THE EFFECT OF TAXES AND SUBSIDIES ON ECONOMIC VIABILITY OF FARMS

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Abstract. *The article deals with the effect of support and taxes on economic viability of farms. Assessment of economic viability of farms has suggested that in Lithuania, support is the main external factor of continued viability of small- and mid-sized farms, while the unequal distribution of the tax burden reduces economic viability of farms and they become non-viable. The problem put forward in the research is what taxation system would create conditions for the farmers' farms to remain viable, irrespective of the support. Alternatives on improvement of farmer taxation system are proposed. The paper presents the practice of farmer taxation in other countries and analysis of scientific literature on the subject, on the basis of which the model for improvement of farmer's profit taxation, as well as social and healthcare insurance contribution is put forward. This model would ensure more equal distribution of tax burden between the farms of different sizes, which would allow the farms to remain viable irrespective of the scopes of the received support.*

Keywords: economic viability of farms; taxes; subsidies.

Introduction

Agricultural activity has gradually been becoming a profitable business and has been subject to progressive inclusion of farms into the general taxation system of the country. As a result of such inclusion, possibilities for farms to maintain viability have been changing. In light of such changes, the effect of taxation on viability of farms must be assessed in order to develop a coherent and effective state taxation system supported by legislation and scientific research that would promote growth of national economy and ensure social justice for all stakeholders of the economy, including conditions for continued viability of farms.

Researchers across the globe have engaged in comprehensive analysis of economic viability of farms (Adelaja & Sullivan, 1998; Argilés, 2001; Boullet et al., 2012; Huck, 2007; Lapping & Fitzsimons, 1982; Popelier, 2005; Singh, Bhullar & Joshi, 2009; Scott, 2001; Whitaker, 2009). Nonetheless, the studies usually tend to focus on the effect of direct support that promotes greater viability, but fail to consider the extent to which economic viability of farms is reduced by the national taxation systems. As a result, assessment of viability of farms within the context of taxation has remained a relevant research object.

Research problem: what taxation system would provide conditions for continued viability of farmers' farms, irrespective of the support granted?

Research aim: to assess the effect of taxation system on economic viability of farms.

The following objectives have been set out to reach the research aim:
- To define the concept of economic viability and assessment indicators.
- To identify the main issues in taxation of the farmers' farms.
- To put forward proposals on the most appropriate taxation system in view of the possibilities for farms to maintain economic viability, on the basis of analysis of taxation practice in relation to the farmers' farms.

Research methodology. Comparative and systematic analysis of research works by other researchers, literature on economics, and analytical works has been performed in order to determine and assess the research problem. The methods of data grouping, specification and classification; horizontal, vertical, relative indicators (ratio) analysis, graphic data representation, logical abstraction, and statistical analysis have been used in the research. The research is based on generalisation of taxation practice in relation to farmers' farms in the EU as well as accountancy data of the farmers' farms included in the FADN data network. Data of the Lithuanian respondent farms included into the FADN 97 have been used in the study. Inclusion of farms into the FADN is based on two key indicators: economic size of a farm that defines its yield potential, and the type of farm that defines its specialization; the farms are grouped by economic size (ES) by random sampling. In order to summarize the research findings and provide clearer definition of the pattern of economic viability of farms, the farms have been grouped into four groups by ES: very small farms (standard output (SO) from 4 000 to 8 000 €), small-sized farms (SO: 8 000 – <25 000 €), mid-sized farms (SO: 25 000 – <100 000 €), and large-sized farms (SO: 100 000 € and more).

Methodology for assessment of economic viability of farmers' farms

Economic viability of a farm IS its capability of survival, continued operation, and development using the available resources. According to researchers, viability is largely determined by two external factors: subsidies that help maintain economic viability of farms and taxes that are the major negative factor of economic viability of farms.

Analysis of the literature has suggested that a wide range of indicators characterising farm's viability are used, although not all of them being significant. In this study, economic viability is assessed by four indicators (Table 1) determined as the most significant for determination of economic viability of a farm in the empirical study by Savickienė and Slavickienė (2012a).

Table 1. Key indicators of economic viability of a farm (Savickienė & Slavickienė, 2012a; Scott, 2001)

Indicators	Factor analysis models	Factor description	Viability Threshold
Return on investment	$((TO + SEI) - VUL) / ((CA + FA) - (STD + LTD))$	TO – total output SEI – subsidies excl. investment VUL – value of unpaid labour (farmer and family members) CA – current assets FA – fixed assets STD – short-term debt LTD – long-term debt	More than 5 %
Expense to income ratio	$(INTCON + DEP + EXF) / (TO + SEI)$	INTCON – intermediate consumption DEP – depreciation EXF – external factors TO – total output SEI – subsidies excl. investment	Less than 80 %

Debt to net income ratio	(STD + LTD) / ((TO + SEI) − (INTCON + DEP + EXF))	STD – short-term debt LTD – long-term debt TO – total output SEI – subsidies excl. investment INTCON – intermediate consumption DEP – depreciation EXF – external factors	Less than 600 %
Direct payments to producers and dependency ratio	SEI / ((TO + SEI) − (INTCON + DEP + EXF))	SEI – subsidies excl. investment TO – total output INTCON – intermediate consumption DEP – depreciation EXF – external factors	Less than 20 %

The aforementioned indicators are calculated under two modes, i.e. adjusted for the support or not adjusted for the support. After main taxation issues are identified and good practice of farm taxation in the EU is summarized, alternative options will be developed for simulation of economic viability of farms and choice of the most appropriate farm taxation system.

Scientific rationale behind improvement of taxation systems for farmers' farms

Improvement of taxation systems for farmers' farms is relevant for scientific research. This subject has been little studied in Lithuania. Analysis of the recent research literature published in the period of inclusion of farmers into the common national taxation system in Lithuania (since 2009) has suggested that only a few researchers (Grakauskas & Marcijonas, 2005; Juškevičienė, 2012; Juškevičienė & Lakis, 2010; Miceikienė, Novošinskienė & Savickienė, 2014; Savickienė & Slavickienė, 2012a) have analysed the taxes paid by farmers and the relating issues.

Farmer taxation has not been analysed comprehensively, i.e. by looking at individual taxes, although taxes are referred to as one of the causes for reduction of economic viability of farms in the literature (Miceikienė, Novošinskienė & Savickienė, 2014; Savickienė & Slavickienė, 2012b).

Researchers in other countries have shown deeper inquiry into this subject. Analysis of scientific publications has suggested that several scientific approaches towards the issue exist:
- researchers who claim that farmer taxation should be dissociated from the general national taxation policy, farmers should be provided with preferential taxation conditions due to unique nature of their activity, while privileges are referred to as support to agriculture (Cahill, 2006; Hill & Blandford, 2007; Parlińska, 2008; Rajaraman, 2004; Savickienė & Savickienė, 2012a);
- researchers who claim that privileges related to farmer taxation do not comply with the principle of fair taxation and should either not be applied or apply to everyone (Zhong, Turvey, Zhanga & Xu, 2011);
- the effect of tax reform on development of agriculture (Johannesen, 2010; Juškevičienė & Lakis, 2010);
- smaller enterprises, farms should not be subjected to the same taxation rules and principles as the ones that apply to large-sized business entities (Casamatta, Rausser & Simon, 2011);
- lower income tax as one of the possible measures for reduction of inequality in farm income (Fuest, Peichl & Schaefer, 2008; Zee, 1995);
- the effect of the tax rate, tax burden, tax base on economic viability of a farm (Grakauskas & Marcijonas, 2005; Juškevičienė & Lakis, 2010; Savickienė & Slavickienė, 2012b).

According to Hill and Blandford (2007), high tax rate applied to farmers' farms may be compensated by many exceptions in one country. On the other hand, another country may apply low tax rates without any privileges. Thus, although tax treatment of farmers' farms may seem similar in different countries, privileges must be considered in order to compare the countries, irrespective of whether tax rates are high or low.

Authors of this paper support the approach that farmer taxation should be dissociated from the general national taxation system. Farming is imminently dependent on ambient conditions (Adelaja & Sullivan, 1998; Adelaja, Garcia, Gibson & Lake, 2007). Viability depends on climate conditions, use of natural

resources. If the farmer's soil is fertile, his/her income will be higher than the income earned by farmers who operate on a soil of low-scored fertility. Economic viability of farms also depends on social-demographic changes. Huck (2007) has emphasized that economic viability of farms depends on economic fluctuations (viability is lower during the periods of crisis).

Having analysed the issues listed by other researchers, authors of this paper have identified the following main issues in taxation of farmers' farms:
- unequal taxation treatment of farmers has been identified in Lithuania, as the farmers are grouped into 4 groups that are subject to different state social insurance and healthcare insurance contribution rates and different tax base. This system does not correlate with income earned by farms, and reduces economic viability of small- and mid-sized farms disproportionately;
- income tax applying to farmers' farms does not satisfy the principle of fair taxation due to limited application of non-taxable amount of income, as the exemption does not apply to farmers' income;
- farmers are not allowed to reduce the taxable income by the incurred life insurance, retirement savings, study expenses, which means that taxation of farmers' income does not comply with the principle of fair taxation;
- differentiation of farms by grouping them into 4 groups by economic size and VAT payer's status for taxation purposes increases complexity of the taxation system, does not satisfy the principles of taxation, leads to regressive nature of the system, increases tax burden on small- and mid-sized farms, and reduces tax burden on large-sized farms.

The identified farmers' farm taxation issues have suggested that high tax burden leads to reduction of economic viability of small- and mid-sized farms exactly due to these issues. Hence, taxation system must be improved in order to enhance economic viability of farmers' farms in Lithuania.

Analysis of farmers' farm taxation practice in the EU countries

Taxation systems of the EU member countries are based on a number of complex social and economic factors, such as taxpayers' culture, cost of living, consumption habits, attitude towards the role of state in economics, and the level of awareness of society about the importance of taxes.

Comparison of different taxation systems may be very practical for the research. Many studies have demonstrated high level of similarity between taxation systems of the EU countries, irrespective of differing social-economic and political factors. Analysis of taxation systems of the EU countries has shown that some of the analysed countries apply a separate taxation system for agriculture, why others do not have such a distinction. Nonetheless, farmers' farms, as taxpayers, are treated differently compared to other professionals, and the agricultural sector receives special taxation treatment. Analysis of farmers' farm taxation in the EU countries has essentially shown the following main concepts:
- application of general taxation system: agriculture is subject to same taxation principles, legal base as other groups of profession:
1) taxation system does not offer any instruments (privileges) to support agriculture (Finland);
2) taxation system offers a number of different preferential instruments, such as investment reliefs and other exemptions (the Netherlands, Spain, Belgium, the United Kingdom, Ireland, Denmark, Sweden, Slovakia);
- special (preferential) taxation system: separate legislation on taxation, regulations applying to farmers, aimed at reducing the tax burden (Austria, Germany, France, Italy, Poland) (Soliwoda & Pawlowska-Tyszko, 2014).

Taxation of profit (taxable income) is one of the main components of a taxation system. EU countries may be grouped into two groups by taxation of profit (taxable income):
- countries exercising relatively low tax rate on farmers' taxable income: the Czech Republic, France, Greece, the Netherlands, Poland, and Spain;
- countries exercising high tax rate on farmers' income: Belgium, Denmark, Finland, England, Ireland. The situation reflects the classification based on the "southern" and "northern" tax mentalities (Krajewska, 2010).

Authors of this paper suggest attributing Lithuania to the group of low tax rate that applies to agricultural income. All Lithuanian farmers, VAT payers, receiving income are subject to personal income tax rated at 5 %, while non-VAT payers are exempt from this tax. This suggests that general taxation system is applied to agriculture in Lithuania, with certain privileges, however.

Ireland, the United Kingdom apply certain privileges and investment promotion measures in taxation for farmers' farms, and these measures are instruments of the general taxation system. Same situation has been observed in the Netherlands, Denmark, Spain, and other countries. Finland is considered as most unfavourable in terms of farmer taxation in the EU, and does not apply any special privileges to farmers. Austria, Germany, France, Italy have chosen a different taxation system and apply special preferential taxation systems for farmers (Internal Revenue Service, 2014).

Special taxation treatment in relation to profit (taxable income) in agriculture should be based on various criteria, while tax base is the most popular criterion (Casamatta et al, 2011; Grosu & Socoliuc, 2008). Two concepts are used both in theory and in practice of tax base estimation: causal and effect-based. The first concept suggests that, when major taxation factors of n farm viability are calculated, land and buildings must be accounted for in order to calculate the accumulated tax. The second notion implies the basis for income, production, or income results excluding their sources. It should be noted that due to different methods applied by various member countries of the European Union to calculation of farm income, the map of taxation system is rather colourful.

In general, it may be claimed that EU member countries could be grouped into three groups by the farmers' farm taxation systems:
- countries applying special preferential taxation systems to agriculture;
- countries applying limited privileges to agriculture;
- countries applying taxation system without any taxation preferences to agriculture.

Main taxes paid by farmers' farms in all the analysed countries are wealth tax, personal income/profit tax, mandatory healthcare insurance contributions, state social insurance contributions. These taxes may have essential effect on viability of farmers and agricultural enterprises, and the study further analyses the taxes paid by farmers in the EU countries that have been sampled for the study.

The analysis has suggested that the taxable base in other countries is largely formed of *taxable income*, while the tax rates are considerably higher compared to those in Lithuania. Progressive taxation of income has been observed in many analysed countries.

In Lithuania, social and healthcare insurance contributions paid by farmers depend on the farm size and farm status with reference to VAT. Social and healthcare insurance paid by farmers in other European countries is characterised by various trade-offs that depend on farm size, income or yield.

Eirošius, Kriščiukaitienė and Namiotko (2012) have analysed social insurance paid by Lithuanian farmers and identified that the main issue, in this case, is the twofold tax burden: if the farmer's income falls within the range between minimum wage and average insured income, fixed tax burden applies, but the burden tends to reduce due to contribution ceiling (where actual income is higher than the insured income), as a farmer pays the fixed contribution only, irrespective of the income. The size of retirement pension also becomes fixed, irrespective of the income earned.

Thus, tax burden is fixed despite growth of a farmer's income, and starts reducing as soon as certain threshold is reached. This leads to reduction of economic viability of very small, small- and mid-sized farms, irrespective of the income earned by the farmer, i.e. of whether or not he/she is capable of paying social insurance contributions.

The scope of farmers' social insurance in other European countries is reviewed further. The scope of social and healthcare insurance provided to farmers in the European countries is wider than in Lithuania, while the contributions depend not only the farm size (which is the only factor in Lithuania), but also on land fertility, value of land ownership, earned income, farmer's age, etc.

Based on the research and practice in other countries, the following alternatives for taxation of farmers' farms in Lithuania have been developed (these alternatives are applicable to other countries for improvement of their taxation systems as well).

For taxation of farmers' profit:

- Fixed non-taxable income, with 5 % personal income tax applied in case the fixed threshold is exceeded.
- Farmer taxation similar to taxation of other registered self-employment activity (5 % tax rate applied to profit earned).
- Progressive taxation of personal income earned from agricultural activity (0 to 15 %).

For farmers' taxation by state social and healthcare insurance contributions:

- Social and healthcare insurance contributions paid by farms related to the minimum wage, i.e. contributions to be paid, if the income exceeds the minimum monthly wage (MMW), or starting with the month, when minimum income for the calendar year has reached the minimum amount (MMW×12).Contributions are paid based on the taxable income;
- Social and healthcare insurance contributions paid by farmers similar to contributions paid by persons engaged in other registered self-employment activity (50 % of profit is subject to 28.5 % of social insurance contributions and 9 % of mandatory healthcare insurance contributions), i.e.no ES-based distinction between farmers' farms for the purpose of contribution payment.

Simulation and assessment of alternatives of the personal income tax, social insurance, and healthcare insurance have been implemented based on the developed model for improvement of farmers' farm taxation system aimed at supporting and improving economic viability of farms.

In case of the Alternative 1 under the model for improvement of farmers' farm taxation system, the example of Ireland is applicable, where non-taxable amount of income applies to income earned at a farmer's farm, i.e. annual income from agricultural activity exceeding 24 MMW (7200 EUR) is subject to taxation. Taxable income earned at 97 farms in 2013 has been chosen for the analysis.0 % tax rate applies to income received at a farmer's farm from agricultural activity that does not exceed 24 MMW; if the income is exceeded, 5 % tax rate applies. Alternative 2 represents an actual situation, where income earned at the Lithuanian farmers' farms from agricultural activity is subject to 5 % tax rate without any non-taxable amount of income.

In general, Figure 1 suggests that Alternative 1 may be appropriate for solution of one of the issues identified in the study, namely, non-compliance of the personal income tax with the principle of fair taxation caused by absence of any non-taxable amount of income for the income earned at farmers' farms from agricultural activity. Empirical studies has demonstrated that, with the non-taxable amount of income (24 MMW) applied, the paid amount of the personal income tax would always be lower, and 14 farms of all the analysed sample would be exempt from the personal income tax, although they did pay it in 2013.7 of the 14 farms, which would be exempt from personal income tax due to non-taxable amount of income, belong to the group of very small and small-sized farms, meaning that this measure would improve economic viability of such farms as well.
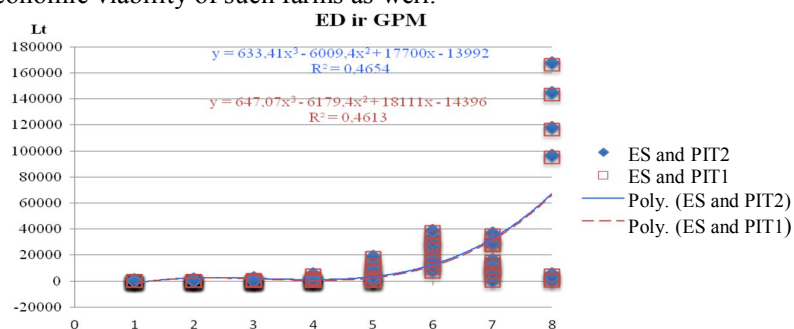

Figure 1. Payable personal income tax according to the model for improvement of the farmers' farm taxation system

In case of Alternative 3, the situation, where taxable income earned at farms is subject to progressive taxation system, is simulated. An assumption that the taxation rate increases along with increase of income from sale has been made.
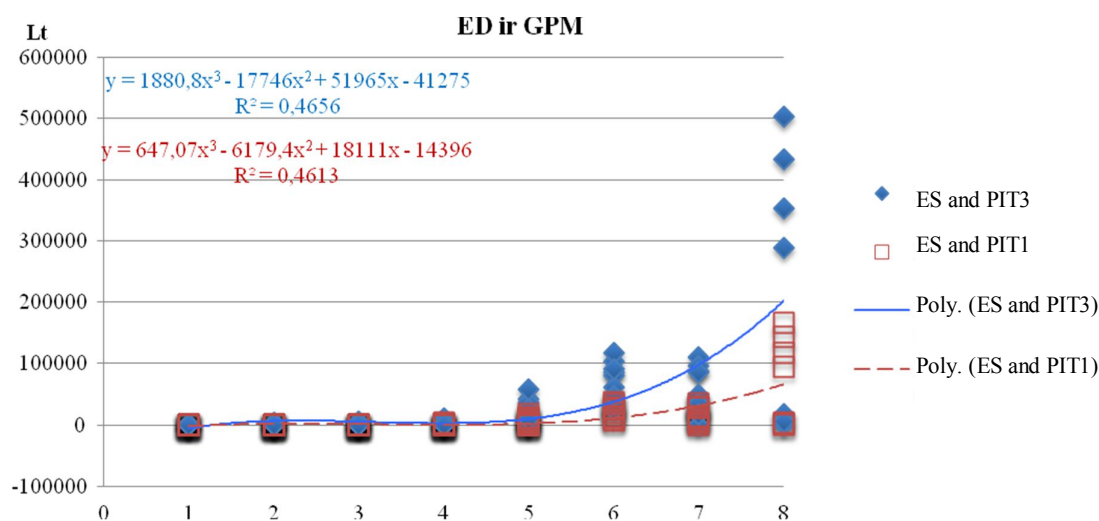

ED ir GPM

$y = 1880,8x^3 - 17746x^2 + 51965x - 41275$
$R^2 = 0,4656$

$y = 647,07x^3 - 6179,4x^2 + 18111x - 14396$
$R^2 = 0,4613$

♦ ES and PIT3

□ ES and PIT1

— Poly. (ES and PIT3)

- - - Poly. (ES and PIT1)

Figure 2. Payable personal income tax in cases 2 and 3 in 2013 according to the model for improvement of the farmers' farm taxation system

Pursuant to the study findings (Figure 2) and by differentiation of farm income from sale as well as application of the respective tax rates, the amount of personal income tax payable by all the analysed large-sized farms or farms with ES > 100 would be twice as high as the amount paid in 2013.As a result, tax burden on such farms is higher. On the other hand, this principle would help solve the issue identified in the second part of the work, namely, the complexity of taxation system caused by differentiation of farms into 4 groups by farm's economic size and VAT payer's status.

This would reduce tax burden on very small, small- and mid-sized farms that maintain their viability by receiving subsidies, and increase tax burden on the large-sized farms that are viable both with and without subsidies. Progressive taxation of income from agricultural activity would comply with the principle of fair taxation, as taxpayers of the same economic capacity would be subject to same taxation.

For solution of the identified issue, namely, that mandatory social and healthcare insurance contributions paid by farmers do not comply with the principle of fair taxation due to unequal proportion of the income paid to the state, the authors of this study have put forward two alternatives in their model for improvement of farmers' farm taxation that they have applied to the analysed farms and assessed.

Calculations in case 1 have shown that amounts of contributions would increase significantly for the farmers' farms that exceed the annual 12 MMW threshold of the taxable income from agricultural activity, in case the first model is applied. It is therefore important to determine the effect of such situation on economic viability of these farms, which would also help determine the applicability of the applied model.

The study further assesses the model of case 2 that refers to improvement of social and healthcare insurance contributions paid by farmers. Under this model, farmers' farms would receive equal contribution-related treatment as other registered self-employment activities, which means that farmers' farms are not grouped by ES for the purpose of contribution payment. This model is more applicable to Lithuanian farmers' farms, as it complies with the principle of fair taxation. In case state social insurance and mandatory healthcare insurance contributions paid by farmers' farms are the same as those paid by

persons engaged in other registered self-employment activity, the contribution payment system would be clearer and simpler, and would reduce tax burden on farms with smaller income. However, it is important to analyse the effect of such system on economic viability of farmers' farms.

In order to assess the applicability of the proposed alternative for improvement of farmers' farm taxation aimed at maintaining and improving economic viability of farms, the authors of this paper have recalculated 3 viability indicators (expense to income ratio, debt to income ratio, direct payments to producers and dependency ratio) in 2013 for all the analysed farmers' farms. The indicators at analysed farmers' farms were recalculated taking into account the change of external factors at each farm in case of each individual model.

Table 2. Lithuanian farmers' farms by farm ES with expense to income ratio < 80 %, 2013 (developed by the authors)

Farm size	Farm groups by ES	Number of viable farms with expense to income ratio < 80 %, 2013						Number of farms in group
		Adjusted for subsidies	Adjusted for subsidies, Altern. 1	Adjusted for subsidies, Altern. 2	Not adjusted for subsidies	Not adjusted for subsidies, Altern. 1	Not adjusted for subsidies, Altern. 2	
Very small	4 - 8	12	13	13	7	8	8	13
Small-sized	8 - 15	14	14	14	9	11	11	14
	15 -25	14	14	14	6	9	9	14
Mid-sized	25- 50	14	14	14	12	14	14	14
	50 - 100	14	14	14	14	11	11	14
Large-sized	100 - 250	11	11	11	11	11	11	11
	250 -500	10	11	11	11	11	11	11
	500 - 750	7	6	6	6	6	6	6
Total of farms		96	97	97	76	81	81	97
Inclusive of the share of viable farms, %		99	100	100	78	84	84	100

Data presented in Table 2 have suggested that, if Alternative 1 and Alternative 2 of the model had been applied to farmers' farms in 2013 in order to improve taxation system in relation to social and healthcare insurance contributions paid by Lithuanian farmers' farms, 100 % of farms would have maintained viability regardless of the group. According to calculations of the same indicator at the analysed farms for the year 2013, almost 99 % of the farms have been determined as viable; however, if not adjusted for subsidies received by a farm, only 78 % of farmers' farms would be determined as viable. On the other hand, only 84 % of farmers' farms would maintain viability according to the estimated expense to income ratio adjusted for subsidies attributed to income at the analysed farmers' farms under Alternative 1 and Alternative 2.The share of viable small-sized farms and mid-sized farms would increase by, respectively, 33 % and 56 %, while all large-sized farms (100 %) would remain viable, same as earlier. Thus, if Alternative 1 and Alternative 2 aimed at improvement of social and healthcare insurance contributions are applied, economic viability of small- and mid-sized farms increases according to the viability indicator adjusted for subsidies.

According to another viability indicator (Table 3), i.e. debt to income ratio, at the analysed Lithuanian farmers' farms, 98 % of the farms would be viable under Alternative 1, and97 % – under Alternative 2 of the model. The estimated indicator has suggested that 97 % of the analysed farms were viable in 2013, and only 87 % according to the same indicator not adjusted for subsidies. Thus, Alternative 1 of the model would lead to increase of the viable farms by 1 farm; while according to the indicator not adjusted for subsidies, the number of viable farms would grow under Alternatives 1 and 2.More detailed analysis of data in Table 4 has suggested that the share of very small viable farms would be maintained, while the share of mid-sized viable farms would increase by as many as 56 % in case of both Alternative

1 and Alternative 2. Economic viability of mid- and large-sized farms would be maintained, i.e. almost 100 % of these farms are viable under the both Alternatives, both adjusted and not adjusted for subsidies.

Table 3. Lithuanian farmers' farms by farm ES with debt to income ratio < 600 %, 2013

Farm size	Farm groups by ES	Number of viable farms with debt to income ratio < 600 %, 2013						Number of farms in group
		Adjusted for subsidies	Adjusted for subsidies, Altern. 1	Adjusted for subsidies, Altern. 2	Not adjusted for subsidies	Not adjusted for subsidies, Altern. 1	Not adjusted for subsidies, Altern. 2	
Very small	4 - 8	13	13	13	12	12	12	13
Small-sized	8 - 15	14	14	14	5	14	14	14
	15 -25	13	13	13	13	14	14	14
Mid-sized	25- 50	13	13	13	13	13	13	14
	50 - 100	14	14	14	14	14	14	14
Large-sized	100 - 250	10	11	10	10	11	11	11
	250 -500	11	11	11	11	11	11	11
	500 - 750	6	6	6	6	6	6	6
Total of farms		94	95	94	84	94	94	97
Inclusive of the share of viable farms, %		97	98	97	87	97	97	100

Direct payments to producers and dependency ratio calculated under Alternative 1 and Alternative 2 of the model at the analysed farmers' farms (Table 4) has shown minor change in the number of viable farms. The number of viable farms has remained the same under Alternative 1 for improvement of contributions, compared to the number of viable farms in 2013.

Table 4. Lithuanian farmers' farms by farm ES with direct payments to producers and dependency ratio < 20 %, 2013

Farm size	Farm groups by ES	Number of viable farms with direct payments to producers and dependency ratio < 20 %, 2013			Number of farms in group
		Adjusted for subsidies	Adjusted for subsidies, Altern. 1	Adjusted for subsidies, Altern. 2	
Very small	4 - 8	1	1	1	13
Small-sized	8 - 15	3	3	3	14
	15 -25	0	0	0	14
Mid-sized	25- 50	2	2	2	14
	50 - 100	3	4	4	14
Large-sized	100 - 250	4	4	4	11
	250 -500	6	5	7	11
	500 - 750	4	4	4	6
Total of farms		23	23	25	97
Inclusive of the share of viable farms, %		24	24	26	100

The two calculated viability indicators not adjusted for subsidies (expense and income ratio, date and income ratio) calculated at the analysed farm under each individual alternative have suggested that the alternatives would allow maintain and increase economic viability of small- and mid-sized farms. The number of viable farms would increase by 8 % in total, according to expense and income ratio not

adjusted for subsidies both under Alternative 1 and Alternative 2.The number of viable farms according to the debt and income ratio not adjusted for subsidies would increase by as many as 12 %.

Table 5. Lithuanian farmers' farms by farm ES with expense to income ratio < 80 %, 2013

Farm groups by ES	Number of farms with expense to income ratio < 80 %, 2013				Number of farms in group
	Viable farms	Viable farms, not adjusted for subsidies	Viable farms after contribution amendment in case 1	Viable farms after contribution amendment in case 2	
1	2	3	4	5	6
4 - 8	12	7	13	13	13
8 - 15	14	9	14	14	14
15 -25	14	6	14	14	14
25- 50	14	12	14	14	14
50 - 100	14	14	14	14	14
100 - 250	11	11	11	11	11
250 -500	10	11	11	11	11
500 - 750	7	6	6	6	6
Total of farms	96	76	97	97	97
Inclusive of the share of viable farms, %	98.97	78.35	100.00	100.00	100.00

Data presented in Table 5 have suggested that, if case 1 and case 2 of the model had been applied to farmers' farms in 2013 in order to improve taxation system in relation to social and healthcare insurance contributions paid by Lithuanian farmers' farms, 100 % of farms would have maintained viability, irrespective of the group. According to calculations of the same indicator at the analysed farms for the year 2013, almost 99 % of the farms have been determined as viable; however, if not adjusted for subsidies received by a farm, only 78 % of farmers' farms would be determined as viable.

According to another viability indicator (Table 6), i.e. debt to income ratio, at the analysed Lithuanian farmers' farms, 97.94 % of the farms would be viable in case 1 of the model, and 96.91 % in case 2 of the model. The estimated indicator has suggested that 96.91 % of the analysed farms were viable in 2013, and just 86.6 % according to the same indicator not adjusted for subsidies. Thus, case 1 of the model would lead to increase in the share of viable farms by almost 2 % points.

Table 6. Lithuanian farmers' farms by farm ES with debt to income ratio < 600 %, 2013

Farm groups by ES	Number of farms with debt to income ratio < 600 %, 2013				Number of farms in group
	Viable farms	Viable farms, not adjusted for subsidies	Viable farms after contribution amendment in case 1	Viable farms after contribution amendment in case 2	
4 - 8	13	12	13	13	13
8 - 15	14	5	14	14	14
15 -25	13	13	13	13	14
25- 50	13	13	13	13	14
50 - 100	14	14	14	14	14
100 - 250	10	10	11	10	11
250 -500	11	11	11	11	11
500 - 750	6	6	6	6	6
Total of farms	94	84	95	94	97

Inclusive of the share of viable farms, %	96.91	86.60	97.94	96.91	100,00

Direct payments to producers and dependency ratio calculated under case 1 and case 2 of the model at the analysed farmers' farms (Table 7) has shown minor change in the number of viable farms. Both in 2013, both in case 1 of the model, just 23.71 % of the farms have remained viable. On the other hand, the number of viable farms would increase by 2 % points in case 2 of the model.

Table 7. Lithuanian farmers' farms by farm ES with direct payments to producers and dependency ratio < 20 %, 2013

Farm groups by ES	Number of farms with direct payments to producers and dependency ratio < 20 %, 2013			Number of farms in group
	Viable farms	Viable farms after contribution amendment in case 1	Viable farms after contribution amendment in case 2	
4 - 8	1	1	1	13
8 - 15	3	3	3	14
15 -25	0	0	0	14
25- 50	2	2	2	14
50 - 100	3	4	4	14
100 - 250	4	4	4	11
250 -500	6	5	7	11
500 - 750	4	4	4	6
Total of farms	23	23	25	97
Inclusive of the share of viable farms, %	23.71	23.71	25.77	100.00

Assessment of the designed model for improvement of farmers' farm taxation has suggested that Alternative 1 on improvement of the personal income tax and Alternative 2 on improvement of the state social insurance and mandatory healthcare insurance contributions are the most appropriate in order to maintain and improve economic viability of farmers' farms.

Conclusions and implications

Analysis of scientific approaches towards the specifics of farmers' farm taxation has been conducted, and the following issues have been identified:
- farmers' farms are not capable of reducing the taxable income by the non-taxable amount of income, incurred life insurance, retirement savings, study expenses, which suggests that the personal income tax does not comply with the principle of fair taxation;
- unequal taxation treatment of farmers' farms caused by grouping them into 4 groups that are subject to different state social insurance and healthcare insurance contribution rates and different tax base;
- differentiation of farmers' farms by grouping them into 4 groups by economic size and VAT payer's status for taxation purposes increases complexity of the taxation system, does not satisfy the principles of taxation, leads to regressive nature of the system, increases tax burden on small- and mid-sized farms, and reduces tax burden on large-sized farms.

Model for improvement of farm taxation system comprised of three alternatives on improvement of the personal income tax and two alternatives on improvement of the state social insurance and mandatory healthcare insurance contributions. Actions performed in case of each alternative have also been indicated. The model is based on the practice in other countries and analysis of scientific approaches towards the subject.

Assessment of applicability of the model for improvement of farmers' farm taxation system in order to maintain and improve economic viability of farms has provided the following findings:
- application of alternative 1, 2, and personal income tax-based alternative would allow maintain economic viability of very small, small- and mid-sized farms;
- alternatives for improvement of social and healthcare insurance have been determined as beneficial in terms of maintenance and improvement of economic viability of small- and mid-sized farms. The number of viable farms would increase by 8 % in total, according to expense and income ratio not adjusted for subsidies both under Alternative 1 and Alternative 2. The number of viable farms according to the debt and income ratio not adjusted for subsidies would increase by as many as 12 %;
- alternative 1 on the personal income tax and Alternative 2 on improvement of state social security and mandatory healthcare security are proposed for improvement of farmer taxation in Lithuania.

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