesting good reliability, and the average variance explained (AVE) is over the recommended value of 0.5, suggesting adequate convergence since more than half of the variance is explained by the latent factor

structure (as recommended in Hair et al., 2006). The discriminant validity is also acceptable, since the observed variables fit best in the given parent latent construct. In all cases, the variance extracted score is greater than the squared correlation coefficients among the variables and less than one the absolute value of the correlations with another factor.

Table 2. Indicators of internal consistency and validity (n = 295)

	CR	AVE	MSV	ASV	SN	PBC	ATT	BI
SN	0.843	0.734	0.158	0.070	0.857			
PBC	0.832	0.629	0.040	0.025	0.200	0.793		
ATT	0.769	0.528	0.516	0.233	0.398	-0.160	0.727	
BI	0.806	0.676	0.516	0.180	0.113	0.102	0.718	0.822

Note: CR (Composite reliability), AVE (Average Variance Extracted), MSV (Maximum Shared Variance), ASV (Average Shared Variance).

The structural model
Structural equation model is build upon the measurement model in order to verify the impact of behavioral factors on the farmers' intention to use RD support (see Fig. 2). In the specified structural model, based on TPB, the behavioral determinants (ATT, SN and PBC) are set as exogenous constructs and the behavioral intention to apply to RD support (BI) is the endogenous construct. The correlation is freed between ATT, SN and PBC. Following the modification indices, we further opened the correlation among ATT1, ATT2 and ATT3, respectively and also between PBC1 and PBC2.

The fitness of the model was tested and the model is acceptable based on standard model-fit indicators. The overall model chi-square (χ^2) is with value of 54 and 26 degrees of freedom, i.e. the χ^2/df ratio is 2.08. It is however statistically significant, but this is expected since this statistical test and p-value is less meaningful as sample sizes become larger (Hair et al., 2006). Therefore, other supplementary fit statistics were run and all indicated good model fit (as suggested in Hu and Bentler, 1999): comparative fit index = 0.98; population root mean square error of approximation = 0.06, with two-sided 90% confidence interval ranging between 0.04 and 0.08; standardized root mean residual of 0.06.
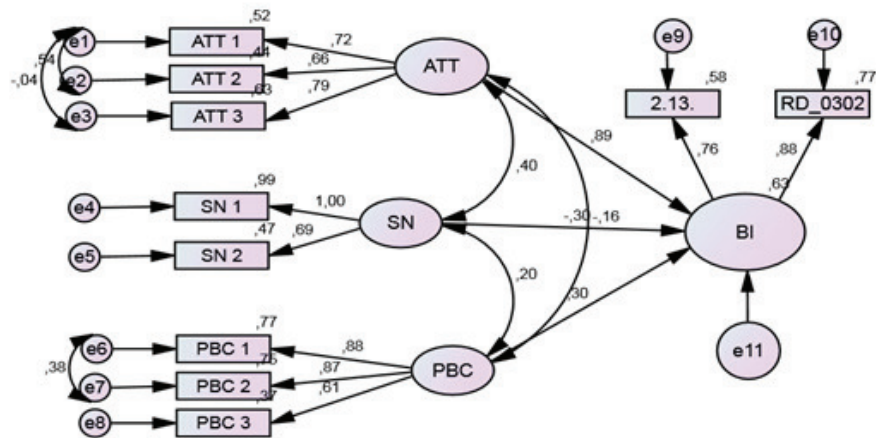
Figure 2. Structural equation model, standardized estimates

The SEM is illustrated in Figure 2; the paths in the model corresponding to the TPB framework. All paths and relations are statistically significant. The more positive attitude and perceptive behavioral control, the stronger behavioral intention to use the available RD support. These three exogenous constructs explain approximately two-thirds of the variance on behavioral intention (squared multiple correlation of the endogenous latent behavioral intention construct: 0.63). The impact of the farmers' attitude whether to apply for RD support has highly positive standardized coefficient (ATT to BI path standardized estimates: 0.886, p-value 0.000). The impact of perceived behavioral control is statistically significant hence confirming that it positively influences the intention to apply (PBC to BI path standardized estimates: 0.304, p-value 0.000). The subjective norms are statistically significantly influencing the intention to apply, but in a negative direction (SN to BI path standardized estimates: MK -0.300, p-value 0.000). In a different model specification, when including a family support variable in the subjective norm latent construct, the statistical significance and even the effect becomes borderline positive but with no statistical significance. Taking into account the importance of family support for Macedonian farmers, it is advisable to have that aspect within the subjective norm construct. This finding signals for deeper investigation of this issue.

Discussion and conclusions

The success of RD policy strongly depends upon the intention and ultimately the actual behavior of farmers in using RD funds. Following the TPB, intention is a function of farmers' beliefs related to RD program. Farmers in the survey with more positive attitude and more perceptive behavioral control have stronger behavioral intention to use the RD support available.

The positive attitude toward RD support strongly pronounced by farmers in Macedonia can be used when building RD policy strategies to increase the absorption of available support. The farmers mostly recognize the benefits affecting their individual farm household (e.g., income increase, farm survival). However, RD policy measures need to

also focus on common benefits that would improve the overall quality of life in rural areas and hence offer opportunities to farmers to participate in such joint projects.

Farmers perceived control over the process and self-confidence increases their intention to apply and is statistically significant. The better the abilities of the farmers, their control over information, knowledge and experience to independently prepare the RD support application, the higher the intention to request RD support. The procedure and rules for accessing RD support need to be simplified, more accessible and applicable with intensified extension support. Appropriately defined guidance and trainings can contribute to boosting farmer's self-confidence. Easier access to credit would additionally advance the use of RD support since the ability and preparedness to co-finance investments is an important factor.

Although the support from family is particularly important, this construct is not completely explained by the model. Further investigation of this issue and improved approach when eliciting beliefs from the target population can contribute to better understand and predicts this TPB component. The literature suggests that the subjective norm construct is generally a weaker predictor of intentions and behavior. Armitage and Conner (2001) argue that this occurs partly due to poor measurement and methodological approach as well as the need for expansion of the normative component. In agricultural related studies, the phenomena of social norm can be to some extent explained by the importance of independence to farmers (Gasson, 1973), making it understandable that farmers would not be very willing to declare in a survey that they are under social influence by the respected others (Burton, 2004). TPB proved to be an adequate tool for supporting policy analysis. The structural equation model measuring the influence of behavioral factors on intention and their interrelations gives an additional value. The application of these findings, as well as the methodological approach, in policy design and intervention can contribute to the effective use of the rural development funds.

Acknowledgements

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