SUPPORT AND VIABILITY ISSUES: LITHUANIAN FARMERS' VERDICT

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Abstract
One of the most challenging issues of EU agriculture is viability of farmers' and family farms. These farms used to play a major role in new member states. However, the last decades are characterized by the significant decrease in the number of farmers' farms. The paper deals with the issues of these farms' viability and the role of support. A literature review on viability concept and indicators justify the selection of socio-economic viability criteria for the survey. The findings are based on the results of Lithuanian farmers' opinion survey. The analysis of the selected socio-economic criteria of viability shows that crop production farms are characterized as the most viable. According to the survey results, the farms with less than 30 ha, and the farms operated by farmers aged 60 and older belong to the most vulnerable group. These farms are non-viable in the long-run. The risk estimation of staying in agricultural business if support is abolished for viable and non-viable farms shows dependence of farm's behaviour and viability status.
Key words: support, viability, farm, agricultural policy.

Introduction

Regulations of Common Agricultural Policy (CAP) have been underlining the relevance of farm viability issues for the last decades. The main efforts were directed towards measures of economic viability. This policy is being criticized for the significant impact of the support (particularly direct payments) on the structural changes of agriculture. The loss of the EU agriculture diversity and new environmental concerns are often mentioned as key long-term effects of excessive attention to economic issues. Some researchers declare that agricultural production has become dependent on support. However, selected measures to secure economic viability were inefficient solving one of the most important problems of the long-run viability in agriculture – generational renewal. Young generation recognizes other economic sectors as a more attractive career choice.

This situation encouraged research on farm viability issues around the world. However, the common definition of farm viability and the determination of complete viability threshold remain an open question. It empowers a deeper analysis of different viability aspects and the role of farmers' support is one of the most challenging topics. The performed studies analyse the impact of direct payment abolition on viability of agriculture (Vrolijk et al., 2010; Agrosynergie, 2011; Coppola et al., 2013), propose to include indicators reflecting the role of support into the set of viability criteria (Dillon et al., 2008; Dillon et al., 2009; Dillon et al., 2010; Scott, 2001) or define different levels of viability including/excluding various types of support (Fritzsch et al., 2010).

Most of the studies are based on official statistics. Farmers' opinion surveys could be a useful tool to get a better understanding of the phenomenon. For example, J. Scott (2005) applied the qualitative research interview method to analyse farmers' attitudes towards farm income support programmes and subsidies, V. Vitunskienė, J. Baltušienė (2011) conducted a survey to deepen the knowledge about the role of direct payments for small farms. This study supplements limited research based on farmers' opinion survey and analyses the relations between the support and farm viability.

The main aim of the study was to identify the most vulnerable areas of Lithuanian agriculture, which could experience change if farmers' support was abolished. The following tasks were set: 1) to analyse the concept of viability, main viability indicators and propose criteria for the evaluation of socio-economic viability; 2) to determine the most vulnerable areas of Lithuanian agriculture applying selected socio-economic viability criteria; 3) to define the interconnections between dependence on farmers' support and viability status of farms identified.

Materials and Methods

The study consists of two sections applying different research methods. The first section provides the results of scientific literature review. The concept of viability is discussed and the selection of appropriate viability criteria is justified.

The second section provides the results of conducted survey on farmers' opinion towards their farm viability issues and the role of the support. The questionnaire was structured to classify farms in accordance with selected socio-economic viability criteria, the main viability factors of agriculture and the role of the support for continuity of farming. All respondents were beneficiaries of farmers' support.

Questionnaires were collected from June to July 2014. The study is based on the opinion of 937 farmers (the sample's confidence level is 95%, confidence interval – 3.2). Respondents were located in all counties of Lithuania (Alytus, Kaunas, Klaipėda, Marijampolė, Panevėžys, Šiauliai, Tauragė, Telšiai, Utena, Vilnius). The target group of the survey

was farmers' farms (further details of the survey methodology can be found in the section 'results and discussion'). Data were proceeded with IBM SPSS 22.0 software. The findings are based on the results of SPSS graphic displays, cross-tabulation and risk estimation reports.

Results and Discussion

The concept of viability and main research directions

There is no commonly agreed definition of viability and this research area challenges scientists' and policy-makers' attention around the world. Definitions of viability could be divided into two groups: 1) universal definitions mapping all dimensions of viability; 2) definitions designed for applied research.

Universal definitions are not bonded to viability thresholds, harmonized with the system theory approach and sustainability issues. For example, C. Park, M. Allaby (2013) describe viability as 'the ability to survive, or to live and develop normally'. H. Bossel (1999; 2001) proposes more system-orientated definition and underlines the impact of 'particular system environment' on system's viability. The researcher argues that all viable systems in the long-run must be sustainable and proposes to use terms 'viable' and 'sustainable' interchangeably, i. e. the author introduces economic, social and environmental dimensions of viability. The orientation theory is offered as a tool assisting in selection of viability criteria (Bossel, 1999). System-based viability criteria frameworks describe general attributes of analysed systems. The method provides a structure for indicator derivation (Van Cauwenbergh et al., 2007) and assists in selection of criteria accompanied by individual viability thresholds. However, the outcome is highly dependent on experts' knowledge and the selection of the right viability criterion is an open question. Different system-based frameworks could be created to monitor the same viability problem.

S. Baumgärtner, M.F. Quaas (2009) apply viability theory analysing issues of economic-ecologic viability. This theory applies mathematical tools to obtain a 'regulation map' assisting in governing viable system evolutions (Aubin et al., 2011). The selection of right tasks and description of environmental constrains of viable farm is a real challenge. To summarize, the research mapping all dimensions of universal definitions is limited and the most challenging issue of this research direction is the complexity of applied evaluation models and incompatibility of goals introduced by the sustainability concept. This research also faces a lack of environmental statistics, which could be used as reliable indicators of viability.

The application of definitions covering narrow aspects of viability and designed for the applied research became widespread. These definitions clearly identify the object of the research and viability threshold. Typical examples of such definitions are represented in research conducted by M. Morehart (2000), L. Connoly (2009), E. J. Dillon et al. (2009; 2010), J. M. Agrilés (2010), N. Jurkėnaitė (2013).

The most challenging direction of the performed research deals with the economic dimension of viability. The definitions are grouped into the short-run and the long-run economic viability. This classification determines the selection of viability indicators and thresholds. The short-run viability is associated with financial results of analysed year, while the definition of the long-run viability often deals with economic costs and attractiveness of farming business, compared to other activities. M. Morehart (2000) states that the revenue from the sale of goods of viable in the short-run farm must cover production costs. Other examples of indicators could be net farm income, expense to income ratio (Scott, 2001; Scott and Colman, 2008) and etc.

Scientists argue that negative indicators of the short-run viability do not explain farmer's decision to stay in business (Morehart, 2000; Agrilés, 2010). It is suggested including the long-run viability indicators into analysis. M. Morehart (2000), L. Connoly (2009), E. J. Dillon et al. (2009), J. M. Agrilés (2010), H. C. J. Vrolijk et al. (2010), E. J. Dillon et al. (2010), Agrosynergie (2011), A. Coppola et al. (2013) propose the indicators based on numerous methods of opportunity costs' assessment (the variation is based on different starting points evaluating remuneration for family labour, land and capital). Viable farms in the long-run operate at a profit.

The literature review shows that the link of performed research with the short-run and the long run economic viability is not compulsory. Researchers often use other financial or economic indicators useful for economic viability analysis. Most of these indicators are introduced from studies on financial stress, insolvency and bankruptcy prediction. The proposed methods evaluate viability applying individual indicators (Jakušonoka et al., 2008; Scott, Colman, 2008; Agrosynergie, 2011) or multi-criteria models for viability assessment (Kopta, 2009; Tamošaitienė et al., 2010). A farm is classified as viable if the threshold of one or group of criteria is satisfied.

The important direction of research is the analysis of non-financial indicators of viability. J. M. Agrilés (2010) argues that farms could be non-viable in the long-run even if economic viability criteria are satisfied. These farms face the generational renewal problem as young generation refuses to stay in agricultural business. Researchers propose different indicators to identify generational renewal problem on time: average age (Scott, Colman, 2008), structure

of farmers by age (Scott and Colman, 2008), ratios of critical age groups (Dillon et al., 2008), ageing index (Trisorio, 2004), demographic viability criteria (Dillon et al., 2008; Dillon et al., 2009; Dillon et al., 2010; Jurkėnaitė, 2013). It should be noted that the criterion of farm demographic viability goes beyond official statistics and shows the potential of family farms.

To summarize, the most popular directions of research on farm viability issues include socio-economic indicators. Clear and understandable criteria of farm viability must be selected to perform an opinion survey. The dimension of economic viability is analysed applying criteria of the short- and the long-run viability of the farm. The viable farm in the short-run generates income (without subsidies) that is sufficient to cover production costs. The evaluation is based on the respondent farms' financial results of 2013. The viable farm in the long-run operates in agricultural business for at least 5 years. It is assumed that a farmer confirms the attractiveness of agricultural business compared to other economic activities.

The indicator of demographic viability was included into the questionnaire. Demographically viable farm has young farmers (including family members) able to operate a farm. The age limit of 40 years was selected to identify a young farmer.

Viability of Lithuanian agriculture: farmers' opinion survey

Three important factors were selected to characterize the most vulnerable aspects of viability in agriculture: type of farming, size of the farm and farmer's age. The percentage of viable farms in the analysed group was derived by calculating the share of farms corresponding viability criterion in selected group of farms.

To describe type of farming the prevailing share of product (50.0% and more) in the structure of farm income was used. Respondent farms were classified into five groups: crop production, livestock, horticulture, mixed (income from crop and livestock production is balanced ± 10.0%), other. The majority of farms were classified as crop production (44.7%), livestock (26.8%) and mixed (17.0%). Horticulture and other farms accounted for 4.5% and 7.0%, respectively.

The comparison of selected indicators of the short- and the long-run economic viability by type of farming shows a significant difference (Fig. 1). The vast majority of farmers declared losses in 2013, and their farms were non-viable in the short-run. However, the share of farms viable in the long-run was much higher. The conducted survey shows that crop production was the most viable type of farming. The short-term viability indicators of other types of farming did not exceed 41.0%.

It should be noted that the long-run economic and demographic viability indicators by different types of farming are almost similar. The share of farms with young farmers is higher than the share of farms willing to stay in agricultural business at least 5 years (with the exception of mixed farms). The gap between the long-run economic viability and demographic viability indicators in livestock farms is higher than in other types of farming. This sector could face the generational renewal problem if this trend continues.

The distribution of respondent farms by size was as follows: 1–4.9 ha (14.4%), 5–19.9 ha (25.3%), 20–29.9 ha (14.3%), 30–49.9 ha (11.7%), 50–99.9 ha (17.1%), 100 ha and more (17.2%). The survey results show that the highest share of non-viable farms belongs to the group of farms below 30 ha (Fig. 2). The farms below 5 ha is the most vulnerable as the low short-run viability indicator is accompanied by the lowest indicators of the long-run viability. The 2010 Agricultural Census of the Republic of Lithuania shows that the farms below 5 ha account for 58.7% of the farms larger than 1 ha. A low indicator of demographic viability could be treated as a threat

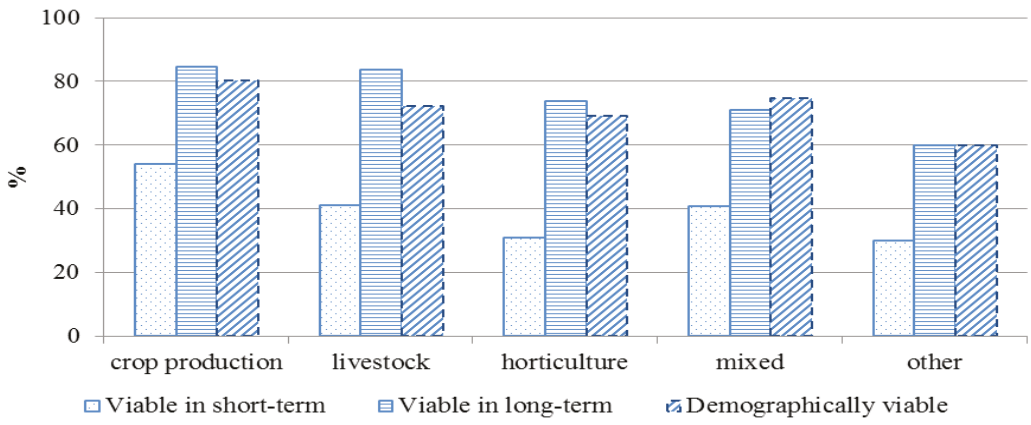

Figure 1. Viable farms by type of farming.

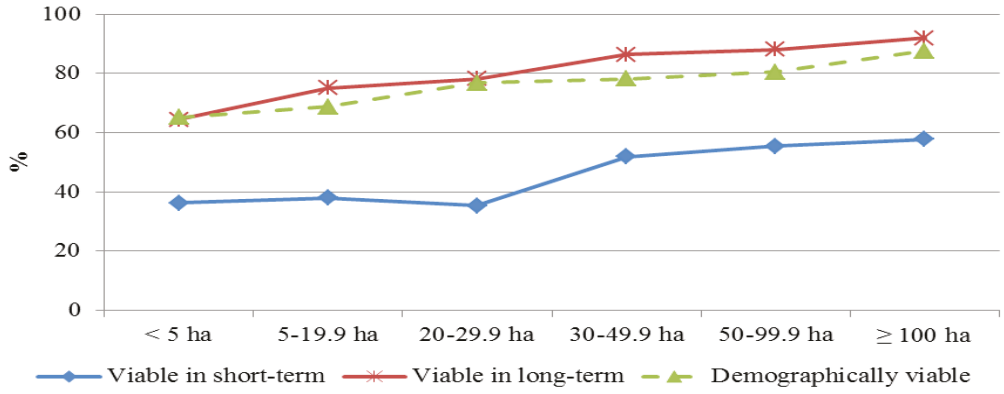

Figure 2. Viable farms by size.

of structural changes in the immediate future. Figure 2 shows that the share of viable farms is growing together with the size of the farm. Farmers operating larger farms have successors and wish to keep family farms in business.

Three farmers' age groups were identified: 1) younger than 40 years old, 2) 40–59 years old, 3) 60 years old and older. The first group, i. e. young farmers, accounted for 35.6%. The share of 60 years old and older farmers was 20.0%. The farmer's age does not determine the short-term viability of a farm. By age, the highest share of non-viable farms was operated by the farmers aged 60 or older. This group of farms faces generational renewal challenge. According to the results of the 2010 Agricultural Census of the Republic of Lithuania, the farmers aged 60 or older exceeded one-third of the Lithuanian farms.

The conducted analysis of selected viability indicators by type of farming, farm size and farmers' age has identified the most vulnerable areas. However, respondents can change their behaviour in case if farmers' support is abolished. SPSS risk estimation function was used to analyse consequences of the farmers' support abolition. To evaluate possible changes in agriculture, the farmers were asked to answer the following question: '*Will you stay in farming business if farmers' support is abolished?*' One-third of farmers could not answer this question and this group was rejected from the risk estimation data set.

The results of SPSS risk estimation (i.e. odds and relative risks and the 95.0% confidence intervals for calculated risks) are introduced in the Table 1. The risk estimation function investigates the relationship between different viability indicators (treated as a 'risk factor') and the occurrence of certain condition (intention of staying in agricultural business without farmers' support). It is important to note that risk estimation was accompanied by Chi-square test of homogeneity. The test confirmed statistical significance of relations for the analysed groups (p-values were less than 0.05).

Odds ratios for all viability indicators show that the behaviour of viable and non-viable farms in case of support abolition differs. The odds ratio shows that the probability to stay in agricultural business without farmers' support for viable farms is 2.5 times higher (CI 95% 1.8 to 3.5) than for non-viable ones in the short-run, for viable ones in the long-run – 3.6 (CI 95% 2.2 to 6.0), for demographically viable – 1.5 (CI 95% 1.0 to 2.2).

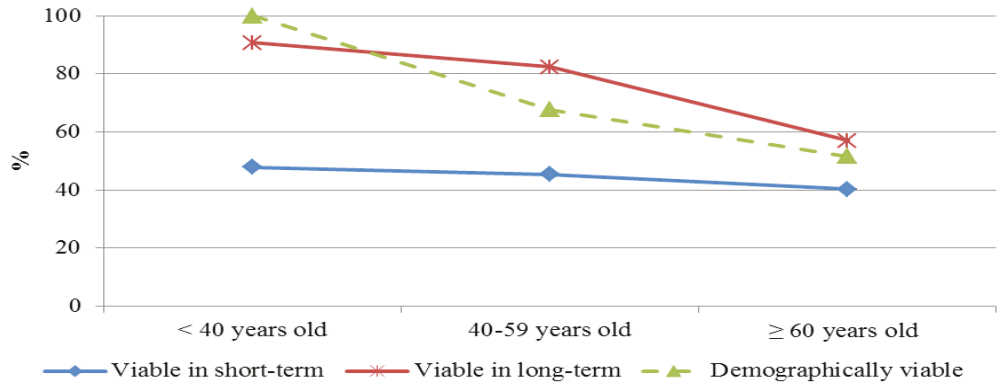

Figure 3. Viable farms by age groups.

Table 1

Risk estimates for farmers' behaviour after support abolition by viability criteria

	Value	95% confidence interval	
		lower	upper
Odds Ratio for the short-term viability (viable / non-viable)	2.510	1.814	3.474
For cohort *Will you stay in farming business if farmers' support is abolished?* = yes	1.760	1.439	2.153
For cohort *Will you stay in farming business if farmers' support is abolished?* = no	0.701	0.615	0.800
Odds Ratio for the long-term viability (viable / non-viable)	3.638	2.201	6.011
For cohort *Will you stay in farming business if farmers' support is abolished?* = yes	2.489	1.667	3.716
For cohort *Will you stay in farming business if farmers' support is abolished?* = no	0.684	0.612	0.765
Odds Ratio for the demographic viability (viable / non-viable)	1.507	1.040	2.185
For cohort *Will you stay in farming business if farmers' support is abolished?* = yes	1.302	1.016	1.670
For cohort *Will you stay in farming business if farmers' support is abolished?* = no	0.864	0.763	0.978

The relative risk between viable and non-viable in the short-run farms for the group of staying in agricultural business without farmer's support is 1.8 (CI 95% 1.4 to 2.2) and 0.7 (CI 95% 0.6 to 0.8) for the group of leaving business without farmer's support. Cross-tabulation of the short-run viability and respondents' intention to stay in business without support confirms that viable farms are more likely to stay in business. The share of viable farms staying in business is higher than the share of viable farms leaving farming in these groups: 1) below 5 ha and larger than 50 ha, 2) operated by young farmers, 3) crop production and horticulture.

The relative risk between viable and non-viable in the long-run farms for the group of staying in farming without support is 2.5 (CI 95% 1.7 to 3.7) and 0.7 (CI 95% 0.6 to 0.8) for the group of leaving agricultural business without farmer's support. Cross-tabulation of the long-run viability and farmers' willingness to stay in business without support confirms that viable farms are more likely to continue farming. The less vulnerable groups of viable farms were as follows: 1) below 5 ha and larger than 100 ha, 1) crop production.

The relative risk between demographically viable and non-viable farms for the group of staying in farming without support is 1.3 (CI 95% 1.0 to 1.7) and 0.9 (CI 95% 0.8 to 1.0) for the group of leaving agricultural business without farmer's support. Cross-tabulation of the demographic viability and farmers' willingness to stay in farming without support shows that viable farms are more likely to stay in business. However, the gap between viable farms staying in farming without support and leaving is lower than for other viability criteria. Viable farms larger than 100 ha were more likely to continue farming than leaving the business.

Conclusions

The analysis of scientific literature shows that the concept of viability is multi-dimensional. Farm's viability could be conceptualized as viability of the system mapping all dimensions of sustainable development. However, the performed studies propose a vast majority of estimation criteria and methods focusing on narrow definitions of viability designed for the applied research.

The survey focuses on the short- and the long-run dimensions of economic viability. The results show that care should be taken with the interpretation of viability based on the short-run indicators. According to the survey results, the share of farms willing to stay in business for at least 5 years was significantly higher than the share of farms viable in the short-run. The indicators of the long-run and the demographic viability demonstrated the same distribution trends by type of farming, size of the farm and farmers' age.

The analysis of all indicators of viability shows that the highest share of non-viable farms belongs to these groups: 1) farms below 5 ha; 2) farms operated by farmers aged 60 or older. These farms represent a significant share of Lithuanian agriculture. The survey shows that horticulture, mixed and other farming also face viability challenge.

The risk estimation shows that farmers' support plays a significant role. Viable farms are more likely to stay in business without support. The groups of farms with the highest concentration of non-viable farms could be named as the most vulnerable. The risk estimation applying different indicators of viability shows that the highest odds ratio was for the indicator of the long-run viability (3.6), while the lowest – for demographical viability (1.5).

References

1. Agrosynergie (2011) *Evaluation of Income Effects of Direct Support*, Brussels: EEIG Agrosynergie, 261 p.
2. Argilés J.M. (2010) Accounting Information and Prediction of Farm Non-Viability. *European Accounting Review*, 10(1), pp. 73-105.
3. Aubin J.-P., Bayen A.M., Saint-Pierre P. (2011) *Viability Theory: New Directions*, 2nd edition, Springer-Verlag Berlin Heidelberg, 830 p.
4. Baumgärtner S., Quaas M.F. (2009) Ecological-Economic Viability as a Criterion of Strong Sustainability under Uncertainty. *Ecological Economics*, 68(7), pp. 2008-2020.
5. Bossel H. (1999) *Indicators for Sustainable Development: Theory, Method, Applications*, Canada: International Institute for Sustainable Development, 124 p.
6. Bossel H. (2001) Assessing Viability and Sustainability: a Systems-based Approach for Deriving Comprehensive Indicator Sets. *Conservation Ecology,* 5(2), pp. 1-12.
7. Connolly L. (2009) Changing Structure and Production Patterns of Irish Agriculture – Trends and Prospects. *The 17th International Farm Management Congress: Congress Proceedings*, Illinois: Illinois State University, vol. 1, pp. 487-502.
8. Coppola A., Scardera A., Tosco D. (2013) Economic Profitability and Long-Term Viability in Italian Agriculture. *PAGRI,* 1/2013, pp. 71-84.
9. Dillon E., Hennessy T., Hynes S., Commins V. (2008) Assessing the Sustainability of Irish Farming. *The 107th EAAE Seminar 'Modelling of Agricultural and Rural Development Policies',* Sevilla, Spain, pp. 1-15 p.
10. Dillon E.J., Hennessy T., Hynes S. (2009) Towards Measurement of Farm Sustainability – an Irish case study. Paper prepared for presentation at *the International Association of Agricultural Economists Conference*, Beijing, China, pp. 1-21 p.
11. Dillon E.J., Hennessy T., Hynes S. (2010) Assessing the Sustainability of Irish Agriculture. *International Journal of Agricultural Sustainability*, 8(3), pp. 131-147.
12. Fritzsch J., Wegener S., Buchenrieder G., Curtiss J., Gomez y Paloma S. (2010) *Economic Prospect for Semi-Subsistence Farm Households in EU New Member States*, Luxembourg: Publications Office of the European Union, 326 p.
13. Jakušonoka I., Jesemčika A., Ozola E. (2008) Assessment of Economic Viability for Agricultural Holdings Included into the FADN of Latvia. *Economic Science for Rural Development*, 17, pp. 77-86.
14. Jurkėnaitė N. (2013) Lietuvos ūkių demografinis gyvybingumas (Demographic Viability of Lithuanian Farms). *Management Theory and Studies for Rural Business and Infrastructure Development,* 35(4), pp. 544-553. (in Lithuanian).
15. Kopta D. (2009) Possibilities of Financial Health Indicators Used for Prediction of Future Development of Agricultural Enterprises, *Agricultural Economics – Czech*, 55(3), pp. 111-125.
16. Morehart M. (2000) A Fair Income for Farmers? *Agricultural Outlook*, AGO-271, May 2000, pp. 22-26.
17. Park C., Allaby M. (2013) *Dictionary of Environment and Conservation*, 2nd edition, Oxford: Oxford University Press, 504 p.
18. Scott J. (2001) *The Nova Scotia Genuine Progress Index Soils and Agriculture Accounts. Part 1: Farm Viability and Economic Capacity in Nova Scotia*, NS: GPI Atlantic, 71 p.
19. Scott J. (2005) *Farm and Community Viability*, NS: GPI Atlantic, 116 p.
20. Scott J., Colman R. (2008) *The GPI Soils and Agriculture Accounts: Economic Viability of Farms and Farm Communities in Nova Scotia and Prince Edward Island – an Update*, NS: GPI Atlantic, 87 p.
21. Tamošaitienė A., Juškevičienė D. Kriščiukaitienė I., Galnaitytė A. (2010). Ūkininkų ūkių verslo stabilumo vertinimas naudojant finansinės analizės santykinius rodiklius (Farmers Farms Business Stability Assessment Using Financial Analysis of Comparative Indicators). *Management theory and studies for rural business and infrastructure development*, 5(24), pp. 173-185. (in Lithuanian).
22. Van Cauwenbergh N., Biala K., Bielders C., Brouckaert V., Franchois L., Garcia Cidad V., Hermy M., Mathijs E., Muys B., Reijnders J., Sauvenier X., Valckx J., Vanclooster M., Van der Veken B., Wauters E., Peeters A. (2007) SAFE – A hierarchical framework for assessing the sustainability of agricultural systems. Agriculture, Ecosystems and Environment 120, pp. 229-242.
23. Vitunskienė V., Baltušienė J. (2011) Tiesioginių išmokų žemės ūkio veiklai socialiniai padariniai paramos gavėjų subjektyviu vertinimu (Subjective Approach to Social Effects of Direct Aid to the Agricultural Producers). Management theory and studies for rural business and infrastructure development, 5(29), pp. 211-220. (in Lithuanian).
24. Vrolijk H.C.J., de Bont C.J.A.M., Blockland P.W., Soboh R.A.M.E. (2010) Farm Viability in the European Union. Hague: LEI. 67 p.