



VALUE ADDED AS A MEASURE OF PRODUCTION EFFICIENCY OF FARMS IN LATVIA IN THE EU CONTEXT

Valda Bratka, Artūrs Prauliņš

Latvian State Institute of Agrarian Economics

Annotation

Efficient agricultural production is not only an essential prerequisite for successful development of rural territories and food processing industry but also an important factor in providing employment and stability of national economy. The creation of high value added by agrarian sector substantially contributes to the growth of economic prosperity of rural population. This study aims to explore the efficiency of Latvian agricultural production at micro (farm) level measured by value added in the context of selected EU member states. All the calculations were performed by the authors and were based on data for the years 2007-2013 which had been obtained from the public databases of Farm Accountancy Data Network and SUDAT. An examination of the proportion of farm net value added to annual work unit has revealed that the Baltic States still belong to the lowest ratio group compared with the EU average. Latvian field crops farms were in a particularly difficult economic situation. In comparison with the EU average, the ratio of farm net value added per 1 hectare of utilized agricultural area was the smallest in the EU. In Latvian dairy farms the ratio of farm net value added per 1 livestock unit to the EU average was much higher and achieved approximately 70 %. However, it still was not as high as for farms in neighbouring Baltic countries where the ratio was roughly the same as the EU average. Latvian farms also remained among the most heavily subsidized agricultural holdings in the EU. In agrarian sector the proportion of production subsidies in farm net value added was two times higher than the EU average. A growing dependence of farms on subsidies manifests deteriorating competitiveness of agrarian sector. This trend could be reversed by introducing innovative forms of production process, modernizing technology and learning from experience of other EU member states, particularly, of Scandinavian countries which have similar or even more adverse climate.

KEY WORDS: value added; farms; production efficiency; Latvia.

Introduction

Efficient agricultural production is not only an essential prerequisite for successful development of rural territories and food processing industry in Latvia and other EU member states but also an important factor in providing employment and stability of national economy (Svarinska 2008). The creation of high value added by agriculture substantially contributes to the growth of economic prosperity of rural population (Kilkenny et al. 2001). The Common Agricultural Policy of the EU (hereinafter - CAP) plays a major part in this process. To implement the CAP effectively the European Commission needs detailed statistical information on the economic situation in the agrarian sector. Statistical data on the income and production efficiency of farmers are of paramount importance because they shed light upon and provide an opportunity for monitoring the actual performance of the sector.

The study aims at exploring the efficiency of Latvian agricultural production at micro (farm) level measured by value added in the context of selected EU member states. The following research tasks have been formulated:

- 1) to outline the merits and drawbacks of value added as an economic indicator;
- 2) to examine the role played by subsidies in the efficiency of production at micro (farm) level;
- 3) to spot the position of Latvian farms across farms in selected EU member states with regard to production efficiency and the dependence on state support.

The object of research is value added as a measure of agricultural production in Latvia at micro (farm) level. To

accomplish the undertaken tasks several research methods such as monographic, systematic, statistical and logical abstraction have been employed.

In this study, an analysis of data for the years 2007-2013 has been carried out. Two main reasons have determined the choice of this time span. Firstly, it coincides with the period of the Rural Development Programme for Latvia (2007-2013) - the most important document which establishes the focus areas and top priorities of agricultural development and production. Secondly, most scholars (Špoģis et al. 2007; Vēveris et al. 2007; Buģina et al. 2008; Bratka et al. 2009; Vēveris 2009) based their analysis of value added of Latvian farms on data for the years preceding the given period. Therefore, the period under current study had not been explored. Although some papers (Bratka et al. 2010; Bratka et al. 2012) also used data for a few years following the year 2007, these papers focused solely on the comparison of value added between Latvian farms of different specialization without analysis in the context of the EU. Consequently, the novelty of this study is the examination of value added of Latvian farms during the years 2007-2013 in the context of other EU member states, filling the gap in literature and adding to the current body of knowledge. The selection of EU member states for comparison was determined by the availability of required data in a public database.

All the calculations were performed by the authors and were based on data obtained from the public databases of FADN (*Farm Accountancy Data Network*)¹ and SUDAT² (*Saimniecību uzskaites datu tīkls*). The latter is developed, maintained and updated by the Latvian State Institute of Agrarian Economics which is a national liaison agency for FADN in Latvia. Established in 1965, FADN is the EU system of sample annual surveys which are carried out by liaison agencies to monitor agricultural sector and to assess the impact of the CAP. Farms exceeding the threshold set for each member state participate in the survey aiming at a possibly comprehensive representation of agricultural output, area and labour force of market oriented holdings. FADN helps the European Commission to assess the economic situation at microeconomic level. This network successfully complements the Economic Accounts for Agriculture prepared within the framework of national accounts by Eurostat and give valuable insight into agricultural production from a macroeconomic perspective (Hill 1991).

Value added as a measure of production efficiency

Value added is a significant and widely spread measure of productivity and efficiency (Hedderwick 1988; Richard 1989; Riahi-Belkaoui 1996, 1999). Despite Christensen's (1975) opinion that the use of comprehensive measures based on such general ratios as output per worker or yield per 1 ha could yield misleading results, value added for several decades was used as a crucially important indicator of farm working efficiency (Hayami 1970; Borchert 1983). An increase in value added is considered a sign of innovative development both at enterprise and national economy level (Boland 2009). It is maintained that agriculture focused on creating high value added is more efficient in promoting sustainable development, raising the level of wellbeing and quality of life (Kilkenny 2001). Moreover, Nakamoto (1996) emphasizes the necessity to analyze the value added created exclusively by agricultural sector of national economy.

Historically, the contribution of agriculture was measured by net farm income³. When this approach was developed after the Second World War, farm operators and their families owned an overwhelming majority of production factors. Therefore, payments to suppliers of some factors were ascribed to production expenses. Over the years, the situation changed dramatically in large farms where a large proportion of land, labour force and capital were owned by non-owners of the business. Some

scholars highlighted this trend. For example, Schertz (1982) recognized an increasing heterogeneity in the structure, ownership and use of farm production factors and supported a new concept of separation of production factor owners and users which replaced a previous model of individually controlled farms. According to Poppe et.al. (2004), this process of increasing complexity of farming practices and relations in Western Europe is still underway.

Limited available information for statistical purposes was another reason for the growing popularity of value added. Between the years 1978 – 1982 'labour income per unit of labour' was considered the main income indicator within FADN framework. However, at initial stages of the development of FADN system some EU member states could not obtain reliable information about farmers' expenses on some production factors, especially interest payments (Hill 2012). As the calculation of labour income involved the deduction of costs for land and working capital, real or imputed, their validity was questioned and severely criticized by both the European Commission and independent experts (Hill 1991). Thus, there was urgent need for developing an alternative measure. As a result of a major revision of the range of FADN indicators in 1982, a new indicator – 'farm net value added' (FNVA) per holding and per annual work unit (AWU)⁴ - was introduced.

It is a more precise measure of the farm sector's total output because it better reflects the contribution of all production factors regardless of the form of ownership (Erickson et. al. 2002; Johnson et. al 2007, Vēveris 2009). FNVA shows benefits received by the owners of all the production factors such as land, capital, entrepreneurial skills and labour force which consists of paid hired and unpaid family labour inputs. Therefore, it is a "hybrid of rewards" (Hill 1991: 11) and gives analysts an opportunity to dissect it according to different classifications by function and ownership.

Doubtlessly, FNVA offered an optimal solution to the problem as its calculation did not require knowledge of a full set of expenses (Hill 2012). This new indicator replaced its predecessor 'labour income' and soon was acknowledged as one of the main measures of farm performance. At present, net value added is widely used as a fundamental concept of major income indicators in the agrarian sector both at aggregate (Eurostat) and enterprise (FADN) levels. Yet, FNVA does have a dark side too. It cannot be used as a proxy of the total income of farmers as it disregards other sources of income (Hill 1991).

Relative simplicity of FNVA is mentioned as its main advantage (EU Farm... 2013, 2014). Despite its obvious attractiveness, FNVA per holding suffers from serious drawbacks. This indicator might be useful for analyzing the concentration and structure of agricultural production as it shows the amount of value added created by farms of particular size. Nevertheless, interchangeable production factors are one of the main reasons for judging critically the use of this indicator for other purposes. Substitution

¹ http://ec.europa.eu/agriculture/ricaprod/database/database_en.cfm

² <https://sudat.lvaei.lv/Login.aspx?ReturnUrl=%2fdefault.aspx>

³ Froněk et al. (2007) have developed a scoring model for farms which consists of such variables as net income (profit/loss), value added, operational assets and investment. Despite widely held opinion of net income as a primary indicator of farm overall performance, it has been proved that value added outperforms net income and is more appropriate for classifying agricultural holdings according to their performance. However, the results of the study carried out by Chrastinova (2008) have revealed the correlation between value added and an economic performance of agricultural cooperatives. No such correlation was found in business agricultural holdings.

⁴ Annual work unit (AWU) is the work performed by a person who is occupied on a farm on a full-time basis. 1 AWU is equal to 1800 hours or 225 working days of 8 hours each.

of on-farm inputs for purchased inputs, for instance, family labour for purchased fuel or land for manufactured fertilizers, might result in similar final outputs and different FNVA. For this reason, FNVA per AWU seen as a measure of partial labour productivity (EU Farm... 2013, 2014) or per other single production factor such as agricultural land measured in hectares could be preferable indicators. However, their interpretation might be even more problematic and come under attack because FNVA is the result of using a mix of production factors instead of the result of any separate factor such as labour (annual work units), land (hectares) or capital. Consequently, the proportion of FNVA and any single factor is also questionable (Hill 1991).

Although definitions of the value added differ (Ekonomikas... 2000; Shim et.al. 2001; Black et.al. 2012), the algorithm of its calculation is similar. The United Nations System of National Accounts (System 2009), Farm Accountancy Data Network methodology (Lauku... 2008) and scholars (Hill 2012) suggest that the value added can be found as the difference between the value of farm output and the variable inputs purchased from other sectors of the economy after adjustment for changes in the stocks of products and inputs as well as subsidies and taxes on production. To calculate FNVA further adjustments for the consumption of capital (depreciation) should be made.

The ratio of FNVA to the consumption of labour is one of the most popular economic analytical indicators of farm labour efficiency, used by numerous scholars (Špoģis et al. 2007; Vēveris et al. 2007; Buģina et al. 2008; Sīrelečēk et al. 2009a; Vēveris 2009). Net value added is the industry level indicator. Thus, according to the interpretation of the purpose of Article 39 of the Treaty of Rome as relating to all people working in agriculture (employed, self-employed, and family help) no distinction between farmer's labour and hired labour is made when the ratio "FNVA per AWU" is calculated (Hill 2012). According to another explanation (Hill 1991), no distinction is made because the purpose of the CAP is to give benefits to everyone who is employed in the agrarian sector irrespective of their status. However, serious flaws are concealed because these explanations successfully mix sectors of hired and family labour whose principles of remuneration are completely different. While in the former reward is the only type of remuneration, in the latter it is the combination of various factors with diverse levels of risk.

The role of subsidies in agrarian sector

Recently, the issue of subsidies in general and agricultural subsidies in particular has assumed considerable significance and attracted a lot of attention of policy makers, scholars, analysts and farmers. Subsidies are a public financial contribution which is made to achieve a financial balance of a receiving organization without specifying the purpose (Sedlāček 2012). For Rutherford (2002), subsidy is a payment made by the government to a company or a household in order to reduce the cost of used labour or capital. Generally, agricultural subsidies play a crucial role in stimulating the development of any country by facilitating agricultural

production, employment and investment. In agriculture, subsidies are justified by the necessity of maintaining sustainable use of land, preserving the landscape and viable systems of agricultural production in less-favourable regions, and supporting rural population. Thus, Dibrova et al. (2009) make a valid point arguing that the need to support agrarian sector is determined by several factors including the particularities of agriculture as one of national economy sectors and its importance to food self-provision of the state as well as by the susceptibility of this sector both to adverse climate conditions and volatility of commodity markets. The rationale of subsidizing agriculture in developing countries stems from either stimulating agricultural development or protecting the meager incomes of some vulnerable cultivators, who may not have the risk bearing capacity. Nevertheless, in developed countries, usually subsidies to farmers are paid to keep them "in parity" with non-farming communities.

For V. Karpik (Karpik 2006), there are the following types of state support for agriculture: indirect support (preferential crediting, taxation, other indirect subsidies) and direct support (grants, favorable loans etc.). Gulati et. al. (1995) offer a different classification. First, the government can pay a much higher price for agricultural products compared with a price farmers are offered in free market. Second, vitally important inputs such as irrigation water, electricity, fuel, investments in assets can be subsidized. Of these two alternatives, the latter is normally preferred because it is believed that benefits of government expenditures can be derived by the farmers only proportionally to their use of inputs. It is also argued that incentives like subsidies are not supposed to be substitutes for long-term measures, for example, new agro-technology (Gulati et al. 1998). Consequently, subsidies on inputs are usually justified as temporary measures which could be withdrawn once the objectives have been achieved. But the past experience clearly shows that reduction in or cancellation of subsidies is an extremely difficult political decision.

A comparative analysis of value added in Latvia's context

Viira et al. (2011) have highlighted the importance of taking into consideration the subsidies to perform more detailed analysis of FNVA. As a result, production NVA, which is equal to FNVA minus production subsidies, can be calculated. In comparison with FNVA, production NVA provides a valuable and more realistic insight into the potential of farms to create additional value without any financial support from the state. Previously, production NVA of farms in Latvia has been analyzed by Špoģis et al. (2007). However, this measure is not the only one suggested by scholars. An alternative indicator for the analysis of dependence of farms on state support was proposed by Lososová (2013). It is a subsidy index, is equal to the ratio of costs to revenues after the deduction of subsidies.

During the period from 2007 to 2013 the highest FNVA per 1 AWU was created by fieldcrop and granivore farms whereas the lowest one - by mixed livestock and mixed cropping farms (Table 1 and 2). A

low proportion of production NVA definitely shows that farms of some specialization, namely, mixed livestock, mixed crops and livestock, fieldcrops and dairying, were able to generate FNVA mostly owing to state support received. In some years the situation was even more

unfavourable because subsidies exceeded FNVA and consequently resulted in a negative production NVA. In case of changes in agricultural policy or suspended support payments the farms which are excessively dependent on state support would bankrupt.

Table 1. FNVA and the proportion of production NVA in FNVA created by livestock farming and granivore farms in Latvia in 2007-2013 (LVL)

Type of farming	Ratio	2007	2008	2009	2010	2011	2012	2013	Average
Dairying	FNVA per 1 AWU	5225	4646	3720	4426	4676	4684	5079	4637
	Prod. NVA / FNVA	0,29	0,14	-0,20	0,13	0,23	0,22	0,24	0,15
Mixed livestock	FNVA per 1 AWU	3473	2779	2626	3038	3114	2751	3033	2973
	Prod. NVA / FNVA	0,26	-0,19	-0,08	0,08	-0,05	0,11	0,03	0,02
Mixed crops and livestock	FNVA per 1 AWU	4576	4290	3846	4460	5567	5476	4502	4674
	Prod. NVA / FNVA	0,32	0,11	-0,12	0,03	0,12	0,16	0,13	0,11
Granivores	FNVA per 1 AWU	7158	7764	10969	9157	7373	12250	17836	10358
	Prod. NVA / FNVA	0,60	0,58	0,82	0,59	0,45	0,55	0,55	0,59

Table 2. FNVA and the proportion of production NVA in FNVA created by crop farming and horticulture farms in Latvia in 2007-2013 (LVL)

Type of farming	Ratio	2007	2008	2009	2010	2011	2012	2013	Average
Fieldcrops	FNVA per 1 AWU	10837	10170	4448	7318	7824	13561	8073	8890
	Prod. NVA / FNVA	0,41	0,13	-0,60	-0,11	0,12	0,55	0,25	0,11
Mixed cropping	FNVA per 1 AWU	3299	3308	2858	2893	3046	4718	3941	3438
	Prod. NVA / FNVA	0,44	0,44	0,26	0,27	0,27	0,29	0,40	0,34
Horticulture	FNVA per 1 AWU	2561	2969	4134	5484	5375	5053	6088	4524
	Prod. NVA / FNVA	0,93	0,90	0,94	0,96	0,97	0,97	0,99	0,95
Permanent crops	FNVA per 1 AWU	4632	5421	3905	2530	3148	4406	4544	4084
	Prod. NVA / FNVA	0,58	0,67	0,48	-0,33	0,37	0,14	0,06	0,28

In addition to the measures shown in Tables 1 and 2, Špoģis et al. (2007) suggest that the proportion of FNVA in farm production income is also explored (Table 3).

Production income consists of the amount earned by farms themselves (total output) and the amount allocated by the state as support payments (production subsidies).

Table 3. The proportion of FNVA in farm production income in Latvia in 2007-2013 (in percent)

Type of farming	2007	2008	2009	2010	2011	2012	2013	Average
Dairying	33	28	27	29	28	27	27	28
Fieldcrops	36	30	18	24	23	32	23	27
Mixed livestock	34	26	29	31	26	28	31	29
Mixed crops and livestock	36	31	29	30	32	30	27	31
Mixed cropping	39	44	37	31	39	40	39	38
Horticulture	25	26	30	34	29	20	21	26
Permanent crops	55	50	52	28	38	35	35	42
Granivores	21	18	24	21	14	20	21	20

In the years 2007 – 2013 the highest percentage of FNVA was generated by farms whose specialization was permanent crops and mixed cropping while granivores showed the lowest one. However, these results should be interpreted cautiously. In contrast to production NVA, they do not give a direct answer to the question about farms' ability to operate without state support. Rather, these results provide an alternative perspective and describe FNVA in relation to the most important sources of farm revenues (output and production subsidies).

Consequently, it makes possible to bring another analytical dimension to the comparison of farms of different specialization.

A comparative analysis of value added in the EU context

Nowadays, the value added approach is accepted and used internationally. Data on value added provide additional information both on farms at microlevel and

the agricultural sector at macrolevel. This kind of data could also be used in microlevel analysis to find out the distributional implications of agricultural policy (Offutt 2002; Grznár et al. 2004). In addition, they give a useful insight into the organizational and operational structure of farms as revealed by stakeholder payments. Data on value added could be an important source of information for making comparisons both between farms with a different organizational and legal structure (family farms, limited companies, cooperatives etc.) and between countries with a different structure of farms (Johnson et al. 2007; Definitions... 2011).

In this study, the indicators of the value added of Latvian farms are analyzed in comparison with selected EU member states for which the necessary information

was available in the public FADN database. The results of the current study support earlier conclusions about significant disparities between FNVA across different members of the EU (EU Farm... 2013, 2014).

A comparative analysis of the proportion of FNVA to AWU (Table 4) shows that EU farms could be divided into three groups. Over the period of six years from 2007 to 2012 the majority of new member states (the Baltic States, Cyprus, Malta, Poland, Slovenia and Slovakia) and Greece and Portugal as old member states achieved the lowest ratio compared with the EU average. While farms in Austria, the Czech Republic and Hungary had approximately the same ratio as the EU average, the ratio in the remaining member states significantly exceeded the average level.

Table 4. The ratio of FNVA per annual work unit to the EU average in some EU member states in 2007-2012

Member state	2007	2009	2011	2012	Member state	2007	2009	2011	2012
BEL	2,80	2,41	2,07	2,27	LUX	2,65	1,76	2,21	1,86
CYP	0,59	0,66	0,60	0,49	LVA	0,52	0,45	0,41	0,51
CZE	0,90	0,83	1,06	1,04	MLT	0,85	0,54	0,32	0,39
DAN	3,98	3,21	4,69	5,16	NED	2,95	2,85	2,52	2,89
DEU	2,33	1,98	1,94	2,17	OST	1,57	1,38	1,28	1,19
ELL	0,88	0,89	0,68	0,64	POL	0,44	0,36	0,41	0,39
ESP	1,56	1,36	1,13	1,06	POR	0,50	0,64	0,51	0,50
EST	0,87	0,66	0,93	1,02	SUO	1,73	1,51	1,45	1,43
FRA	2,27	1,68	2,06	2,01	SVE	2,22	1,45	1,91	1,96
HUN	0,89	0,74	1,10	1,05	SVK	0,53	0,18	0,62	0,54
IRE	1,51	1,08	1,41	1,25	SVN	0,29	0,32	0,28	0,21
ITA	1,51	1,68	1,23	1,20	UKI	2,68	2,35	2,45	2,08
LTU	0,62	0,46	0,48	0,54	<i>EU average (EUR)</i>	<i>15165</i>	<i>13583</i>	<i>18203</i>	<i>18962</i>

However, Lal (1999) has pointed to some limitations as differences in national methodology for calculating value added could decrease an international comparability of results. Various depreciation rates used in different EU member states are a case in point (Bašek et al. 2011). Grznár et al. (2004) emphasize that value added depends not only on the efficient use of purchased inputs but also on climate and other natural conditions, quality of soil, management and the structure of production process in agricultural holdings. All of them might vary widely. For instance, Michaličková et al. (2014) has identified the influence of the farm structure on labour productivity. In most regions of Central and Eastern Europe the average size of farms is small, the level of mechanization is low and a significant part of output is used for consumption. The orientation of agricultural sector in Malta and Slovenia to less productive types of farming, namely mixed cropping and other permanent crops, has been mentioned as one of potential reasons for particularly low ratios (EU Farm... 2014).

The CAP aims to maintain or increase the total revenues of farms by using instruments such as direct payments within the first pillar and different types of subsidies within the second pillar of the CAP. In addition to influencing the total revenues, these instruments have a profound impact on the level of agricultural production and expenses, prices and structure of agrarian sector

(Malá et al. 2011). A number of scholars (Střeleček et al. 2003; Bielik et al. 2006; Hrabalová et al. 2006; Střeleček et al. 2010) have underlined the crucial role played by subsidies and the dependence of farms on them. In some countries this subsidy dependence becomes a universal phenomenon. For instance, Chrastinová et al. (2009) have reported that an average Czech farm is not able to make profit if no subsidies are received. Similarly, von Witzke et al. (2006) are deeply pessimistic and have concluded that without such type of subsidies as direct payments the majority of German agricultural holdings (legal entities) would run at a loss.

It is also stressed that different amounts of subsidies allocated to farms according to their type of farming could influence or even determine the type of farming because subsidizing stimulates the production of some agricultural commodities and suppresses the production of others. As a result, subsidies distort the production structure and diverge it from the pattern of demand. Thus, subsidies could simultaneously be the cause and the result of the type of farming. In addition, there is an opinion that a low proportion of subsidies in revenues could be devastating and undermine competitiveness because farms do not have enough financial resources to regularly renew and modernize assets (Střeleček et al. 2009b). Špička et al. (2009) show that production subsidies exercise direct influence on the amount of farm revenues and act as a 'financial cushion' reducing the volatility of

revenues. This mitigating factor is particularly important to crop farming, heavily dependent on weather conditions and, consequently, on volatile market prices.

On the whole, the proportion of subsidies in farm revenues in old EU member states was lower compared with the proportion in the new member states (EU Farm... 2014). Our calculations concur with this conclusion (Table 5).

Table 5. The proportion of production subsidies in FNVA created by farms in some EU member states in 2007-2012 (in percent)

Member state	2007	2009	2011	2012	Member state	2007	2009	2011	2012
BEL	28	36	31	28	LUX	63	109	75	80
CYP	33	35	24	36	LVA	68	113	89	67
CZE	61	101	65	64	MLT	45	35	34	28
DAN	36	48	26	22	NED	14	18	16	14
DEU	41	59	46	38	OST	51	75	55	57
ELL	38	45	46	47	POL	34	62	46	44
ESP	20	35	35	34	POR	44	47	44	45
EST	49	94	70	63	SUO	125	177	144	143
FRA	44	65	41	40	SVE	69	121	81	73
HUN	51	77	51	48	SVK	97	477	95	101
IRE	77	116	65	74	SVN	78	111	92	125
ITA	17	21	22	22	UKI	52	63	44	48
LTU	40	77	53	49	<i>EU average</i>	36	49	39	38

The agrarian sector was most heavily subsidized in Slovakia, Finland, Slovenia and Sweden. Almost 10 years ago scholars already emphasized the great dependence of Latvian farms on state support and found that the proportion of production subsidies in FNVA had been higher in comparison with the average level in other EU member states (Vēveris et al. 2007). The situation has not improved and the proportion of production subsidies in FNVA of Latvian farms is still two times higher than the EU average. It was also 5.5 times higher than in the Netherlands – a country with the smallest percentage of production subsidies in FNVA. This small percentage could be explained by the focus of Dutch agriculture on highly profitable and less supported sectors such as horticulture and granivores (EU Farm... 2014).

According to the data of the latest Census of Agriculture, conducted in Latvia in 2013, 46 % of all economically active farms were field crops farms and 16 % - dairy farms⁵. Therefore, these specializations are the most popular among agricultural holdings in Latvia and have been chosen by authors for a further detailed analysis of FNVA indicators.

The ratio of FNVA per 1 hectare of utilized agricultural area (Bašek et al. 2011) and the ratio of value added per 1 hectare of utilized agricultural area (Trnková et al. 2012) are a popular alternative to a common ratio of FNVA per 1 AWU. In comparison with the EU average, the ratio of FNVA per 1 hectare of utilized agricultural area in the Baltic States was the lowest in the EU (Table 6).

Among the Baltic States Latvia yielded the worst results. The results achieved by an overwhelming majority of other new member states were much more

positive. For example, the ratio for Slovenian farms was about 1.5 times higher than the EU average whereas for Polish farms it was approximately 80 % of the EU average. Even the ratio for Finnish field crops farms was higher than that for the Baltic States despite a well-known fact that in this northern Scandinavian country adverse climate conditions might transform an agricultural production process into an arduous task.

Contrary to the situation in field crops farms, the ratio of FNVA per 1 livestock unit to the EU average in Latvian dairy farms was considerably higher and achieved approximately 70 % (Table 7). Although it was a much better result than in Malta and Slovakia, this ratio still was not as high as for farms in neighbouring Baltic countries where the ratio was roughly the same as the EU average. Belgian, German and Danish farms reached similar results. Miglavs et al. (2007) maintain that the highly fragmented structure of Latvian milk producing farms is one of the main reasons for a relatively low FNVA in the dairy sector. The increase in its concentration and specialization could have a positive influence on the growth of FNVA (Krieviņa 2009). Another proposal is the introduction of employees' motivation schemes which might help achieve a higher labour productivity (Michaličková et al. 2013).

Conclusions

Value added has been recognized as a significant and widespread measure of productivity and efficiency. Its increase is considered a sign of innovative development both at enterprise and national economy level. Although historically the contribution of agriculture was measured by net farm income, a continuous increase in the proportion of land, labour force and capital owned by non-owners of the business as well as limitations of

⁵ http://data.csb.gov.lv/pxweb/lv/lauks/lauks_ikgad_laukstrukt_13_visp/LSS13_107.px/?rxid=cdb978c-22b0-416a-aacc-aa650d3e2ce0

available information for statistical purposes were the main reason for the rising popularity of value added as an

alternative measure. Farm net value added is one of economic indicators derived from value added.

Table 6. The ratio of FNVA per 1 ha of utilized agricultural area to the EU average in field crops farms in some EU member states in 2007 – 2012

Member state	2007	2009	2011	2012	Member state	2007	2009	2011	2012
BEL	1,90	2,13	1,91	2,12	LVA	0,36	0,26	0,25	0,42
CZE	0,62	0,60	0,75	0,73	MLT	5,46	5,07	4,68	3,28
DAN	1,39	1,63	2,19	2,46	NED	3,02	4,54	2,48	3,98
DEU	1,08	1,24	1,09	1,40	OST	1,37	1,42	1,63	1,45
ESP	0,81	0,77	0,74	0,63	POL	0,80	0,76	0,81	0,84
EST	0,43	0,21	0,33	0,39	POR	0,71	1,46	0,92	1,06
FRA	1,07	0,82	1,13	1,21	SUO	0,68	0,30	0,45	0,41
HUN	0,56	0,55	0,83	0,74	SVE	0,84	0,53	0,79	0,80
IRE	1,60	0,87	1,22	0,92	SVK	0,43	0,15	0,59	0,51
ITA	2,03	2,36	1,69	1,50	SVN	1,58	2,71	1,10	0,79
LTU	0,57	0,40	0,44	0,56	UKI	1,05	0,97	1,07	1,01

Table 7. The ratio of FNVA per 1 livestock unit to the EU average in dairy farms in some EU member states in 2007 – 2012

Member state	2007	2009	2011	2012	Member state	2007	2009	2011	2012
BEL	1,18	1,03	0,96	0,86	LVA	0,67	0,73	0,63	0,73
CZE	0,87	1,07	1,22	1,40	MLT	0,52	0,52	0,46	0,53
DAN	1,16	0,74	1,08	1,12	NED	1,25	0,95	1,24	1,22
DEU	1,15	1,05	0,95	1,02	OST	1,50	1,73	1,42	1,46
ESP	1,38	1,43	0,91	0,78	POL	0,88	0,71	0,96	0,91
EST	0,96	0,87	1,02	1,07	POR	0,74	1,09	0,77	0,85
FRA	0,73	0,64	0,79	0,78	SUO	1,34	2,01	1,40	1,76
HUN	0,89	1,03	1,34	1,39	SVE	0,86	0,80	0,97	0,87
IRE	0,79	0,63	0,90	0,75	SVK	0,56	0,18	0,46	0,71
ITA	1,41	2,03	1,62	1,67	SVN	0,70	0,79	0,65	0,70
LTU	0,88	0,95	0,88	0,88	UKI	0,76	0,81	0,77	0,71

It is a more precise measure of the farm sector's total output because it better reflects the contribution of all production factors regardless of the form of ownership. However, FNVA cannot be used as a proxy of the total income of farmers as it disregards other sources of income.

Generally, agricultural subsidies play a crucial role in stimulating the development of any country by facilitating agricultural production, employment and investment. In agriculture, subsidies are justified by the necessity of maintaining the sustainable use of land, preserving the landscape and viable systems of agricultural production in less-favourable regions, and supporting rural population. In addition to influencing the total revenues, subsidies have a profound impact on the level of agricultural production and expenses, prices and structure of agrarian sector because they stimulate the production of some agricultural commodities and suppress the production of others. As a result, subsidies distort the production structure and diverge it from the pattern of demand. In some countries the dependence of farms on subsidies becomes a universal phenomenon.

A comparison of Latvia and the EU member states by Vēveris et al. (2007) revealed that Latvia could be ranked among countries with the highest intermediate consumption and a low level of production efficiency (value added per AWU). Although almost 10 years have passed since this comparison was made, the results of this study show that the situation has not improved.

An examination of the proportion of FNVA to AWU shows that the Baltic States still belonged to the group of member states with the lowest ratio compared with the EU average. Field crops farms were in a particularly difficult economic situation. In comparison to the EU average, the ratio of FNVA per 1 hectare of utilized agricultural area in the Baltic States was the lowest in the EU. From among the Baltic States Latvia yielded the worst results. Unlike the poor results obtained by field crops farms, the ratio of FNVA per 1 livestock unit to the EU average in Latvian dairy farms was much higher and achieved approximately 70 %. Although it was a better result than that of Malta and Slovakia, this ratio still was lower for farms in neighbouring Baltic countries where the ratio was roughly the same as the EU average. Latvian farms remained among the most heavily subsidized

agricultural holdings in the EU. In Latvian agrarian sector the proportion of production subsidies in FNVA was still two times higher than the EU average. Moreover, it was also 5.5 times higher than in the Netherlands – a country with the smallest percentage of production subsidies in FNVA.

In Latvia over the period from 2007 to 2013 the highest FNVA per 1 AWU was created by fieldcrop and granivore farms while the lowest was created by mixed livestock and mixed cropping farms. A low proportion of production NVA undoubtedly points out that farms of some specialization, namely, mixed livestock, mixed crops and livestock, fieldcrops and dairying, were able to generate FNVA mostly owing to received state support.

If in the first years after the accession of Latvia to the EU there were relatively low wages and land costs, their continuous growth is believed to undermine the competitiveness of agricultural production in Latvia in the future. Thus, Ševčíková (2003) is right about disparity in input and output prices as another reason for declining value added in agricultural sector. A lack of modern technologies is also posed as an important problem. Although the implementation of SAPARD program helped to modernize agriculture and related food processing sectors, the growth of production efficiency was not sufficient to achieve even the EU average (Vēveris et al. 2007). Moreover, sometimes resources were spent without maximizing their potential contribution to the growth of production efficiency in agriculture (Vēveris 2009).

In a market economy a growing dependence of farms on subsidies manifests deteriorating competitiveness of agrarian sector. Farms could reverse this trend and increase production NVA by introducing innovative forms of production process, modernizing technology and using the experience of other EU member states, particularly, of Scandinavian countries with their similar or even harsher climate. In practice, the following actions at micro- and macroeconomic level might be taken.

Small farms merge and establish cooperatives.

A flexible system of taxation is created and special tax allowances are granted to those farms which operate in priority fields of agrarian sector.

Additional financial resources are allocated for further modernization and renovation of farm production equipment.

The system of leasing of agricultural equipment is improved and state guarantee to promote the investment attractiveness of agrarian sector is provided.

A further reduction of administrative burden and adoption of new approaches to entrepreneurship and human resources management based on the principles of knowledge society.

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VALUE ADDED AS A MEASURE OF PRODUCTION EFFICIENCY OF FARMS IN LATVIA IN THE EU CONTEXT

Summary

This study aims at exploring the efficiency of Latvian agricultural production at micro (farm) level measured by value added in the context of selected EU member states. All the calculations were performed by the authors and were based on data for the years 2007-2013 obtained from the public databases of Farm Accountancy Data Network and SUDAT (*Saimniecību uzskaites datu tīkls*).

Value added is a significant and widespread measure of productivity and efficiency. Although historically the contribution of agriculture was measured by net farm income, a continuous increase in the proportion of land, labour force and capital owned by non-owners of the business as well as limited available information for statistical purposes were the main reason for the rising popularity of value added as an alternative measure. Farm net value added is one of economic indicators derived from value added. It is a more precise measure of the farm sector's total output because it better reflects the contribution of all production factors regardless of the form of ownership. Nevertheless, FNVA cannot be used as a proxy of the total income of farmers as it disregards other sources of income.

Generally, agricultural subsidies play a crucial role in stimulating the development of any country by facilitating agricultural production, employment and investment. In addition to influencing the total revenues, subsidies have a profound impact on the level of agricultural production and expenses, prices and structure of agrarian sector because they stimulate the production of some agricultural commodities and suppress the production of others. As a result, subsidies distort the production structure and diverge it from the pattern of demand. In some countries the dependence of farms on subsidies becomes a universal phenomenon.

An examination of the proportion of FNVA to AWU showed that the Baltic States still belong to the group of member states with the lowest ratio compared with the EU average. Field crops farms were in a particularly difficult economic situation. In comparison with the EU average, the ratio of FNVA per 1 hectare of utilized agricultural area in the Baltic States was the lowest in the EU. Among the Baltic States Latvia yielded the worst results. Unlike to the poor results obtained by field crops farms, the ratio of FNVA per 1 livestock unit to the EU average in Latvian dairy farms was much higher and achieved approximately 70 %. However, this ratio still was not as high as for farms in neighbouring Baltic countries where the ratio was roughly the same as the EU average. Latvian farms remained among the most heavily subsidized agricultural holdings in the EU. In the agrarian sector the proportion of production subsidies in FNVA was two times higher than the EU average.

In Latvia, over the period from 2007 to 2013 the highest FNVA per 1 AWU was created by fieldcrop and granivore farms. The lowest one was by mixed livestock and mixed cropping farms. A low proportion of production NVA definitely shows that farms of some specialization, namely, mixed livestock, mixed crops and livestock, fieldcrops and dairying, were able to generate FNVA mostly owing to state support received.

In a market economy a growing dependence of farms on subsidies manifests deteriorating competitiveness of agrarian sector. Farms could reverse this trend and increase production NVA by introducing innovative forms of production process, modernizing technology and using the experience of other EU member states, particularly, of Scandinavian countries with their similar or even harsher climate. In practice, numerous actions at micro- and macroeconomic level might be taken. For instance, the establishment of cooperatives, the creation of agriculture-friendly system of taxation and a further reduction in administrative burden, the allocation of additional financial resources to farms for renovation, an improved system of leasing of agricultural equipment, the adoption of new approaches based on the principles of knowledge society.

KEY WORDS: value added, farms, production efficiency, Latvia.

Artūrs Prauliņš, *Dr. oec.*, researcher at the Department of Agribusiness Information and Analysis, Latvian State Institute of Agrarian Economics. Scientific interests: financial and management accounting, analysis of farm performance, microeconomic analysis. Address: Struktoru Street 14, Riga, LV-1039, Latvia. Phone: (371) 67552786; fax: (371) 67541789; e-mail: arturs@lvaei.lv.

Valda Bratka, *Dr. oec.*, leading researcher, Head of the Department of Agribusiness Information and Analysis, Latvian State Institute of Agrarian Economics. Scientific interests: agrarian economics, econometrics, microeconomics. Address: Struktoru Street 14, Riga, LV-1039, Latvia. Phone: (371) 67167909; fax: (371) 67541789; e-mail: valda.bratka@lvaei.lv.