Comparison of the simplified system of direct payments with the system applied by the EU-15

Srovnání zjednodušeného systému přímých plateb se systémem aplikovaným v EU-15

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Abstract: The simplified system of direct payments in 2005 is being compared in this contribution with the standard direct payments (a system applied in the EU-15) and with the system applied in 2004. Production and economic indicators exploited in this analysis were provided by the agricultural enterprises for the period 2003–2005. For the selected file of enterprises there were calculated the claims for subsidies according to various systems of direct payments administration and the volume of direct payments was recounted per ha of agricultural land. The enterprises were divided according to the LFA proportion in the total area of farmed land. The analysis was realized due to the means and in the frame of the project NAZV QG 60042.

Key words: standard direct payments, simplified payments, SAPS, Top-up

Abstrakt: V příspěvku je porovnán zjednodušený systém přímých plateb v roce 2005 se standardními přímými platbami (systém aplikovaný v EU-15) a se systémem aplikovaným v roce 2004. K analýze byly použity výrobní a ekonomické ukazatele poskytované zemědělskými podniky za rok 2003–2005. Výběrovému souboru zemědělských podniků byly vypočteny nároky na dotace podle různých systémů administrace přímých plateb, přičemž objem přímých plateb v Kč byl přepočten na hektar zemědělské půdy a podniky byly rozděleny podle podílu výměry LFA k výměře obhospodařované zemědělské půdy celkem. Analýza byla provedena za použití prostředků a v rámci řešení projektu NAZV QG 60042.

Klíčová slova: standardní přímé platby, zjednodušené platby, jednotná platba na plochu, národní doplňkové platby

Direct payments are the pillar of financial subsidies provided in the agrarian sector. The goal of the subsidies is, among others, the stabilization of the agricultural market, raising the level of living standard of farmers and rural development. Subsidies to the agrarian sector do not only pay back the society by healthy and price friendly foodstuff but also by the fact that agriculture supports in a significant way the preservation and development of the rural areas and it maintains the countryside settled.

Within the whole EU, a lively debate takes incessantly place concerning a complex CAP reform and the way of its financing. The accent is put not on quantity but on quality of production.

The goal of the 2003 reform was "decoupling" of subsidies payments from production. Contrarily to the previous period when the subsidy was bound to the volume of production and the kind of commodity, the current subsidy regards the area of farmed land.

The Czech Republic has applied the Single Area Payment Scheme (SAPS) since its accession to the EU. The Cross Compliance (CC) implementation is conditioned by applying the Single Payment Scheme (SPS) (Netrda 2006).

The new member states, including the Czech Republic, are only getting ready for the SPS while in the EU-15 the SPS has already been applied. The basis for the SPS assessment was the direct payments used up to 2003. Since the methodology is very complicated and the impacts have not been verified, the non-governmental agrarian organizations of the new member states ask for the possibility to decide within national competence to delay the term of the SPS introduction

to 2011. The low basis of reference and low structure of agriculture are the reason of the delay.

Currently, opinions have appeared among the agrarian public, that our farmers would incur the damage by the implementation of the simplified direct payments system and that they would receive a higher rate of payments were the standard payments applied. To verify the correctness of this hypothesis is the goal of our analysis.

MATERIAL AND METHODOLOGY

Three systems of direct payments are compared in the analysis:

1. Standard direct payments

The Czech Republic had been preparing for this system till 2004 and it was applied in the EU-15 till 2004. Claims for these payments were calculated for the monitored enterprises according to production indicators for 2005, but in the payments for plant production, the subsidies for starch potatoes are missing. However, their influence on the total result is negligible.

Payments in animal production include:

a) Special premium (the number of bulls over 340 kg was estimated as 60% of bulls in the fattening).

b) Suckler cows premium (real situation in 2005)

c) Slaughter premium (the numbers were calculated as a proportion to the total number of cattle, according to numbers in 2003).

d) Extensification payment (real situation in 2005).

e) Ewe and she-goat premium (real situation in 2005).

f) Additional ewe payment (real situation in 2005).

g) Dairy premium (real situation in 2005).

The rates were counted as 60% of rates paid in EU-15 (Table 1).

2. The simplified system for 2004

The system of direct payments applied in 2004 comprised the SAPS. The basic rate per ha of agricultural land was calculated as a proportion of the assigned national limit and the number of hectares of the registered agricultural land. The amount of the subsidy was determined as a product of the basic rate per 1 ha of agricultural land and the ascertained area of agricultural land (Střeleček et al. 2003).

Besides the SAPS, the Ministry of Agriculture ratified the Top-up for 2004, which were paid on arable land, hop-gardens, ewes, goats, suckler cows (further only SC), cattle, fodder crops and flax seed (Table 2).

For comparison, the payments paid in 2004 were recalculated according to production indicators for 2005 and the rates were raised in proportion of the total means determined for Top-up in 2004 to 2005.

3. The simplified system for 2005

Since the EU will not grant subsidies on any Top-up, for which the Union does not provide any direct

Table 1. Standard direct payment rates in CZK

Commodity	Unit	100% EU tariff	55% − 2004	60% − 2005	65%− 2006
Arable crops	ha	7 938	4 366	4 763	5 160
Starch potatoes	t	703	386	422	457
Hop-garden	ha	14 400	7 920	8 640	9 360
Special premium – bulls	livestock unit	6 300	3 465	3 780	
Special premium – oxen	livestock unit	4 500	2 475	2 700	2 925
Suckler cows	livestock unit	6 000	3 300	3 600	3 900
Slaughter premium – adult cattle	head	2 400	1 320	1 440	1 560
Slaughter premium – vealers	head	1 500	825	900	975
Ewe	head	630	346	378	410
Goats	head	504	277	302	328
Additional ewe payment	head	210	115	126	137
Dairy premium	t	172	–	103	112

Source: Council Regulations (EC)

payments by 30th April 2004, the proposal concerning Top-up for 2005 was changed compared with the preceding year. It affected planting of crops fit for arable land payment (cereals including silage maize, soya beans, rape seed, sunflower seed, peas, field beans, sweet lupins, linseed, flax, hempgrown for fibre), planting hops on agricultural land, flax, cattle, goat and sheep breeeding. The direct payment rates provided to applicants in 2005 are shown in Table 3.

The purpose of the evaluation was:
1. To compare the different average level of direct payments during the monitored period.
2. To survey the influence of plant production and animal husbandry on the volume of direct payments depending on the LFA proportion in the total area of agricultural land.
3. To find out the factors which influence these differences.
4. To compare the mutual dynamics of the individual direct payments systems.

5. To evaluate the dependence of the individual direct payments systems on area proportion of an enterprise in the LFA.

The different average level of direct payments was evaluated by the confidence interval of the mean. For comparison of the individual confidence interval of the means, a principle was followed according to which only those differences between means are statistically significant, when the confidence interval of these means do not overlap on a certain level of significance. To determine the confidence interval of the mean, the following statistical methods were used (Čermáková, Středeček 1995).

Standard deviation

$$\sigma = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1}} \tag{1}$$

Comparison of means

$$\bar{d} = \frac{\sum_{i=1}^{n} d_i}{n} \qquad s^2 d = \frac{\sum_{i=1}^{n}(d_i - \bar{d})^2}{n-1} \tag{2}$$

Variation coefficient

$$c = \frac{s}{\bar{x}} \tag{3}$$

Confidence interval of arithmetic mean

$$P\left(\bar{x} - \frac{s}{\sqrt{n}}.t_{1-\alpha/2}(n-1) < \mu < \bar{x} + \frac{s}{\sqrt{n}}.t_{1-\alpha/2}(n-1)\right) = 1-\alpha \tag{4}$$

The mutual dynamics of direct payments was evaluated using the comparison of regression lines of the individual direct payments systems. A hypothesis was followed in the given graphs according to which the compliance of compared direct payments in the individual graphs is expressed by a line passing the origin with a regression coefficient equal to one. If we compare the confidence interval of the regression line and the prediction interval, we can evaluate the rate of compliance of the individual payments. The following statistics were used for this method:

Calculation of regression line parameters

$$b = \frac{N\sum xy - \sum x \sum y}{N\sum x^2 - \left(\sum x\right)^2}, \quad a = \frac{\sum xy \sum x - \sum y \sum x^2}{\left(\sum x\right)^2 - N\sum x^2} \tag{5}$$

Correlation coefficient

$$r_{yx} = \frac{N\sum xy - \sum x \sum y}{\sqrt{\left[N\sum x^2 - \left(\sum x\right)^2\right]\left[N\sum y - \left(\sum y\right)^2\right]}} \tag{6}$$

Table 2. The ratified system of direct payments for 2004

Subject of subsidy	Unit	Subsidy in CZK per unit
SAPS	CZK/ha agr. land	1 830
Arable land	CZK/ha	1 477
Hop- garden	CZK/ha	4 320
Fodder crops and flax seed	CZK/ha	2 480
Cattle	CZK/livestock unit	850
Suckler cows	CZK/head	4 225
Sheep and goats	CZK/head	700

Source: Ministry of Agriculture CR

Table 3. Direct payments in 2005

Payment	Unit	Tariff
SAPS	CZK/ha agr. land	2 110.7
Top-up certain arable crops	CZK/ha	2 314.9
Top-up livestock unit	CZK/livestock unit	2 006.6
Top-up hops	CZK/ha	6 387
Top-up flax	CZK/ha	5 029.3
Top-up starch	CZK/t	2 960.3

Source: Ministry of Agriculture CR

Confidence interval of the regression line

$$P\left(\widehat{y} - t_{1-\alpha/2(n-2)} \cdot s_{yx}\sqrt{\frac{1}{n} + \frac{(x_i - \overline{x})^2}{\sum(x_i - \overline{x})^2}} < \eta < \widehat{y} + t_{1-\alpha/2(n-2)} \cdot s_{yx}\sqrt{\frac{1}{n} + \frac{(x_i - \overline{x})^2}{\sum(x_i - \overline{x})^2}}\right) = 1 - \alpha \tag{7}$$

Prediction interval

$$P\left(\widehat{y} - t_{1-\alpha/2(n-2)} \cdot s_{yx}\sqrt{1 + \frac{1}{n} + \frac{(x_i - \overline{x})^2}{\sum(x_i - \overline{x})^2}} < y < \widehat{y} + t_{1-\alpha/2(n-2)} \cdot s_{yx}\sqrt{1 + \frac{1}{n} + \frac{(x_i - \overline{x})^2}{\sum(x_i - \overline{x})^2}}\right) = 1 - \alpha \tag{8}$$

A test of regression lines and correlation coefficients compliance based on two and more samples has been used to evaluate the compliance of dependence of the individual direct payment systems on the LFA proportion. The following hypotheses have been tested:
– compliance of regression coefficients,
– compliance of intercepts.

One of the following hypotheses can be pronounced based on the result of the test:
– The regression lines have a different behavior. (Neither compliance of regression coefficients nor intercepts has been confirmed).
– The regression lines have the same slope, they are parallel regression lines with a different level (a statistical difference between coefficients b has not been confirmed but the difference between intercepts was confirmed, which is statistically significant).
– The regression lines can be connected into one regression line. Statistically significant differences have not been confirmed between the tested systems (the statistically significant difference has not been confirmed neither for coefficients b nor for intercepts).

To test the compliance of the intercepts of two regression lines this statistics has been used:

$$t = \frac{|a_1 - a_2|}{\sqrt{\frac{s^2 y.x_1}{n_1}\left(1 + \frac{\overline{x_1}}{s^2 x_1}\right) + \frac{s^2 y.x_2}{n_2}\left(1 + \frac{\overline{x_2}}{s^2 x_2}\right)}} \tag{9}$$

This statistics have Student's t-distribution by $n_1 + n_2 - 4$ degrees of freedom was employed, where the confidence limit is determined by fractile

$$t > t_{1-\alpha/2(n_1+n_2-4)} \cup t < t_{\alpha/2(n_1+n_2-4)} \tag{10}$$

The following statistics has been used to test the regression coefficients compliance based on two samples (equation 11).

It has Student's t-distribution by $n_1 + n_2 - 4$ degrees of freedom.

The test of correlation coefficients compliance based on two samples was done according to statistics

$$u = \frac{z_1 - z_2}{\sqrt{\frac{1}{n_1 - 3} + \frac{1}{n_2 - 3}}} \tag{12}$$

which has a normal distribution.

The analysis was realized due to the means and in the frame of the project NAZV QG 60042. The analysts were given the data in cooperation with the Agrarian Chamber of the Czech Republic and the agricultural enterprises concerning years 2003–2005.

RESULTS AND DISCUSSION

The direct payments applied in the Union since 2003 (standard direct payments) are conceived as commodity payments and they should therefore balance the profitability of individual commodities, so that even the less profitable crops found their place in the market and also the corresponding place in production orientation of individual enterprises. From this point of view, direct payments should have a neutral impact in the individual production areas. This implies that due to direct payments, profitability of production in various areas should be the same or at least the value of direct payments in the individual production areas per ha of agricultural land should be balanced (Střeleček, Lososová 2005).

$$t = \frac{|b_1 - b_2| \cdot \sqrt{n_1 + n_2 - 2}}{\left[(n_1 - 2)s^2 y.x_1 + (n_2 - 2)s^2 y.x_2\right] \cdot \left[\frac{1}{\sum(x_{i1} - \overline{x_1})^2} + \frac{1}{\sum(x_{i2} - \overline{x_2})^2}\right]} \tag{11}$$

Table 4. Comparison of the described direct payments systems in CZK/ha of agr. land according to LFA proportion

LFA proportion	Unit	NON LFA (0–50%)	LFA (50–100%)	Total
Number of enterprises		50	58	108
Agricultural land	ha	1 997.9	1 644.2	1 807.9
Arable land	ha	1 746.1	1 144.0	1 428.0
Earning before taxes in 2005	CZK/ha	1 907.9	1 890.6	1 899.5
Standard direct payments (estimation)	CZK/ha	**3 804.5**	**3 141.1**	**3 480.6**
Plant production 2005 (60% EU 15)	CZK/ha	3 356.2	2 514.9	2 945.4
Animal husbandry 2005 (60% EU 15)	CZK/ha	448.3	626.3	535.2
Payments according to 2004 (estimation)	CZK/ha	**4 276.7**	**4 130.2**	**4 205.3**
PP (payments according to 2004)	CZK/ha	3 574.8	2 740.9	3 167.6
AH (payments according to 2004)	CZK/ha	702.0	1 389.3	1 037.7
Direct payments 2005 (reality)	CZK/ha	**4 301.7**	**4 248.8**	**4 276.0**
PP (payments 2005)	CZK/ha	3 342.8	2 602.8	2 981.5
AH (Payments 2005)	CZK/ha	978.8	1 639.2	1 301.4
standard DP/DP 2005	%	88.4	73.9	**81.4**
PP (Standard DP/DP 2005)	%	100.4	96.6	98.8
AH (Standard DP/DP 2005)	%	45.8	38.2	41.1
DP2004/DP2005	%	99.4	97.2	**98.3**
PP (DP2004/DP2005)	%	106.9	105.3	106.2
AH (DP2004/DP2005)	%	71.7	84.8	79.7

Source: Monitoring of agricultural enterprises

1. Comparison of the level of the monitored direct payments systems

Payments calculated per ha of agricultural land would, in the system applied in 2004, reach in average 98% of the really paid payments in the case of the monitored enterprises in 2005. Table 4 shows that impact of both systems is approximately the same in production areas.

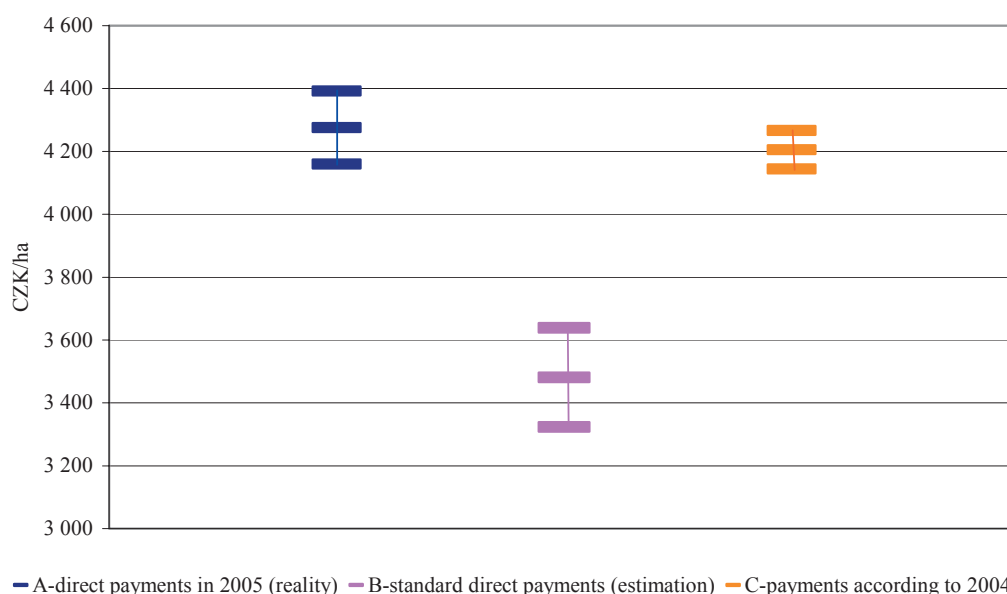Standard payments in the monitored enterprises reach in average only 81% of the payments really

Figure 1. Confidence interval estimation of different direct payments systems

Legend: A-direct payments in 2005 (reality) B-standard direct payments (estimation) C-payments according to 2004

paid in 2005 according to the simplified system (Table 4).

Figure 1 shows the confidence interval of different systems of direct payments according to LFA. We can see that the 2005 direct payments reach the highest values. Regarding the generalization of means, the statistical difference between 2004 and 2005 is not significant. The confidence interval of 2005 is narrow, which means that the effectivity of payments in 2004 was more homogeneous. The mean of standard direct payments is considerably lower and it differs from the previous ones statistically. The absolute difference is also very high. This implies that the use of the standard system of direct payments would lessen the proportion of payments per 1 ha by 796 CZK compared with the real payments in 2005.

2. The LFA influence on the direct payments volume

It is evident, after the model calculations of claims of the agricultural enterprises in the Czech Republic on standard direct payments, that the volume of direct payments in CZK/ha of agricultural land is decreasing according to the deteriorating production and climatic conditions (Střeleček, Lososová 2003) (Tables 4 and 5).

A relatively high equability of the payments system of 2004 is evident from Figure 2, both from the point of view of the level as well as from the variability point of view. The variation coefficient of these payments is 7.62% which influences a small scale of the confidence interval. The maximum scale of the confidence interval is for the LFA proportion of 75% 624 CZK.

The direct payments system from 2005 and 2004 does not show any statistically significant differences between the means, but for the LFA proportion 25 and 50% the given intervals are broader. The average volume of standard direct payments is statistically very different from the average volume of payments in 2004 and it shows lower values. This difference amounts to one quarter for enterprises with a 100% proportion of LFA. We can evaluate the differences between the standard direct payments and the payments in 2005 by a similar method.

Table 5. Comparison of the described direct payments systems in CZK/ha of agricultural land according to LFA proportion

LFA proportion		0–25	2–50	50–75	75–100
Number of enterprises	%	38	12	9	49
Agricultural land	ha	2 059.5	1 802.7	1 787.8	1 617.8
Arable land	ha	1 867.4	1 361.9	1 107.2	1 151.1
Earning before taxes in 2005	CZK/ha	1 994.8	1 593.7	1 522.6	1 965.4
Standard direct payments (estimation)	CZK/ha	**3 885.4**	**3 512.0**	**3 042.5**	**3 161.2**
Plant production 2005 (60% EU 15)	CZK/ha	3 509.4	2 801.9	2 350.5	2 548.3
Animal husbandry 2005 (60% EU 15)	CZK/ha	376.0	710.1	692.0	612.9
Payments according to 2004 (estimation)	CZK/ha	**4 297.4**	**4 202.4**	**4 111.6**	**4 134.1**
PP (payments according to 2004)	CZK/ha	3 711.0	3 082.3	2 526.7	2 784.4
AH (payments according to 2004)	CZK/ha	586.4	1 120.1	1 584.8	1 349.6
Direct payments 2005 (reality)	CZK/ha	**4 328.5**	**4 205.3**	**4 034.1**	**4 292.5**
PP (payments 2005)	CZK/ha	3 477.3	2 856.2	2 350.2	2 654.1
AH (Payments 2005)	CZK/ha	871.1	1 368.7	1 718.5	1 623.1
standard DP/DP 2005	%	89.8	83.5	75.4	**73.6**
PP (Standard DP/DP 2005)	%	100.9	98.1	100.0	96.0
AH (Standard DP/DP 2005)	%	43.2	51.9	40.3	37.8
DP2004/DP2005	%	99.3	99.9	101.9	**96.3**
PP (DP2004/DP2005)	%	106.7	107.9	107.5	104.9
AH (DP2004/DP2005)	%	67.3	81.8	92.2	83.1

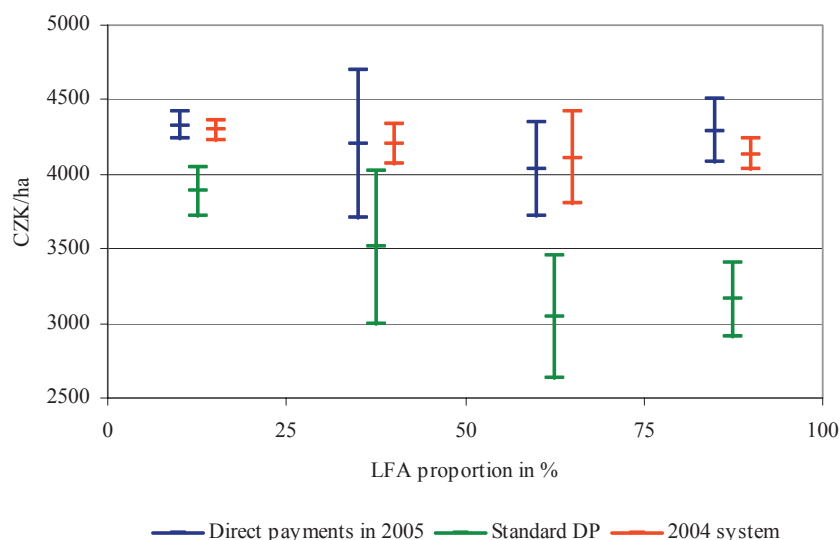Source: Monitoring of agricultural enterprises

Figure 2. The confidence interval of different systems of direct payments according to the LFA proportion

3. The influence of sectors of agricultural production on the volume of direct payments

There is not any statistically significant difference between the average volumes of direct payments in the different systems in plant production. Regarding the land area proportion in individual regions, there is a statistically significant difference in the average rate of the individual payments systems between enterprises with zero LFA proportion and 100% LFA proportion. And there is a difference between enterprises with zero LFA proportion and enterprises with 75% LFA proportion. The decreasing degree of tilth is responsible for this situation.

The degree of tilth is the decisive factor influencing the volume of payments in plant production in dependence on the LFA proportion.

In dependence on LFA proportion, the dynamics of direct payments in animal husbandry shows a very different tendency. Apart from production areas, there are statistically significant differences between the standard direct payments system and the 2005 direct payments system. In two regions, there was a difference between the standard direct payments system and the direct payments system according to 2004.

The payments systems from 2005 and 2004 have the highest growth with the growing LFA proportion. The standard direct payments system shows a great variability. The variation coefficient, which varies from 40% to 129%, shows a great misbalance among the enterprises and their ability to fulfill the conditions for standard direct payments. This is due to the fact that for standard direct payments the claims
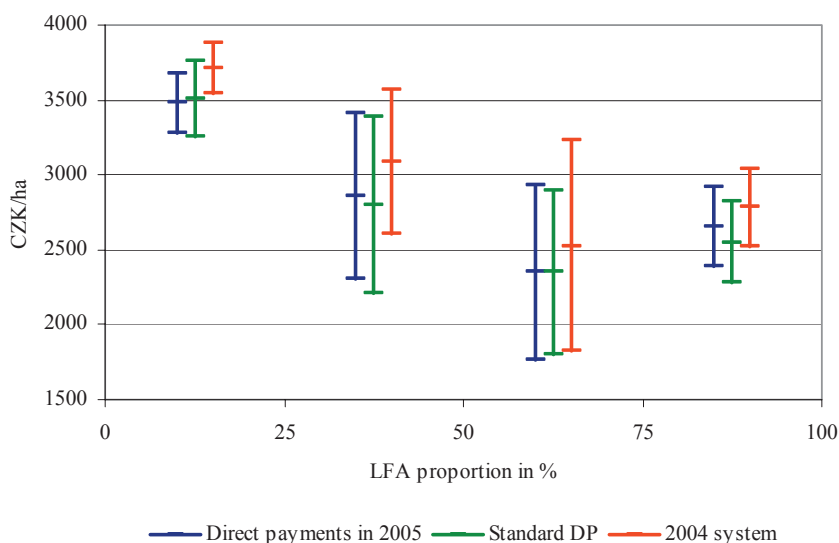

Figure 3. The confidence interval of different systems of direct payments in plant production

Table 6. The degree of tilth according to the LFA proportion

LFA proportion (%)	0–25	2–50	50–75	75–100
Degree of tilth (%)	90.67	75.55	61.93	71.15

Source: Monitoring of agricultural enterprises

are limited. The individual bonuses concern only the restricted number of ruminants. Contrarily in the other two systems of payments, the animal husbandry bonuses are paid for all cattle on the farm.

The system applied in 2004 distributed more means in plant production because the payment was not restricted only to the chosen plants but it was provided for the whole area of arable land. The lower payments in animal husbandry result from the different tariffs for cattle and suckler cows. Both are bred by only 36% of the monitored enterprises while 94% are engaged in cattle breeding.

The system applied in 2005 is more advantageous for enterprises with the LFA proportion higher than 75%. This is caused by the lower rate of payments in plant production. With worsening climatic conditions, the above mentioned differences deepen (Table 5).

4. Factors influencing the different results of the individual direct payments systems

The differences are caused by:
1) The SAPS (50% of direct payments) – all of these means due to these payments are divided per ha of agricultural land. On the other hand, the stand-

ard direct payments in plant production concern only those surfaces of the arable land where the subsidized plants are grown.
2) The SAPS is paid also on permanent pastures. On the other hand, the standard direct payments subsidize the PPs only by the means of payments in animal husbandry, which, however, decrease with the density of ruminants per ha of permanent pastures fodder crops.
3) The ruminant Top-up is divided among all livestock units. Therefore, the maximum of financial means designated for these payments is used up. On the other hand, the cattle bonuses within the standard payments are strongly limited. They do not, however, concern all ruminants. The most important is the slaughter bonus and the suckler cow bonus (the greater the proportion of diary cows is, the lower is the volume of payments per enterprise). Other bonuses are less important and they concern the limited proportion of cattle in the herd.

5. The mutual dynamics of the individual direct payments systems

The evaluation of the mutual dynamics of direct payments was done on two levels. The payments system from 2005 was used as the basis for evaluation of the individual systems of direct payments. In the first version, the systems of direct payments were evaluated in relation to the direct payments system in 2005 (Figures 5–7). If the mutual dynamics of the direct payments system were the same as the payments
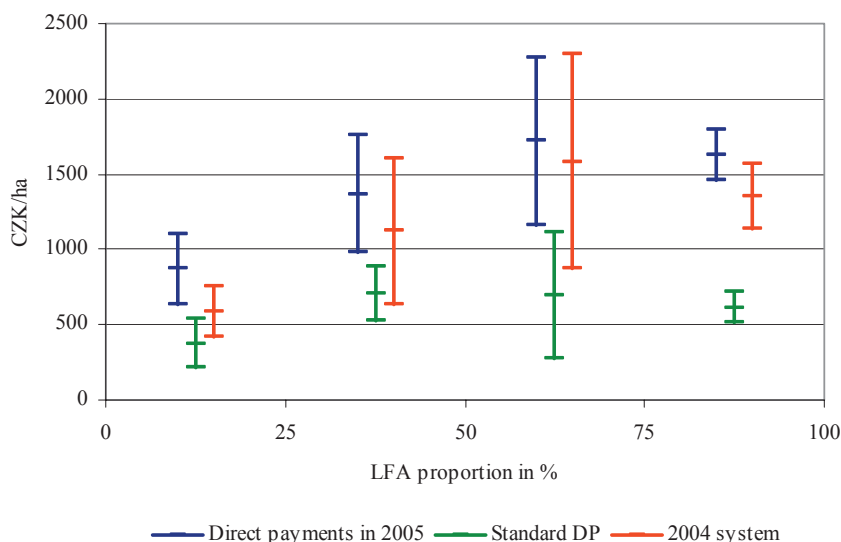

Figure 4. The confidence interval of different systems of direct payments in animal husbandry

system in 2005, then the regression line in the graphs below would cross the origin and it would have the regression coefficient value $b = 1$. Let us mark this line as an identical line. If this line were within the confidence band of the estimated regression line, the difference between the mutual dynamics of both systems could be considered insignificant.

The second version tests the compliance of lines with the same independent variable and different dependant variables. The system is evaluated according to the above mentioned methodology (Table 7).

The Figure 5 shows, that the identical line leaves the confidence interval of the regression line. The slope of the payments in 2005 is higher than the one in payments in 2004 (Figure 6).

Should we compare the system of payments in 2004 with the identical line of 2005, we find out, that in the 3 500–5 000 CZK/ha zone both lines, although having a different slope, adhere to the monitored values. Outside this interval, it is evident that for payments lower than 4 000 CZK/ha the farmers received lower subsidies per 1 ha in 2005. On the other hand, in the area above 4 000 CZK/ha these payments were higher in 2005. The system of subsidies in 2005 has preferred farmers with higher claims to subsidies (Figure 6).
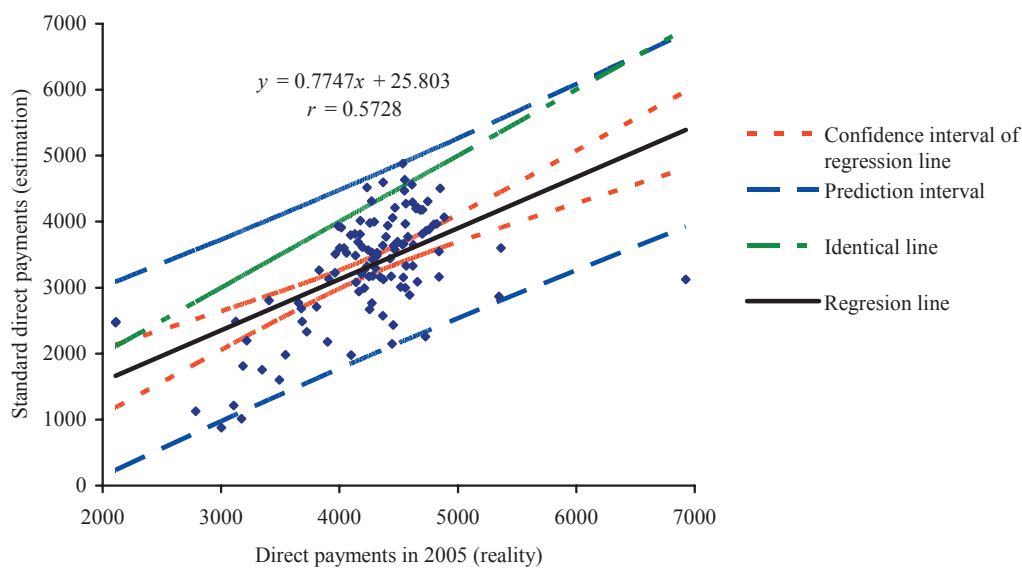

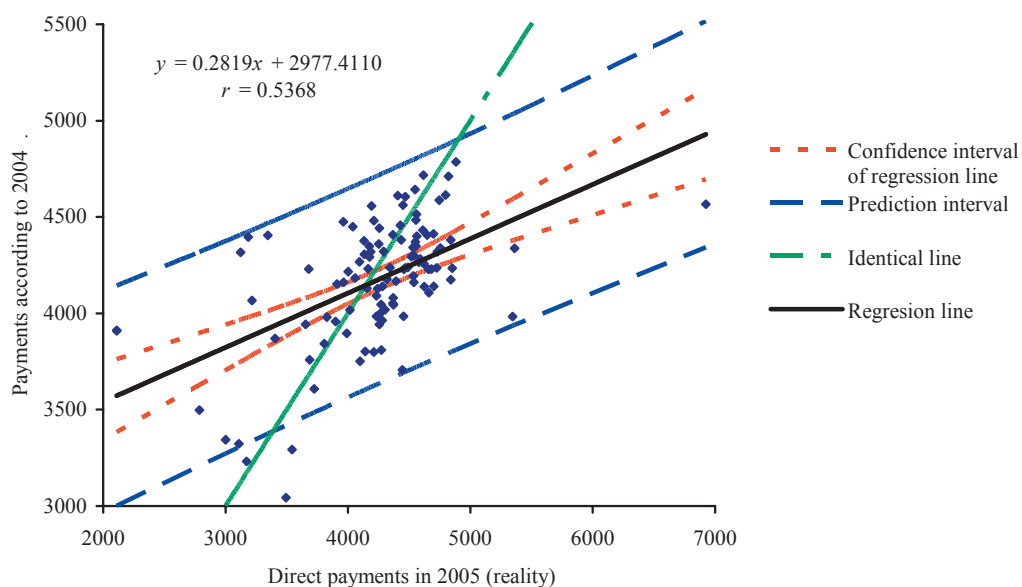Figure 5. Dependence of standard direct payments on real payments in 2005

Figure 6. Dependence of direct payments in 2004 on the real payments in 2005

The comparison of the mutual dynamics of standard payments and the system of direct payments in 2004 in dependence on direct payments in 2005 was tested by the compliance of regression lines according to the above mentioned methodology.

Based on the tests of regression lines compliance, we cannot suppose that there would be significant differences in the slope of the individual lines between 2005 and standard payments and 2005 and 2004. These lines are statistically very different both
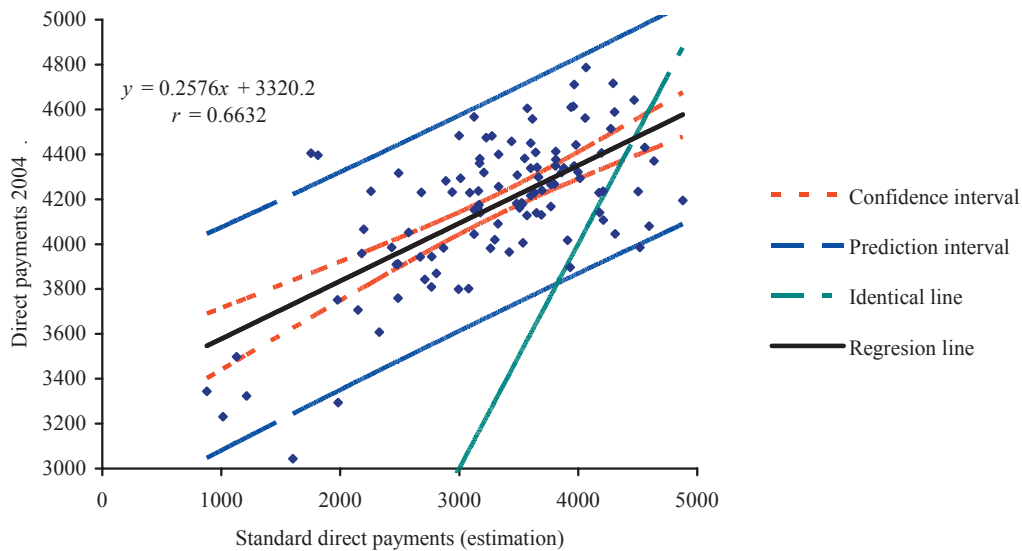

Figure 7. Dependence of direct payments in 2004 on standard direct payments

Table 7. Tests of compliance of regression and correlation characteristics based on two samples

Test of compliance	Dependence of standard payments on 2005 payments	Dependence of the simplified system in 2004 on 2005 payments
of intercept in the regression line equation based on two samples		
Intercept	25.80	2 977.41
T-statistics	41.7019	
$t_{0.975}(212)$	1.9712	
Statistical significance	The difference between regression lines on significance level 0.05 is statistically significant	
of regression coefficients based on two samples		
Regression coefficient	0.7747	0.2819
t-statistics	2.5290	
$t_{0.975}(212)$	1.9712	
Statistical significance	The difference between regression lines on significance level 0.05 is statistically significant	
of correlation coefficients based on two samples		
Correlation coefficient	0.5728	0.5368
Fisher Z transformation	0.6517	0.5996
u-statistics	0.3776	
$N_{0.975}(0, 1)$	1.9600	
Statistical significance	The statistically significant difference between the monitored correlation coefficients has not been confirmed	

in the slope and in position. We cannot expect that the evaluation of the test criteria would show a statistically significant difference between the slope of standard direct payments and the payments in 2004. They are parallel lines that differ only by their position (Table 7).

6. Dependence of the individual direct payments systems on the LFA proportion

In the monitored lines, the degree of statistical dependence oscillated from independence of the real payments in 2005 on the LFA proportion ($r = -0.05$) to the middle degree of the indirect statistical dependence of direct payments on the LFA proportion

($r = -0.45$). The real payments in 2005 seem balanced regarding the LFA proportion. A higher LFA proportion does not influence dramatically the decrease of direct payments. There is a more significant decrease of direct payments in dependence on the increasing LFA proportion in the 2004 payments. And the most significant decrease can be seen in the standard direct payments. From this information, we can derive that in 2005 the compensatory allowance for the LFA could only equal the damages arising from worse production conditions in these areas and it did not have to solve the top-up of direct payments (Table 9).

The volume of direct payments in CZK/ha decreases in all aforesaid systems in dependence on the growing proportion of LFA and it decreases with a different rate of dependence (Figures 8–10). The standard
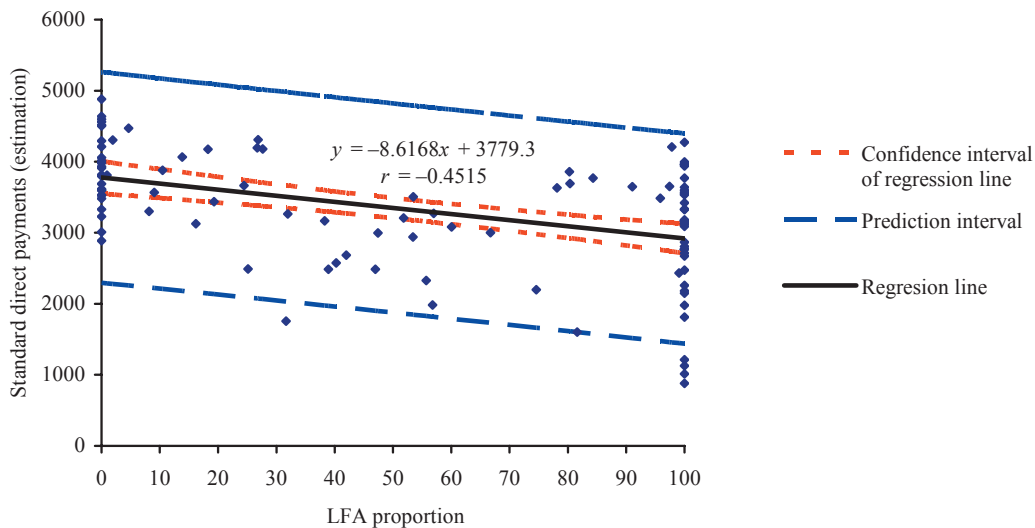

$$y = -8.6168x + 3779.3$$
$$r = -0.4515$$

Figure 8. Dependence of standard direct payments on LFA proportion
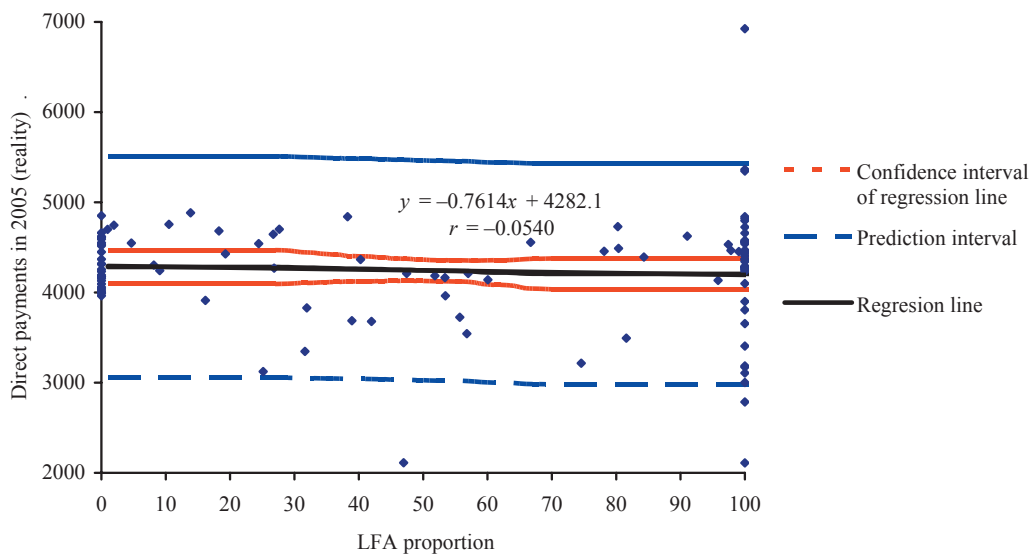

$$y = -0.7614x + 4282.1$$
$$r = -0.0540$$

Figure 9. Dependence of real payments in 2005 on the LFA proportion

direct payments with the 10% increase of the LFA proportion decrease by 86 CZK/ha (Figure 8) show the highest dependence on the growing proportion of LFA.

The real direct payments applied in 2005 show, on the other hand, the lowest dependence of the direct payments rate on the LFA proportion (Figure 9). From this point of view, it is the direct payments in 2005 that reflect in the best way the common agricultural policy. They operate in the same way in all climatic areas and the HRDP for LFA can be used to top-up the worse conditions for farming.

Should we compare the variability of the conditional distribution (conditioned by the LFA proportion on agricultural land), we could for all the aforesaid graphs determine three areas, different from each other according to the conditional variability. These are above all areas with zero or 100% LFA proportion. They have a high symmetric conditional variability. The areas with 30–70% LFA proportion belong to another group. In this interval, the level of the payments according to 2004 and the standard direct payments was far to reach the aforesaid tendency. The same development can be seen smoother for the real direct payments in 2005.

Should the high conditional variability of direct payments for the 100% LFA proportion be analyzed, then as the following Table 8 shows, there is a direct dependence of the direct payments on the degree of tilth and cattle density. The enterprises having a high degree of tilth and higher cattle density on permanent pastures profit from higher payments. In this sense, the direct payments policy seems unnatural.
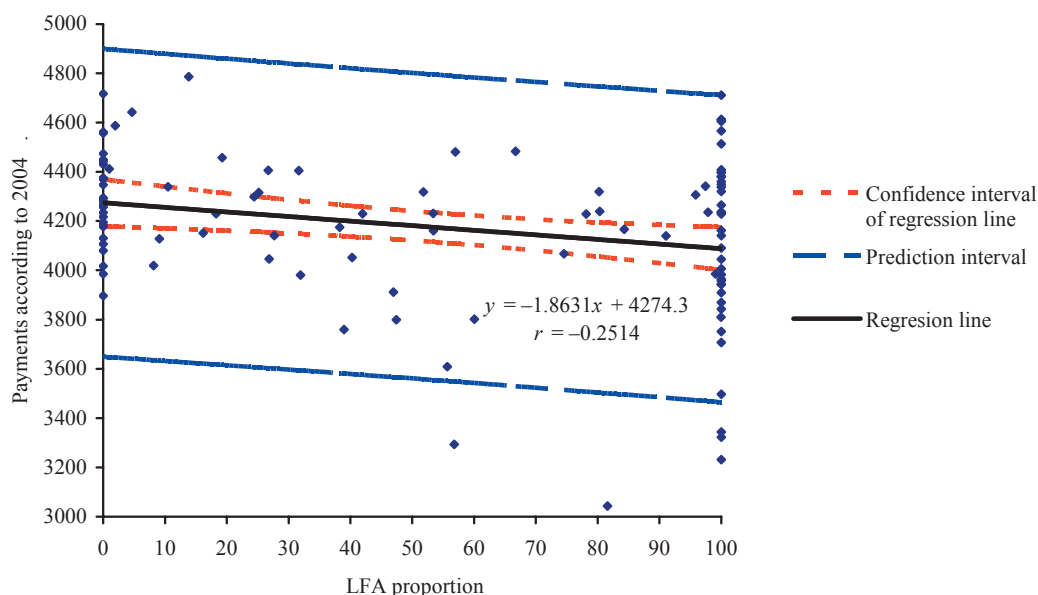

$$y = -1.8631x + 4274.3$$
$$r = -0.2514$$

Legend: Confidence interval of regression line; Prediction interval; Regresion line

Figure 10. Dependence of direct payments in 2004 on the LFA proportion

Table 8. Direct payments in 2005 for 100% LFA enterprises

Total payments (CZK/ha)	Number of enterprises	Degree of tilth (%)	Direct payments in plant production (reality)	Cattle density (LU/ha permanent pastures)	Cattle density (LU/ha agriculture land)	Direct payments in animal husbandry (reality)
to 3 500	7	29.84	875.84	0.58	0.39	2 120.74
3 500–4 000	3	59.87	2 181.29	0.91	0.36	1 643.04
4 000–4 500	14	66.80	2 624.58	1.63	0.47	1 706.28
4 500–5 000	10	77.57	3 035.84	2.83	0.59	1 631.21
Above 5 000	3	68.83	3 113.42	1.91	0.55	2 025.48
Total	37	62.32	2 408.58	1.72	0.48	1 785.15

Source: Monitoring of agricultural enterprises

Table 9. Tests of compliance regression and correlation characteristics based on two samples

Test of compliance	Dependence of standard payments on LFA proportion	Dependence of DP in 2005 on LFA proportion
of intercept in the regression line equation based on two samples		
Intercept	3 779.26	4 282.15
T-statistics	5.3690	
$t_{0.975}(212)$	1.9712	
Statistical significance	The difference in regression lines on significance level 0.05 is statistically significant	
of regression coefficients based on two samples		
Regression coefficient	−8.6168	−0.7614
t-statistics	0.1176	
$t_{0.975}(212)$	1.9712	
Statistical significance	The statistically significant difference between the slopes of the monitored regression lines has not been confirmed	
of correlation coefficients based on two samples		
Correlation coefficient	−0.4515	-0.0540
Fisher Z transformation	−0.4865	-0.0540
u-statistics	−3.1341	
$N_{0.975}(0, 1)$	1.9600	
Statistical significance	The difference in correlation coefficient on significance level 0.05 is statistically significant	

CONCLUSION

The higher payments in plant production are the main differences between the system applied in 2004 and in 2005. The payment per arable land in 2004 was changed to payment per chosen plants on arable land. On the other hand, the payments in animal husbandry in 2005 have increased per average enterprise. This was due to the change in the Top-up in livestock units of ruminants. This payment was divided in 2004 among three payments – livestock units of cattle, suckler cows, sheep and goats. The highest rate was determined on suckler cows and the cattle payment was essentially lower. By merging of these two payments in 2005, an average enterprise received higher payments in animal husbandry. The simplified administration of payments brings along a better financial effect for the majority of monitored enterprises.

The standard direct payments paid in the EU-15 would reach in average only 81% of the really paid payments in 2005. These payments would almost not differ in plant production. But the standard payments in animal husbandry would reach in average only 41% of the really paid payments. The ruminants Top-up is divided among all livestock units in 2005 and therefore maximum financial means is used up for these payments. On the other hand, cattle bonuses within the frame of standard payments are restricted by various limits and they concern only the smaller number of ruminants bred on the farms. Also here does the simplification of the system result in a payment increase.

Since the simplified system cancelled most restrictions resulting from breach of the limitations, the existing system highly benefits from the volume of subsidy means. The volume of the standard direct payments is dependant for a particular enterprise on production structure, degree of tilth and some other factors. Especially in the case of cattle bonuses, the enterprises would be disadvantaged compared with the existing system, especially in the case of enterprises with a low cattle density per hectare of fodder crops and with a high proportion of permanent pastures on agricultural land.

The greater freedom of an enterprise to choose its production orientation according to the market situation (demand, prices of the agricultural producers) and according to its production possibilities (costs, production capacity) is another advantage of the simplified system. The production orientation criterion has become profitability and sale possibilities of

particular products. The unprofitable commodities are also subsidized in order to hinder their significant shortage on the market.

We can therefore conclude that the easier the system of direct payments administration is, the higher is its financial impact per an average enterprise. The simplification also decreases the difficulties in administration when applying for the subsidies and it further decreases the risk of rejecting the applications because of a formal mistake.

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