# The Level of Investment Layout
# in European Union Farms

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### SUMMARY

*The paper presents analysis of investment layouts in UE-27 farms having the three biggest economic sizes (16-<40 ESU, 40-<100 ESU, ≥100 ESU) for years of 2004 – 2007. The analysis of the farms of economic size 16 and larger ESU shows that the bigger economic size a farm has, the larger net and gross investment layouts are. The highest ratio of reproduction of fixed assets was noted mainly in the case of farms in new EU member states. In EU-15 countries the earned margin for self-financing of development is not allocated to investments and development, whereas in EU-12 countries the earned margin for development played significant role in investment activities of farmers.*
*Key words: investment layouts, economic size, farming, European Union*
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## INTRODUCTION

Investment activity is a basic type of activity of farms and has a direct effect on their existence and development. The necessity to modernize the production means introducing modern technology into production processe, which plays an essential role in the life of farms in different countries. There is a great need for continuous development of farming due to the increased demand for the protection of natural environment, wellbeing of animals, expectations of customers for the quality of food and growing international competition (Adamowicz, 2008). Specific characteristics of farming production as well as high dependence on natural and climatic factors and spatial character of plant production require great need of fixed assets (Sadowski and Poczta, 2007).

Equipment of farms in terms of fixed assets determinates the possibility of effective use of other elements of production capacity, increase of productivity and competitiveness (Czubak, Sadowski and Wigier, 2010).

The level of investments realized in farms reflects the influence of external factors, mainly connected with the economic situation and internal factors, especially the size of production potential (land, human resource, capital) and the economic power (value of production and income) (Kusz, 2009b). Therefore the great differentiation of production potential of farms in European Union may be also accompanied by diverse level of investment layout.

## PURPOSE AND METHODS OF RESEARCH

The aim of his work is to present and evaluate the level of investment layout in European Union farms of three largest economic size classes (16-<40 ESU, 40-<100 ESU, ≥100 ESU) in the years of 2004 – 2007.

Empiric data originates from Farm Accountancy Data Network for years 2004-2007 (FADN 2010). Due to data availability the information about Malta is related to the years of 2005-2007, for Romania and Bulgaria the data shows 2007. The analysis covers farms from all EU-27 countries represented in the network and is related to the three classes of the largest economic size (16-<40 ESU, 40-<100 ESU, ≥100 ESU). The decision to select only the three farms belonging to classes of the largest economic size for analysis comes from the fact that they determine the level of competitiveness of farming in each country and they show the highest potential of growth. In order to lessen the influence of random fluctuation the analysis was conducted on the basis of average values related to the concerning period.

FADN is a collecting data regarding farms which plays a significant role in creating added value in farming. This is the reason why the presented data is related to representative farms of this group.

# RESULTS OF RESEARCH

The level of investment layout in farms of EU-27 is strongly diversified (table 1). Analysis of farms belonging to the three largest economic size classes shows that in majority of EU member states the larger the economic size is, the higher level of investment layout is: gross and net per single farm. Such a positive correlation between economic sizes and levels of investment activities was also experienced by Sobczynski (2009) and Mikolajczyk (2009) in their research. The only exception were farms in Cyprus, where the net and gross investment value decreased with the increase of economic size.

The highest level of gross investment was characteristic for farms (table 1): in first economic size 16-<40 ESU in Luxemburg (33 480,30 €) and Estonia (30 574 €); in economic class size 40-<100 ESU in Estonia (72 889,50 €), Lithuania (70 854,80 €) and Latvia (69 696,30 €); in economic class size ≥100 ESU Latvia (367 605,30 €) Estonia (235 980 €) and Denmark (223 687,50 €). The lowest value of gross investment layout was noted in farms in Ireland (-507,70 €)and Cyprus (926,50 €) in economic class size 16-<40 ESU; whereas in economic class size 40-<100 ESU and ≥100 ESU Cyprus (accordingly -1 154 €; -2 987,50 €) Greece (accordingly 2 871,20 €; 7 865,50 €) and Spain (accordingly 6 078,50 €; 8 723 €).

*Table 1. The level of investment layout [€/farm] in farms in EU-27 (average for years 2004-2007)*

| Country | Gross investment [€/farm] | | | Net investment [€/farm] | | |
|---|---|---|---|---|---|---|
| | 16-<40 ESU | 40-<100 ESU | ≥100 ESU | 16-<40 ESU | 40-<100 ESU | ≥100 ESU |
| Austria | 17584,7 | 29234,7 | 38893,5 | 2652,7 | 6962,2 | 10279,0 |
| Belgium | 8018,7 | 18174,2 | 55559,7 | -773,0 | 2834,2 | 20299,2 |
| Bulgaria | 10992,0 | 46609,0 | 87433,0 | 6043,0 | 37079,0 | 35961,0 |
| Cyprus | 926,5 | -1154,0 | -2987,5 | -5761,8 | -16363,5 | -25245,5 |
| Czech Republic | 9851,3 | 25133,3 | 129232,5 | 532,8 | 5304,5 | 16877,0 |
| Denmark | 13113,5 | 27829,5 | 223687,5 | 2393,0 | 5236,0 | 153747,8 |
| Estonia | 30574,0 | 72889,5 | 235980,0 | 20143,5 | 48062,3 | 151988,8 |
| Finland | 15181,8 | 45774,0 | 110022,0 | 299,0 | 14643,8 | 40035,8 |
| France | 9474,2 | 21623,7 | 45648,0 | -1598,2 | -1165,5 | -413,7 |
| Germany | 9572,2 | 23061,2 | 65850,2 | -1629,0 | 2035,2 | 13705,0 |
| Greece | 1169,7 | 2871,2 | 7865,5 | -3273,5 | -4930,5 | -5576,5 |
| Hungary | 11970,0 | 26657,5 | 128879,5 | 2227,8 | 2934,3 | 21699,2 |
| Ireland | -507,7 | 12501,5 | 28879,5 | -9351,7 | -4201,2 | -9397,0 |
| Italy | 3962,7 | 11034,7 | 33769,0 | -2760,0 | -2025,2 | -885,5 |
| Latvia | 24833,5 | 69696,3 | 367605,3 | 15431,5 | 42322,3 | 254836,5 |
| Lithuania | 27595,5 | 70854,8 | 194921,0 | 20645,5 | 53314,0 | 133799,0 |
| Luxembourg | 33480,3 | 58421,3 | 121265,5 | 7507,5 | 16978,3 | 50379,0 |
| Malta | 4193,6 | 26667,3 | 88555,0 | 954,0 | 19100,7 | 73060,7 |
| Netherlands | 4155,0 | 19515,3 | 125756,5 | -7967,5 | -1228,3 | 58633,0 |
| Poland | 10808,0 | 30728,5 | 67774,8 | 4473,8 | 17879,3 | 21009,0 |
| Portugal | 4995,0 | 27316,5 | 24580,0 | -739,5 | 13212,8 | 875,3 |
| Romania | 5917,0 | 43230,0 | 158830,0 | -3986,0 | 20589,0 | 69908,0 |
| Slovakia | 17921,0 | 38652,0 | 133950,0 | 2618,0 | -7536,0 | -191457,0 |
| Slovenia | 18929,2 | 55815,0 | - | 5351,7 | 30363,7 | - |
| Spain | 2424,0 | 6078,5 | 8723,0 | -834,7 | -453,2 | -2944,5 |
| Szwecja | 17801,0 | 39432,3 | 122370,0 | 559,8 | 9139,8 | 38906,8 |
| United Kingdom | 11619,0 | 22518,7 | 76993,0 | 828,2 | 4550,7 | 26735,2 |
| EU-15 | 10136,3 | 24359,2 | 72657,5 | -979,1 | 4105,9 | 26291,9 |
| EU-12 | 14542,6 | 42148,3 | 144561,2 | 5722,8 | 21087,5 | 51130,6 |

Source: own calculations based on (Farm…2010)

Gross investments show the total investment layout needed to reproduce assets and to increase them. According to the methodology of FADN a gross investment means the value of purchased and produced fixed assets decreased by the value of sold and handed over fixed assets free of charge in the accounting year plus the of value of the basal herd. On the other hand, the net investments mean gross investment minus the value of depreciation. The net value of realized investments determines the real increase of assets (potential of production) (Woś, 2004). Not only the

reproduction of the existing assets, but also the investments in their development which make the modernization of the farm possible are the necessary conditions for development of farming and are crucial for promoting their competitiveness on the global market (Wasilewska, 2009). If the value of net investments is negative, it is a sign that the assets are decapitalized. A situation like this was experienced in farms of all analysed economic sizes in Cyprus, France, Greece, Ireland and Spain. Positive value of net investments was characteristic for farms of all

economic classes in Bulgaria, Czech, Denmark, Estonia, Finland, Hungary, Latvia, Luxemburg, Malta, Poland, Slovenia, Sweden and Great Britain (table 1).

On the other hand the level of net investment layout per one person in the vase of full employment (table 2) was the highest in Latvian farms of economic class 16-<40 ESU (8 941,10 €) as well as of 40-<100 ESU, whereas in the group above 100 ESU Danish farms took the best position (investment level: 49 059,80€). The highest value of investment layout per 1ha of farming land was stated in Malta farms in three analysed economic size classes. The lowest level of net investments calculated per one person in the case of full employment as well as per 1 ha of farming land was characteristic for farms in Cyprus, Greece and Ireland.

Important information regarding development possibilities of farms is the ratio of reproduction of fixed assets, calculated as the relation between gross investment expenses and value of fixed assets (Sobczyński, 2009). The highest ratio of reproduction of fixed assets was stated mainly in new member-countries: Latvia, Lithuania, Estonia, Bulgaria, Czech Republic, Poland, Slovenia and Hungary (table 3). This may result from the improvement of their economic situation after they entered the European Union , gained better access to the financial means for investments, and had easier access to new technologies (Kusz, 2009a).

The ability of a farm to finance the investment depends on its opportunity to acquire financial means. The amount of the external capital depends on the value of the worked out income and willingness of farmers to cut down on current consumption (Kusz, 2009b). Taking into ocnsideration of the amount of the worked out income of the farm, it is possible to define the growth capacity of the farm and the amount to be allocated, the so called surplus needed to self-finance the development. The gross income of the farm is the base to define the amount needed for self-financing. This value should finance the minimum stipulated costs of own work and the credit installments. The farmer can use the left over surplus as his own contribution to the investment activity (Goraj and Mańko 2009). The costs of his own work was calculated as follows: the cost of hired labour was divided by number of units of paid work. The estimated surplus related to the value of depreciation and in this way the ratio of self-financing of reproduction was received. If the value of the ratio is above 1, it shows the capacity for extended reproduction. If the reproduction ratio equaling 1- straight reproduction is true, the ratio from 0 to 1- reproduction is restricted. Negative ratio means that not only the reproduction of fixed assets does not take place, but in order to maintain activity it is necessary, for example, to sell the assets (Sobczyński 2009). Analysing the ratio of self-financing of reproduction it is noticeable that in most countries of EU-27 this ratio was above 1. This indicates the capacity for extended reproduction. The highest value of this ratio was noted in Spain, Malta, Greece, Poland, Latvia, Estonia and Bulgaria (table 3). The lowest ration was obtained in Denmark and Sweden. In farms of economic size ≥100 ESU negative ratio was not registered. Only in Denmark, Slovakia and Sweden the ration was negative in 0-1 span. This shows that farms with higher economic power have higher capacity of self-financing of reproduction.

*Table 2. The level of net investment, calculated per one person in full-time employment €/AWU (annual work unit – full time person equivalent) and per 1 ha of agricultural land [€/ha] AL in farms UE-27 (average for years 2004-2007)*

| Country | Net investment per one person in full-time employment [€/AWU] | | | Net investment 1 per ha AL [€/ha AL] | | |
|---|---|---|---|---|---|---|
| | 16-<40 ESU | 40-<100 ESU | ≥100 ESU | 16-<40 ESU | 40-<100 ESU | ≥100 ESU |
| Austria | 1688,5 | 3468,3 | 3209,0 | 78,4 | 145,7 | 178,5 |
| Belgium | -665,8 | 1819,8 | 7530,2 | -31,8 | 73,6 | 338,4 |
| Bulgaria | 1285,7 | 4772,1 | 1166,1 | 71,8 | 148,4 | 36,1 |
| Cyprus | -2888,1 | -4725,0 | -6883,8 | -458,9 | -690,9 | -355,4 |
| Czech Republic | 257,8 | 1325,7 | 437,5 | 6,9 | 29,3 | 16,0 |
| Denmark | 2917,6 | 4163,2 | 49059,8 | 70,1 | 77,4 | 961,5 |
| Estonia | 6532,8 | 6645,5 | 5878,7 | 124,0 | 130,6 | 153,4 |
| Finland | 219,4 | 6995,5 | 10271,8 | 6,1 | 207,5 | 451,4 |
| France | -1243,6 | -662,1 | -124,8 | -34,8 | -14,9 | -3,1 |
| Germany | -1151,0 | 1136,5 | 3024,0 | -51,3 | 33,6 | 67,5 |
| Greece | -1837,9 | -1900,6 | -1289,8 | -231,7 | -168,6 | -343,7 |
| Hungary | 1102,1 | 853,0 | 809,3 | 28,9 | 16,9 | 25,1 |
| Ireland | -7273,0 | -2627,4 | -2999,8 | -167,3 | -64,0 | -77,1 |
| Italy | -1915,2 | -899,2 | -184,6 | -154,0 | -57,6 | -16,1 |
| Latvia | 5088,9 | 6234,0 | 6762,5 | 110,9 | 129,7 | 282,6 |
| Lithuania | 8941,1 | 12873,2 | 5173,4 | 154,5 | 188,2 | 155,5 |
| Luxembourg | 6225,8 | 9807,8 | 20293,5 | 144,1 | 226,2 | 368,6 |
| Malta | 470,4 | 6230,5 | 12685,7 | 242,1 | 3503,3 | 14267,5 |
| Netherlands | -6206,5 | -668,8 | 15237,7 | -538,8 | -45,8 | 1293,5 |
| Poland | 1972,5 | 5211,6 | 1687,5 | 129,4 | 242,9 | 47,0 |

| Country | Net investment per one person in full-time employment [€/AWU] | | | Net investment 1 per ha AL [€/ha AL] | | |
|---|---|---|---|---|---|---|
| | 16-<40 ESU | 40-<100 ESU | ≥100 ESU | 16-<40 ESU | 40-<100 ESU | ≥100 ESU |
| Portugal | -361,5 | 4298,2 | 208,0 | -14,1 | 108,4 | 6,7 |
| Romania | -664,3 | 1767,3 | 1788,4 | -34,5 | 52,6 | 61,2 |
| Slovakia | 615,8 | -889,2 | -3713,7 | 14,8 | -21,2 | -122,4 |
| Slovenia | 1849,7 | 9573,2 | | 231,8 | 655,2 | - |
| Spain | -588,1 | -265,2 | -1078,8 | -23,0 | -7,5 | -21,5 |
| Szwecja | 437,6 | 5280,4 | 11004,4 | 7,6 | 77,6 | 156,1 |
| United Kingdom | 618,9 | 2449,1 | 6111,8 | 6,8 | 29,8 | 108,7 |
| EU-15 | -609,0 | 2159,7 | 8018,2 | -62,2 | 41,4 | 231,3 |
| EU-12 | 2047,0 | 4156,0 | 2344,7 | 51,8 | 365,4 | 1324,2 |

Source: own calculations based on (Farm…2010)

In order to define the factors influencing the level of realized investments in European Union farms of economic size 16 ESU, the method of lineal regression was used. Analysis of lineal regression was conducted using the step-proceeding method.

Basing on the merits and accessibility of the data a list of variables was created which can explain directly or indirectly the level of investment layout in farms which conduct the accounting for purposes of European FADN. Due to the difference between farms in countries EU-15 and EU-12 (Sobczyński, 2009) the analysis was conducted separately for each group of countries. As dependent variable were chosen: due to high dynamics of labour cost (Runowski, 2009; Ziętara, 2008) and the necessity of substitution of live work with capital Y1 – value of net investment layout per person in full-time employment [€/AWU] and also due to the fact that it is the capital that decides about the production possibility and competitiveness of farms (Kowalczyk, 2007) Y2 – ratio of reproduction of fixed assets [%].

*Table 3. Ratio of reproduction of fixed assets and ratio of ability to self-finance reproduction of farms UE-27 (average for years 2004-2007)*

| Country | Ratio of reproduction of fixed assets [%] | | | Ratio of ability to self-finance reproduction | | |
|---|---|---|---|---|---|---|
| | 16-<40 ESU | 40-<100 ESU | ≥100 ESU | 16-<40 ESU | 40-<100 ESU | ≥100 ESU |
| Austria | 5,65 | 7,00 | 7,69 | 1,44 | 2,10 | 2,99 |
| Belgium | 4,50 | 5,83 | 8,80 | 0,86 | 1,57 | 2,35 |
| Bulgaria | 15,05 | 32,95 | 21,34 | 3,70 | 4,40 | 2,96 |
| Cyprus | 0,53 | -0,34 | -0,40 | 1,03 | 1,61 | 2,23 |
| Czech Republic | 5,78 | 7,86 | 5,33 | 1,82 | 2,24 | 1,68 |
| Denmark | 2,25 | 2,65 | 8,44 | -0,92 | -2,88 | 0,70 |
| Estonia | 20,02 | 20,83 | 19,33 | 3,07 | 3,02 | 2,75 |
| Finland | 7,28 | 12,18 | 14,93 | 0,91 | 1,24 | 1,17 |
| France | 7,39 | 11,05 | 13,68 | 0,61 | 1,12 | 1,62 |
| Germany | 2,18 | 3,74 | 6,71 | 0,36 | 1,45 | 1,73 |
| Greece | 0,96 | 1,53 | 2,99 | 4,28 | 4,64 | 7,74 |
| Hungary | 8,59 | 9,41 | 12,41 | 2,33 | 2,30 | 1,75 |
| Ireland | -0,05 | 0,85 | 1,08 | 1,42 | 2,42 | 2,38 |
| Italy | 1,33 | 1,91 | 1,84 | 1,50 | 3,07 | 6,10 |
| Latvia | 29,52 | 34,55 | 33,06 | 3,51 | 2,89 | 2,36 |
| Lithuania | 22,47 | 26,32 | 22,40 | 6,39 | 5,86 | 3,92 |
| Luxembourg | 6,51 | 7,56 | 9,71 | 1,07 | 1,40 | 1,72 |
| Malta | 1,60 | 4,16 | 6,84 | 3,24 | 6,01 | 9,43 |
| Netherlands | 0,84 | 2,10 | 5,70 | -0,45 | 0,54 | 1,34 |
| Poland | 8,47 | 11,87 | 8,75 | 3,13 | 3,71 | 3,41 |
| Portugal | 5,31 | 12,16 | 6,39 | 1,91 | 2,55 | 3,29 |
| Romania | 4,90 | 11,61 | 15,73 | 1,22 | 3,41 | 3,63 |
| Slovakia | 13,08 | 9,01 | 4,06 | 1,25 | 0,89 | 0,67 |
| Slovenia | 5,51 | 9,41 | - | 1,54 | 2,39 | - |
| Spain | 1,41 | 1,96 | 1,32 | 5,31 | 7,28 | 9,46 |
| Szwecja | 4,84 | 6,85 | 10,51 | -0,08 | 0,49 | 0,84 |
| United Kingdom | 1,95 | 2,76 | 4,50 | -0,14 | 1,06 | 1,91 |
| EU-15 | 3,5 | 5,3 | 7,0 | 1,2 | 1,9 | 3,0 |
| EU-12 | 11,3 | 14,8 | 13,5 | 2,7 | 3,2 | 3,2 |

Source: own calculations based on (Farm…2010)

As independent variable selected were variables describing production potential of farms: x1 – economic size [ESU], x2 – technical equipment of work [value of fixed assets €/AWU]; variable describing development ability of the farm: x3 – ratio of ability to self-finance the reproduction and variable characterising the production intensity: x4 – cost of fertilizers per 1ha AL [€/ha AL], x5 – cost of plant protection agents per 1 ha AL [€/ha AL], x6 – stock of animals [LU/ha].

Level of net investment layout per one person in the case of full employment in EU-15 countries was explained with 3 independent variables (table 4). With the increase of economic size of the farm and the growth of the amount of technical equipment used in work, the level of net investment per one person in full employment also increased. On the other hand, the increase of the ratio of ability to self-finance the reproduction has a negative impact on the value of the described dependent variable. The negative correlation between the level of net investment per one person in full employment and the ratio of ability to self-finance the reproduction may indicate that despite the existing surplus no money was

allocated to finance the development of the farm. The matching of the selected model to the empiric data is 28%.

For the explanation of the level of net investment layout per one person in full employment in countries of EU-12 three independent variables were used (table 5). Increase of the ratio of ability to self-finance the reproduction contributed to the increase of the net investment layout per one person in full employment. This may indicate the fact that in the countries of EU-12 increase of ability to self-finance measured by the ratio of self-financing of reproduction was accompanied by the real increase of the investment layout per one person in full employment. The growing number of technical equipment used in work also contributed to the increase of the described dependent variable. On the other hand, the described dependent variable was influenced by the increase of the level of intensity of farming production measured with cost of plant protection agents per 1 ha of farming land. The matching of the selected model to the empiric data is 53,34%.

### Table 4. Resumption of variable dependent regression:
*Y1 – value of net investment layout per person in full-time employment [€/AWU] for UE-15*

| Independent variables | BETA | Standard error BETA | B | Standard error B | t(168) | level p |
|---|---|---|---|---|---|---|
| Free word | | | -2211,49 | 1487,490 | -1,48673 | 0,138917 |
| $x_1$ | 0,507557 | 0,074950 | 61,16 | 9,031 | 6,77190 | 0,000000 |
| $x_2$ | 0,151394 | 0,070679 | 0,01 | 0,003 | 2,14201 | 0,033599 |
| $x_3$ | -0,143296 | 0,071013 | -573,55 | 284,235 | -2,01787 | 0,045159 |
| Model: $Y_1 = -2211,49 + 61,16x_1 + 0,01x_2 - 573,55x_3$ | | | | | | |

R= 0,52918852; $R^2$= 0,28004049; F(4,172)=16,726; p<,00000; $S_e$ = 8325,6
Source: own calculations based on (Farm…2010)

### Table 5. Resumption of variable dependent regression:
*Y1 – value of net investment layout per person in full-time employment [€/AWU] for UE-12*

| Independent variables | BETA | Standard error BETA | B | Standard error B | t(168) | level p |
|---|---|---|---|---|---|---|
| Free word | | | -2459,16 | 695,2963 | -3,53685 | 0,000588 |
| $x_3$ | 0,800845 | 0,071686 | 2148,81 | 192,3464 | 11,17159 | 0,000000 |
| $x_5$ | -0,432718 | 0,087579 | -26,70 | 5,4033 | -4,94089 | 0,000003 |
| $x_2$ | 0,158411 | 0,081854 | 0,01 | 0,0076 | 1,93530 | 0,055453 |
| Model: $Y_1 = -2459,16 + 2148,81x_3 – 26,7x_5 + 0,01x_2$ | | | | | | |

R= 0,73035391; R2= 0,53341684; F(3,113)=43,062; p<,00000; Se = 3430,1
Source: own calculations based on (Farm…2010)

Among variables which are statistically significantly related to the ratio of reproduction of fixed assets for the EU-15 countries there were 4 dependent variables (table 6). Only the growth of the economic size caused the increase of the ratio of reproduction of fixed assets. Negative influence on the ratio of reproduction of fixed

assets had following variables: technical equipment used in work, ratio of ability to self-finance the reproduction, level of costs of plant protection agents per 1 ha UR. The matching of the selected model to the empiric data is 35,48%.

*Table 6. Resumption of variable dependent regression:*
*Y2 – ratio of reproduction of fixed assets [%] for EU-15*

| Independent variables | BETA | Standard error BETA | B | Standard error B | t(168) | level p |
|---|---|---|---|---|---|---|
| Free word | | | 0,076584 | 0,005832 | 13,13223 | 0,000000 |
| $x_2$ | -0,503382 | 0,066906 | -0,000001 | 0,000000 | -7,52369 | 0,000000 |
| $x_1$ | 0,514124 | 0,070950 | 0,000257 | 0,000035 | 7,24629 | 0,000000 |
| $x_3$ | -0,398955 | 0,067223 | -0,006613 | 0,001114 | -5,93478 | 0,000000 |
| $x_5$ | -0,198878 | 0,069249 | -0,000137 | 0,000048 | -2,87191 | 0,004593 |
| Model: $Y_2 = 0,076584 - 0,000001x_2 + 0,000257x_1 - 0,006613x_3 - -0,000137x_5$ | | | | | | |

R= 0,5956873; R2= 0,3548433; F(4,172)=23,650; p<0,00000; Se =0,03264
Source: own calculations based on (Farm…2010)

*Table 7. Resumption of variable dependent regression:*
*Y2 – ratio of reproduction of fixed assets [%] for EU-12*

| Independent variables | BETA | Standard error BETA | B | Standard error B | t(168) | level p |
|---|---|---|---|---|---|---|
| Free word | | | 0,136123 | 0,014214 | 9,57689 | 0,000000 |
| $x_2$ | -0,441278 | 0,081113 | -0,000001 | 0,000000 | -5,44027 | 0,000000 |
| $x_3$ | 0,569387 | 0,071037 | 0,031517 | 0,003932 | 8,01531 | 0,000000 |
| $x_5$ | -0,385829 | 0,086787 | -0,000491 | 0,000110 | -4,44571 | 0,000021 |
| Model: $Y_2 = 0,136123 - 0,000001x_2 + 0,0315117x_3 - 0,000491x_5$ | | | | | | |

R= 0,73608439; R2= 0,54182022; F(3,113)=44,543; p<0,0000; Se = 0,07012
Source: own calculations based on (Farm…2010)

In the farms in EU-12 countries the increase of ratio of ability to self-finance reproduction contributed to the increase of the ratio of reproduction of fixed assets. Whereas a negative correlation was noticed between the ratio of reproduction of fixed assets and technical equipment of work as well as the value of cost of plant protection agents per 1 ha UR (table 7). The matching of the selected model to the empiric data is 54,18%.

In this place it is worth mentioning that like in the case of the analysis of regression for the dependent variable Y1 – the value of the net investment layout per one person in full-time employment differs from the influence of the ratio of self-financing of reproduction on the ratio of reproduction of fixed assets – Y2. In EU-12 countries this ratio is positive, whereas in countries EU-15 this correlation is negative. Similar correlation was observed in the research conducted by Sobczyński (2009) regarding possibility of development of farms EU-25. The quoted author noticed that in the EU-15 countries there was no correlation between the ratio of ability to self-finance the reproduction and the ratio of realized reproduction and reproduction and increase of fixed assets, whereas in EU-10 such correlation existed. It means that there is difference in investment behaviour of farmers in EU-15 and in EU-12 countries. This may indicate the fact that farmers from EU-12 new-member states tend to allocate the worked out gross profit from their farms in greater extend to self-financing of investment activity than farmers from EU-15 countries.

# SUMMARY

The analysis of farms of economic size 16 and over ESU showed that while the economic size increased, the gross and net level of investment layout also increased. Whereas the highest ratio of reproduction of fixed assets was noticed mainly in farms of new-member countries, which may indicate that access to the European Union accelerated the investment activity of farmers.

Differences between investment behaviour of farmers of EU-15 countries and of EU-12 new-member states were noticed. In EU-15 countries negative correlation was stated between the ratio of ability to self-finance the reproduction and the level of net investment layout and the ratio of reproduction of fixed assets, whereas in EU-12 countries this correlation was positive. This may indicate that in EU-15 countries the worked out surplus for self-financing of development is not related to investment and development, whereas in EU-12 the level of worked out surplus for self-financing of development determined the investment activity of farmers. Another factor which could activate investment activity of EU-12 farmers was the possibility to make use of EU structural funds for modernization and development of farming.

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