

# EVALUATION OF SUPPORTED INVESTMENT IN LATVIAN FARMS EFFICIENCY

**Ilze Upīte**

*Latvia University of Agriculture*

Investment support is aimed at attracting investments to agriculture. Although an extensive use of investment support is subject to criticism, it accounts for a great deal of support for producers in the EU countries. In 2002–2008, the investment support for Latvian farm modernisation co-financed by the EU investment programs amounted to LVL82.5 million. The amounts allocated for this type of support account for 30–40% of the total funding for structural measures under EU support programs. In view of the extensive support amount, it is all-important to evaluate the efficiency of supported investment. An evaluation was performed for a group of 324 Latvian farms representing rural enterprises from all Latvian regions. As a result of the research, an increase in the efficiency of supported investment was identified – owing to an increase in the farm sizes and performance efficiency; on the other hand, investments were recognised as a risk factor, which has a negative impact on the farm viability indicators.

**Key words:** *investments, investment support, efficiency of supported investment, investment profitability, return on investment*

**JEL Classification:** *Q18*

## Introduction

In the national economy the role of agriculture has undergone significant changes from a primary sector in agrarian countries in the past to an industry with a relatively small number of employees and a share in gross domestic product nowadays. The specific nature and particular conditions of agricultural industry are the main arguments in justifying different types of governmental intervention and protectionism aimed at market stabilisation. In the light of economic development, protectionism policies are not limited to imposing import tariffs and quotas in order to protect the domestic market. Any supportive, financial, administrative, and other measures strengthening the competitiveness of domestic enterprises can be regarded as protectionism.

The purpose of investment support as a measure of agricultural protectionism is to attract investments to the industry of agriculture. Investments in technologies are necessary to ensure an intensive growth of the whole country and its industries and to increase the return on resources. Investment support or input subsidies are a measure of agricultural support which triggers contradictory discussions. According to the latest studies on agricultural policies, the extensive use of investment support is subject to criticism, regarding this type of support as inefficient in increasing incomes of farms (Ash, 2005). However, the significance of this type of support is indicated by the sizable funding allocated for investment

support and by its share in the agricultural support structure in various countries, especially in the EU. In 2006–2008, the input subsidies related to producing particular agricultural commodities and the investment support accounted for 56% of the total producer support in the countries of the Organisation for Economic Cooperation and Development (OECD). The most extensive use of input subsidies was observed in the EU states, the USA, and Switzerland. In 2006–2008, they accounted for approximately 50% of the total producer support in those countries (OECD, 2009).

In Latvia, which is a member state of the European Union, support measures, including investment support, are implemented in accordance with the EU Common Agricultural Policy. In 2002–2008, Latvian farms received investment support of nearly LVL 82.5 million for farm modernisation under support programs co-financed by the EU (it accounts for 65% of the total investment support for farm modernisation in Latvia in 1997–2008). As a result of this support, investments in Latvian farms amounted to LVL 295.8 million. The largest amounts were allocated for purchasing machinery (Upīte, Rukmanis, 2009). The important role of this investment support is evidenced by the fact that it was given 30–40% of all the funds (SAPARD, Structural Funds in 2004–2006, and Rural Development Program 2007–2013) allocated for structural changes in agriculture and fisheries under support programs co-financed by the EU.

The investment support amounts available for Latvian agriculture and their impact on the growth of the industry have been analysed by several Latvian scientists and economists. I. Geipele, K. Fedotova (2007) emphasise the development of agricultural output and processing as the key objectives of the national economy. Investments into enterprise modernisation and reconstruc-

---

**Ilze Upīte**, Mg. Oec.

**Fields of scientific interest:** support payments for rural economy

**Mailing address:** Faculty of Economics, Latvia University of Agriculture, Svetes Street 18, Jelgava, Latvia, Zip code LV-3001, ph. +37129448808, e-mail: ilze.upite@llu.lv

tion of production premises increase the productivity of the industry and contribute to sustainable development within the regions. A. Vēveris et al (2007) revealed a substantial increase in the investment support for agriculture and processing of agricultural products, which is related to the availability of EU funds. Consequently, this led to an increase in the production efficiency and the competitiveness of the sector.

Several authors conclude that the largest share of investment support has been received by the most economically active farms. Before joining the EU, the funds of SAPARD and other sources were concentrated in the largest Latvian farms (Vēveris, Krieviņa, 2006). The concentration of investment support in the most economically active regions was established by G. Mazūre (2004). According to a research conducted by K. Špoģis and A. Radžele (2007) using SUDAT farm data broken down by economic size, both a larger proportion of investment subsidies in the total subsidy volume (approximately 30–50%) and the largest amount of investment subsidies per 1 ha of agricultural land were observed in the largest farms. An extensive contribution to the evaluation of efficiency of supported investment was made by D. Saktiņa and W. H. Meyers (2005), who concluded that the investment support funding concentrates in certain territories and agricultural sectors of the country.

The use of investment support will be regarded as efficient as long as the supported investments are efficient. Therefore, the **research aim** is to evaluate the efficiency of supported investment and to work out the best ways of granting this type of support by evaluating the efficiency of supported investments in modernising Latvian farms. To achieve this aim, the following **research tasks** have been put forward:

- To determine the efficiency of supported investments for farms broken down by area of agricultural land;
- To determine the efficiency of supported investments for farms broken down by turnover.

### Materials and Methods

To evaluate the efficiency of supported investment, Latvian farm data are analysed. There is a total of 804 farms that have received investment support under SAPARD measure 1.1. “Modernisation of agricultural machinery, equipment, and construction of buildings”. Information for 2002–2007 is available for the evaluation of performance indicators in those farms. The sample size is determined using a simple random sampling formula (Kraštinš, Ciemiņa, 2003):

$$n = \frac{t^2 N v (1-v)}{t^2 v (1-v) + \Delta_v^2 N}, \quad (1)$$

where  $n$  – sample size,

$N$  – entire population size,

$v$  – relative frequency assumption 0.5,

$t$  – probability coefficient 1.96 (with 95% probability),

$\Delta_v^2$  – square error of relative frequency 0.0025.

According to the formula, a sample size should be at least 260 farms. In the present research, financial indicators of 324 farms have been compiled and analysed. The information was obtained from an investment support project database submitted to the Rural Support Service (RSS) and from financial reports of farms after they received funding in 2002–2007.

To evaluate several indicators characterising the investment efficiency, information on all the investment support projects was processed. In 2002–2008, a total number of 3488 projects were submitted to the RSS seeking to attract EU co-funding under the SAPARD program, the Single Programming Document 2004–2006 (SPD), and the Rural Development Program 2007–2013 (RDP).

To evaluate the use of investment support from the regional perspective, the territorial division of Latvia into nine regions, which was elaborated by the RSS, was used:

1. Eastern Latgale (EL – Rēzekne, Ludza districts);
2. Southern Kurzeme (SK – Saldus, Kuldīga, Liepāja districts);
3. Southern Latgale (SL – Preiļi, Daugavpils, Krāslava districts);
4. Lielrīga (LRG – Ogre, Rīga, Aizkraukle districts);
5. Central Latvia (CL – Jēkabpils, Madona districts);
6. Zemgale (ZE – Jelgava, Dobele, Bauska districts);
7. Northeastern Region (NE – Gulbene, Balvi, Alūksne districts);
8. Northern Kurzeme (NK – Talsi, Tukums, Ventpils districts);
9. Northern Vidzeme (NV – Valmiera, Cēsis, Limbaži, Valka districts).

### Evaluation Result and Discussion

The quantitative and qualitative characteristics of the sampled farms are shown in Table 1.

The average agricultural area of the sampled farms substantially exceeds average farm indicators in Latvia. In 59% of the sampled farms the agricultural areas were larger than 200 ha. The net annual turnover of 68% of the sampled farms exceeded LVL 200 per 1 ha of agricultural land. Among all the farm groups, the correlation coefficient between turnover and profit ranges between 0.8 and 0.9, indicating a positive correlation between these variables.

**Table 1.** Description of the selected farms

Regions/ Criteria	EL	SK	SL	LRG	CL	NE	ZE	NK	NV	Total	
Number of enterprises	8	28	19	39	15	20	99	36	60	324	
Percentage of given size enterprises	under 50 ha	-	3.6	10.5	5.1	33.3	5.0	3.0	5.6	8.3	6.5
	50-100 ha	-	3.6	10.5	15.4	6.7	-	6.1	13.9	8.3	8.0
	100-200 ha	25.0	32.1	26.3	23.1	26.7	20.0	24.2	19.4	36.7	26.5
	200-500 ha	12.5	39.3	21.1	20.5	26.7	45.0	28.3	38.9	23.3	28.7
	500-1000 ha	25.0	14.3	26.3	25.6	6.7	20.0	22.2	8.3	13.3	18.2
over 1000 ha	37.5	7.1	5.3	10.3	-	10.0	16.2	13.9	10.0	12.0	
Percentage of enterprises with over 200 ha	75	61	53	56	33	75	67	61	47	59	
Percentage of enterprises with given turnover per ha	under 100 LVL/ha <sup>-1</sup>	-	10.7	26.3	2.6	13.3	10.0	-	-	3.3	4.6
	100-200 LVL/ha <sup>-1</sup>	25.0	42.9	36.8	23.1	20.0	50.0	11.1	55.6	25.0	27.5
	200-500 LVL/ha <sup>-1</sup>	62.5	39.3	31.6	35.9	53.3	40.0	70.7	38.9	53.3	51.9
	500-1000 LVL/ha <sup>-1</sup>	-	3.6	-	23.1	-	-	15.2	2.8	13.3	10.5
	over 1000 LVL/ha <sup>-1</sup>	12.5	3.6	5.3	15.4	13.3	-	3.0	2.8	5.0	5.6
Percentage of enterprises with a turnover exceeding 200 LVL per 1 ha of agricultural land	75	46	37	74	67	40	89	44	72	68	

Source: author's estimates according to RSS data on projects and reports

Efficiency is the ratio of output results to resources expended in producing them. The efficiency of supported investment is evaluated using generally accepted investment efficiency indicators: return on investment and investment profitability. In the calculations, the annual net turnover and profit are divided by the value of investments employing investment support in the sampled farms in any particular year. Subsequently, the sampled farms are grouped by different indicators (agricultural land area, turnover per 1 ha) and the average return on investment and profitability are calculated for those farm groups.

The indicator of return on investment shows the amount of net turnover per 1 lat of investment. The higher this indicator, the more efficient is the use of investments at an enterprise. Investment management is considered to be efficient if in the analysed period the turnover or profit increase rate exceeds the investment increase rate. The profit to investment ratio shows the amount of profit per 1 lat of investment. Investments are effective only where the profit to investment ratio exceeds the inflation rate (Rurāne, 2005, 2007, Zvirbule-Bērziņa, et al, 2004, Rozentāle, 2008).

The analysis of the data provided in the table shows that in all groups of the sampled farms the profit to investment ratio substantially exceeds the inflation rate or the price index. The largest number of investment projects were implemented in 2003 through 2005, therefore, a lower profit to investment ratio is observed in this period.

**Table 2.** Investment profitability ratios for the groups of sampled farms in 2002–2007, %

Year	Investment profitability ratio, %		Inflation rate, %
	Grouped by area of agricultural land	Grouped by turnover per 1 ha of agricultural land	
2002	70.6	59.2	1.9
2003	39.8	58.2	2.9
2004	78.3	68.4	6.2
2005	77.3	97.5	6.7
2006	65.5	127.7	6.5
2007	77.1	151.1	10.1

Source: author's estimates according to RSS data on projects and CSB information

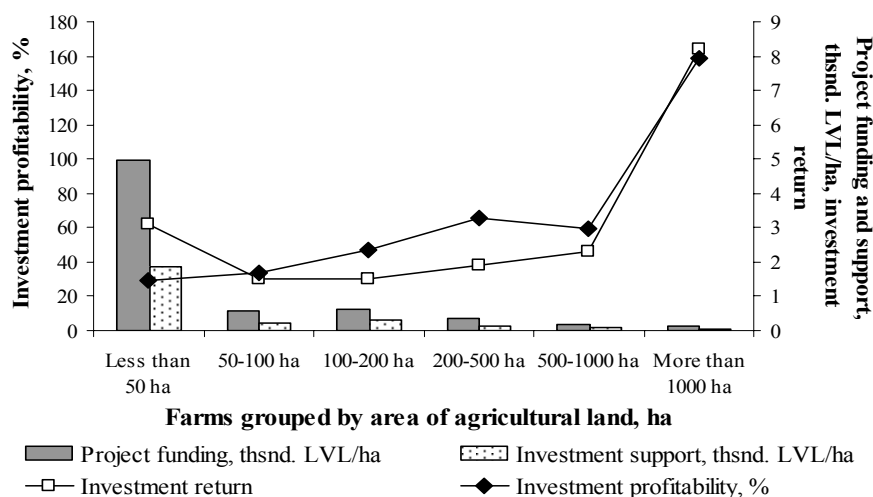
Following an analysis of SUDAT farm data for the period 2004 through 2006, I. Jakušonoka, et al (2008) conclude that an increase in the economic size of farms leads to a significant decline in the paying capacity and liquidity indicators. Another research on the efficiency of long-term investments conducted by S. Rozentāle (2008) finds that an increase in the investment volumes produces a decrease in the return on investment and investment profitability ratios. Furthermore, the research implies that investments in farm competitiveness tend to cut down farm viability indicators (investments generate bigger capital asset depreciation expenses, interest on loans obligations, and other costs related to project implementation). However, project implementation benefits (lower costs, higher incomes) are usually observed after a certain period of time. Therefore, competitive farms should seek a vital balance between in-

vestments into their technological modernisation and generally accepted norms of their viability.

The use of investments and support is defined by project funding amounts (investment amount) and investment support attracted by the farms. However, the efficiency of supported investment is measured by their amount per 1 ha of agricultural land. The indicators of the

farm turnover and profit per 1 ha of agricultural land indicate the efficiency of farm performance more objectively than the absolute values of those indicators.

Table 3 shows the amounts of project funding (investments) and investment support per 1 ha of agricultural land for all the farms that received investment support under three programs co-financed by the EU (3488 projects).



Source: author's research and construction according to RSS data on projects

**Fig.1.** Indicators of investment efficiency for the selected farms grouped by area of agricultural land in Latvia, 2002–2007

The group of farms with less than 50 ha cannot be equitably compared with other farms groups (see Fig. 1 and Table 3). This group is represented by large poultry and pig farms with small size agricultural land areas, which is why their performance results per 1 ha of agricultural land are considerably better. The specific features of large poultry and pig farms are similar to industrial production and in most cases they are not related to the employment of agricultural land.

Researches performed by several authors conclude that investment support tends to concentrate in the most economically active Latvian regions and farms with large

areas of agricultural land (Mazūre, 2004, Saktiņa, Meyers, 2005, Vēveris, Krieviņa, 2006, Špoģis, Radzele, 2007, Upīte, Rukmanis, 2009). The analysis of indicators characterising the investment efficiency reveals an opposite trend – an increase in the farm size leads to a dramatic fall in the project funding amounts (investments) and support per 1 ha of agricultural land. In the group of farms with over 1000 ha, the project funding amount and support per 1 ha of agricultural land is approximately 10, 7, and 3.5 times smaller than that in the group of farms with a size of 50–100 ha under the SAPARD program, the SPD, and the RDP, respectively (see Table 3).

**Table 3.** Project funding and investment support for Latvian farms grouped by the area of agricultural land in 2002-2008, LVL per 1 ha of agricultural land

Farm size	SAPARD		SPD		RDP	
	Project funding (investments)	Support	Project funding (investments)	Support	Project funding (investments)	Support
under 50 ha	10778	4041	16958	7498	12144	4524
50-100 ha	732	308	930	376	412	152
100-200 ha	336	143	486	234	325	111
200-500 ha	216	90	331	162	249	78
500-1000 ha	137	58	222	108	182	51
over 1000 ha	68	29	128	58	132	35

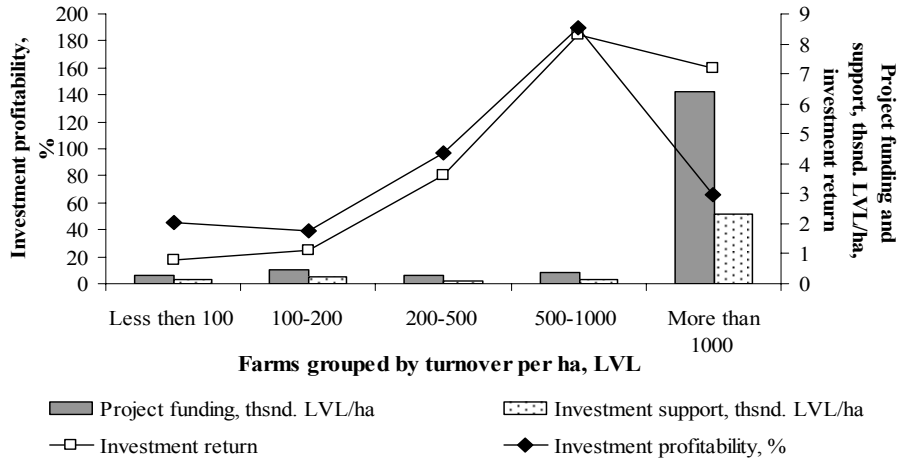
Source: author's estimates according to RSS data on projects

The amount of project funding and support per 1 ha of agricultural land in the group of sampled farms with

more than 1000 ha is approximately 5 times smaller than that in the group of farms with 50–100 ha. However, the

return on investment and profitability ratios are much higher in the group of farms with more than 1000 ha (see Fig.1). It can be concluded that the efficiency of supported investment in the farms has a positive correlation with the size of agricultural land.

Fig. 2 presents the indicators characterising the efficiency of supported investment in the farm groups broken down by turnover.



Source: author's research and construction according to RSS data on projects

Fig. 2. Indicators of investment efficiency in the selected Latvian farms grouped by turnover per 1 ha of agricultural land, 2002–2007

The analysis of the performance indicators of those farm groups allows to find correlations between the enterprise performance efficiency (turnover and profit indicators per 1 ha of agricultural land) and the efficiency of supported investment.

Intensive poultry and pig farms with small-size agricultural land plots have reached much better indicators in project funding (investments) and support per 1 ha of agricultural land (a farm group with a net turnover over LVL 1000). However, the profit to investment ratio of those farms is equal to that of the farms with a turnover of LVL 200-500 per 1 ha of agricultural land. The indicators of project funding (investments) and support per 1 ha of agricultural land are quite similar in all the other farm groups. In the farms with the largest turnover, the profit increase rate falls behind the turnover increase rate – it is evidenced by a decrease in the profitability ratio compared to the return on investment ratio.

Generally, significantly higher rates of return on investment and profitability are observed in the farms with higher performance efficiency (larger turnover per 1 ha of agricultural land). Therefore it can be concluded that farms with higher performance efficiency use investments in a more efficient way.

## Conclusions

To evaluate the efficiency of supported investment, the analysis was performed and the following conclusions were drawn:

- a high rate of investment profitability is characteristic of all the groups of the sampled farms, which exceeds the rate of inflation several times for the period of research (2002–2007);
- the supported investment were identified as a risk factor in terms of the farm viability: the rates of return on investment and profitability are lower during the periods when the largest investments are made (2003–2005). Therefore, farms should seek a relevant balance between investments in their technological modernisation and the generally accepted viability standards;
- the indicators of project funding (investments) and support per 1 ha of agricultural land depend on the farm performance intensity and the agricultural land size. An increase in the farm agricultural land size leads to a decrease in the amounts of project funding (investments) and support per 1 ha of agricultural land;
- a substantial rise in the investment efficiency indicators results from an increase in the farm size and efficiency. Consequently it can be concluded that an increase in the efficiency of investment support can be achieved by granting this support to large farms in terms of their area and turnover per 1 ha of agricultural land.

## References

1. OECD (2009). Agricultural Policies in OECD Countries: Monitoring and Evaluation. Available at: <http://www.oecd.org/dataoecd/37/16/43239979.pdf>
2. Ash K. (2005). Agricultural Policies in OECD Countries: A Positive Reform Agenda OECD. 40 p. Available at

- <http://www.adb.org/Documents/events/2005/atd/paper-ash.pdf>
3. Auziņa A., Dobeļe A., Mihejeva L., Upīte I. (2000). Praktiskums lauksaimnieciskajā komercdarbībā. Izdevumu sērija „Lauku uzņēmējs”, Rīga: KIF „Biznesa Komplekss”, 168 lpp.
  4. Geipele I., Fedotova K. (2007). The Competitiveness of Businesses in the Latvian Countryside: Ways to Enhance. International Scientific Conference Proceedings “Economic Science for Rural Development 2007”, Volume No 12, p. 246-252, Latvia University of Agriculture. ISSN 1691-3078
  5. Gods U. (1998). Mikroekonomika: I daļa, Rīga: SIA “Biznesa augstskola Turība”, 134 lpp.
  6. Jakušonoka I., Jesemčika A., Ozola E. (2008). Assessment of Economic Viability for Agricultural Holdings Included into the FADN of Latvia. International Scientific Conference Proceedings “Economic Science for Rural Development 2008”, Vol. No 17, p. 77-85, Latvia University of Agriculture. ISSN 1691-3078
  7. Krastiņš O., Ciemiņa I. (2003). Statistika: mācību grāmata augstskolām, Rīga: LR CSP, 267 lpp.
  8. LR Finanšu ministrija (2003) Latvijas attīstības plāns (Vienotais programmdokuments) 1.mērķa programma 2004.-2006.gadam. Available at [http://www.esfondi.lv/upload/05-saistosie\\_dokumenti/spd\\_lv\\_04122003.pdf](http://www.esfondi.lv/upload/05-saistosie_dokumenti/spd_lv_04122003.pdf)
  9. LR Zemkopības ministrija. Latvijas Lauksaimniecības un Lauku attīstības SAPARD programmas paveikta (Ex-post) novērtējums. Gala ziņojums 2007.gada novembris. Available at [http://www.zm.gov.lv/doc\\_upl/SAPARD\\_Ex-post\\_Gala\\_zinojums.pdf](http://www.zm.gov.lv/doc_upl/SAPARD_Ex-post_Gala_zinojums.pdf)
  10. LR Zemkopības ministrija. Latvijas lauku attīstības programma 2007.-2013.gads. Available at [http://www.zm.gov.lv/doc\\_upl/latvijas\\_lauku\\_attistibas\\_programma\\_final.pdf](http://www.zm.gov.lv/doc_upl/latvijas_lauku_attistibas_programma_final.pdf)
  11. Mazūre G. (2004). Kredītu, kredītu garantiju un investīciju loma lauku uzņēmējdarbības veicināšanā. Doctoral Dissertation, Faculty of Economics, Latvia University of Agriculture, 162 p.
  12. Rozentāle S. (2008). Ilgtermiņa investīciju efektivitātes novērtēšanas problēmas lauksaimniecībā. International Scientific Conference Proceedings “Economic Science for Rural Development 2008”, Vol. No 15, p. 183-188, Latvia University of Agriculture. ISSN 1691-3078
  13. Rurāne M. (2005). Finanšu menedžments, Rīga: Rīgas Starptautiskā ekonomikas un biznesa administrācijas augstskola, 384 lpp.
  14. Rurāne M. (2007). Uzņēmuma finanses, Rīga: Jumava, 266 lpp.
  15. Saktiņa D., Meyers W.H. (2005). Eiropas Savienības līdzfinansētās un nacionālās lauku atbalsta programmas Latvijā: gatavojoties jaunajam programmēšanas periodam, Rīga: SIA Jelgavas tipogrāfija, 248 lpp.
  16. Špoģis K., Radžele A. (2007). Subsidēšanas un darba ražīguma sakarības lauksaimniecības uzņēmumos Latvijā. International Scientific Conference Proceedings “Economic Science for Rural Development 2007”, Vol. No 14, p. 13-18, Latvia University of Agriculture. ISSN 1691-3078
  17. Upīte I. (2009). Investment Support for Agricultural Development in Latvia. Vision of the Modern Village. Siauliai University, Lithuania, No 3 (16), p.316-323. ISSN 1648-9098
  18. Upīte I., Rukmanis A. (2009). Support Available for Investments by Agriculture Holdings in Latvia. Agricultural Sciences, T.16, No 3-4, Lithuanian Academy of Sciences, p.170-178. ISSN 1392-0200
  19. Vēveris A., Krieviņa A. (2006). Lauksaimniecības sektora attīstības rezultāti 2004.gadā un tendences 2005.gadā. Ko saka LEK? Latvijas lauksaimniecība, lauki un pārtika – ekonomikas attīstības procesi, publikācijas 11.krājums, Rīga: LVAEI, 17.-28. lpp.
  20. Vēveris A., Leimane I., Krieviņa A. (2007). Efficiency Analyses of Agricultural Sector in Latvia Compares to Other EU Countries, Based on FADN Data. Proceedings of the International Scientific Conference „Economic Science for Rural Development 2007”, Vol. No 12, p.13-19, Latvia University of Agriculture. ISSN 1691-3078
  21. Zvirbule-Bērziņa A., Mihejeva L., Auziņa A. (2004). Plānošanas un ražošanas procesa organizēšanas pamatprincipi, Rīga: SIA „Biznesa augstskola Turība”, 143 lpp.