The national and regional impacts of direct payments modulation in the Czech Republic

Sektorové a regionální dopady opatření modulace přímých plateb v České republice

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Abstract: This paper addresses *(ex ante)* the issue of the potential impact of the modulation of direct payments on a sector and regional scale in the Czech Republic. The ultimate version of the compulsory modulation measure adopted under the Health Check of the Common Agricultural Policy (CAP) assumes the reduction of direct payments if the total individual claim exceeds 5 thousand € or 300 thousand € level. The Czech agricultural sector will be impacted by this measure substantially, given the large scale farming enterprises. In 2013, the total farmers' direct payments will be cut by more than 10% (€ 91 million). Moreover, there are regional differences in farm structures (the average farm size and the extent of collectivization) which will bring about various effects of policies in the heterogeneous regions. The analysis further shows that the regions that are least affected are at the same time more environmental sensitive and are mostly situated in the mountainous or sub-mountainous parts of the country or more urban areas than the average. Hence the effect of the modulation, from a purely environmental perspective, may not contradict the objectives of other environmental policies. That is to say the regions that need support the most will be reduced the least. However, the picture is less obvious in the regional economies where more rural regions (potentially more vulnerable with socio-economic problems) tend to be more affected.

Key words: direct payments, modulation, Health Check, agricultural structures, regions

Abstrakt: Příspěvek se zabývá *(ex ante)* hodnocením možných dopadů modulace přímých plateb na případu českého zemědělství na sektorové a regionální úrovni. Poslední verze opatření povinné modulace přijaté v rámci kontroly zdraví Společné zemědělské politiky (SZP) – tzv. Health Checku – předpokládá krácení přímých plateb, pokud individuální platební nárok je vyšší než 5 či 300 tisíc eur. Přitom české zemědělství bude tímto opatřením významně ovlivněno vzhledem ke své faremní struktuře, ve které dominují velké podniky. Přímé platby budou zemědělským podnikům v roce 2013 zkráceny celkem o více než 10 % (91 mil. €). Vzhledem ke skutečnosti, že mezi jednotlivými regiony v ČR jsou významné rozdíly ve faremní struktuře (průměrná velikost podniků, rozsah podniků s kolektivním rozhodováním), bude efekt vyplývající z modulace v jednotlivých regionech různý. Vlastní analýza odhalila, že nejméně krácené regiony jsou zároveň senzitivnější z pohledu dopadů zemědělství na životní prostředí, jsou převážně situované v horských či podhorských částech ČR a jsou to častěji městské regiony než je průměrný region. Proto by vliv modulace z čistě environmentálního hlediska neměl být v rozporu s cíli ostatních politik orientovaných na uchování životního prostředí, tzn., že regiony, které nejvíce potřebují podporu, budou kráceny nejméně. Nicméně tento obrázek není již tak zřejmý v případě rozdílných regionálních ekonomik, kde jsou podniky ve venkovštějších regionech (potenciálně důležitější a s většími sociálně-ekonomickými problémy) kráceny ve větší míře.

Klíčová slova: přímé platby, modulace, kontrola finančního zdraví, zemědělské struktury, regiony

The progressive attempt and implementation of direct payment limitation has quite a long history as this concept was first introduced in the McSharry CAP reform proposals (1992) as a percentage reduction of the direct payments depending on the size of farm (Boulanger 2008, EC 2008a). During the

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last two years, various proposals to reduce the total amount of payments with their increasing (individual) amount (known as modulation or degressive reduction of direct aid) have been proposed by the European Commission or the European Parliament[1]. The main argument for this limitation is that the distribution of direct income support among farmers is characterized by the allocation of the large number of payments to a rather small number of large beneficiaries – in average in the EU-25, 20% of farms receive 80% of direct payments[2] (EC 2007). Hence larger beneficiaries do not require the same level of the unitary support for the objective of income support to be efficiently attained. The ability to adapt makes it easier for larger beneficiaries to operate with a lower level of unitary support. High payments per holding are exposed to the criticism that they are economically excessive and socially unacceptable (EC 2008a). The next official and more factual argument of the Commission is that additional funding need to be made available for rural development programs in order to face new challenges such as the climate change and the increasing importance of bio-energy, as well as the need for a better water management and a more effective protection of biodiversity (EC 2009).

Finally, on the 20th November, 2008, after the prolonged negotiations, the EU agriculture ministers reached a political agreement on the Health Check of the CAP[3]. Among the measures that the ministers passed was the modulation of direct payments to enable the emphasis to be shifted from direct aid to Rural Development (RD). Currently, all farmers in the countries of the EU-15 receiving more than € 5 000 in direct aid have seen their payments reduced by 5 percent and the money transferred into the RD budget. This rate will be increased to 10 percent by 2012. An additional cut of 4 percent will be made on the payments above € 300 000 a year (EC 2009). It is clear the impact of the modulation will be more profound in countries with the large-scale farming. The Czech Republic has more large farms than most the EU countries and thus will be much more affected by modulation than the other EU countries (EK 2008b, Wait 2007).

Therefore, this contribution deals with the assessment of the potential impacts of the direct payment modulation, as approved by the EU ministers, in the Czech Republic. Due to the heterogeneous environment and farm structures, which vary over the regions, the impact assessment is done on two levels, i) national (sector) and ii) regional. The first approach enabled the general implications of the modulation to be quantified (e.g. the share of the affected farms and the operated area, the value of the reduced payments and the volume of finance needed for co-financing). Second, the regional analysis enabled responses to be made to the questions: How do differences between regions in the extent of individual farming influence the impact of modulation? Is the effect of modulation in line with other sector policies or is it rather contradictory? For the sake of simplicity, the effect resulting from the redistribution of funds into RD programs has not been considered so far. It is necessary to mention that impacts of modulation were not yet elaborated on regional level in the Czech Republic. Previous studies like (Štolbová and Hlavsa 2008; Štolbová 2007) deal with degressive reduction or capping of LFA payments.

AGRICULTURAL FARM STRUCTURES AND THEORETICAL ECONOMIC CONCEPT

As previously stated, one of the Commission's arguments behind the reduction of payments with the increasing size is the ability of larger farms to adapt to the changes coming from the market. This part attempts to assess what the economic literature claims about the advantages and disadvantages of small and large firms existing in agriculture. It is based on the review done by Curtiss (2002), who shows that when defining the "efficiency boundaries" regarding size, there are basically two issues. Firstly, the economies of scale indicating the optimal extent, which is mostly considered as the technically optimal size of production and second, the transactions costs (TCs) associated with the organization size. The basic concept of the description of scale economies is based on the average cost function. If the average costs decrease with an increasing amount of the produced goods or services, we speak about *economies of scale*, or in other words, scale advantages. Considering more products in a firm, we could speak about *economies of scope*, or joint advantages, denotative that the aver-

[1] More information about the history of modulation is in Boulanger (2008) and EC (2008a).

[2] In the Czech Republic as well as in Hungary and Portugal, 10% of farmers received 75% of direct payments. In Slovakia, it is 87% of payments while in Germany only 54%, in Austria 42% and only 28% in Luxemburg.

[3] The official legal document is the Council Regulation No 73/2009 issued on January 19, 2009 establishing the common rules for direct support schemes for farmers under the Common Agricultural Policy and establishing certain support schemes for farmers.

age costs decrease by the simultaneous production of two or more products. With respect to TCs, the firm internal TCs, contrary to the average costs, increase with size. The higher TCs in larger firms relate to the firm's more complex organizational structure, emphasizing the principal-agent problems associated with the administration and the monitoring problems that stimulate "free-riding" and decrease effort. Therefore, the firm has to harmonize the advantages and disadvantages linked to TCs and the scale economies the firm could exploit. Indeed, the existing literature on agricultural farm size provides the evidence that there is no harmonious position among the economists as to whether small, large or both firm organizations are economically optimal, considering both issues.

The issue gets more complex once it is considered that the optimal size varies with the technology characteristics. The economic scale potential increases with the technology innovation, thus the size in competitive markets and economic development could be expected to increase over time. Since technological change is mostly accompanied by the reduction of labour use intensity, TCs can be also expected to decrease, because a higher labour intensity means higher TCs. Then the technological change means partial increases in scale economies due to a reduction in TCs.

Many authors, according to Curtiss (2002), are convinced about the two-sided reality. The arguments supporting large-scale structures in agriculture include:

– decision making by family farmers is the subject of some irrationality so that profit maximizing behaviour is excluded; furthermore, internal family conflicts can be carried onto the work field, the varying work ethic of family members has to be tolerated, the labour abilities of family members do not necessarily cover the needs of the firm;
– imperfect factor and product markets are a major source of the inefficient resource allocation in agriculture organized as family farms;
– larger firms can negotiate discounts by the acquisition of factors of production and they can achieve higher prices for their production due to their better bargaining power;
– a farmer with the average managerial abilities is not able to grow, because of a lack of the growth ambition, of a profit maximizing motive and growth expectations, and because of the risk aversion and knowledge deficiencies.

On the other hand, according to several authors, small family farm units have the advantages in:

– governance of the family as a small farm production team offers many principal-agent TC advantages due to the smallness of the team and the hierarchical structure of family governance (shirking and free-riding among family members is restricted);
– family farms are capable of reducing the difficulties of the supervision, administration and coordination of workers;
– family members are residual claimants to profits and thus have higher incentives to provide "effort" than hired labour, share in the risk, and can be employed more flexibly both on and off-farm without incurring hiring or search costs;
– the above arguments thus lead some authors to the conclusion that part-time farming must be seen as the most efficient response to the prevailing and changing economic conditions.

It follows from the above mentioned arguments that the advantages from the size of farms are usually also accompanied by the disadvantages of size.

DATA AND METHODOLOGY

We used individual data about payment beneficiaries in the Czech Republic (2007 as a reference base) provided by the Payment Agency (SZIF). The reference base was applied to project the individual eligible payments to be applied in 2013 with the phasing-in of direct payments. The projections are based on the precondition that the farm structure is the same as in 2007. Other general parameters and conditions needed for calculation of modulation impacts (the national envelope, possible percentage of finance for Article 68 etc.) are taken from the Council Regulation (EC) No 73/2009. For the regional analysis, the data from the Czech Statistical Office and the Institute of Agricultural Economics and Information was used.

As in the New Member States (NMS) the modulation will not be applied until the level of direct payments is equal to the level in the EU-15 member states, the modulation will start to be applied from 2012 in the EU-10. In the EU-15, the level of payments after the reduction will be 90% (100%–10% basic rate of modulation for farms with direct payments 5 000–300 000 €) resp. 86% (100%–14% rate of modulation for farms with direct aid over 300 000 €) in 2012. In the Czech Republic, the level of direct payments will reach the same level because the SAPS will increase up to 90% as a consequence of phasing-in in 2012. Therefore, the basic rate of modulation for the NMS is zero for the farms in the first modulation category (above € 5 000) and additional rate 4% for the second zone. In year 2013, the level of direct payments in the NMS

will reach 100%, thus the rate of modulation for the EU-15 and the EU-10 will be equal (see Table 1).

According to the Article 68 of the mentioned Regulations, the member states may grant an additional support to farmers for quality and specific production from 2010, which is funded from the national envelope for direct payments and is exempt from modulation. This special payment can be provided e. g. for special types of agricultural activities important for the protection and improvement of the environment or to improve the quality of agricultural products and the marketing of agricultural products. For this measure, the NMS can use an amount not exceeding 10% of their national ceiling specified for the year 2013. For this reason, two extreme scenarios were explored – ***scenario A***, when the measure of the Article 68 is not applied (only modulation is considered), and ***scenario B***, when this measure is fully enforced[4]. This support is exempt from the modulation. Parameters used in the analysis are introduced in Table 2.

In the next step, we performed an impact analysis of the modulation at a regional level where 77 regions (counties, NUTS IV) were specified. These regions were clustered into 4 groups according to the total "degree"of modulation. The four groups[5] were created according to the quartiles for the variable of the total percentage of the direct payment reduction in the region (Table 5). Furthermore, the analysis of the variance with a post-hoc test (Sheffe test – Table 6) was applied to statistically test the characteristic differences between the particular groups of regions. Different indicators describe the structural, environmental and socio-economic characteristics. These characteristics show to what extent the reduction of direct payments can influence the regional economies given their specific structural, environmental and socio-economic position in relation to agriculture.

Since all funds derived from modulation in the case of the NMS supplemented by national co-financing will stay in the country, the redistributive effect (from pillar I to pillar II) among regions needs to be born

Table 1. Modulation rate of direct payments per farm for the EU member states (%)

Category of reduction	Zone of modulation	2010	2011	2012		2013	
		EU-15	EU-15	EU-15	**EU-10**	EU-15	**EU-10**
0–5 000 €	0th	0	0	0	**0**	0	**0**
5 000–300 000 €	1st	8	9	10	**0**	10	**10**
over 300 000 €	2nd	12	13	14	**4**	14	**14**

Source: Council Regulation (EC) No 73/2009

Table 2. Parameters for the impact assessment of modulation

	2010	2011	2012	2013
Exchange rate CZK/EUR	25.0	25.0	25.0	25.0
National envelope (EUR mio.)	654.2	739.9	832.1	909.3
National envelope (CZK mio.)	16 356.0	18 498.5	20 803.6	22 732.8
Finance for Article 68 = 10% of DP in 2013 (EUR mio.)	90.9	90.9	90.9	90.9
Finance for Article 68 = 10% of DP in 2013 (CZK mio.)	2 273.3	2 273.3	2 273.3	2 273.3
Utilised agricultural area (thousand ha)	3 513	3 513	3 513	3 513
SAPS (EUR/ha) without appl. of Article 68 (scenario A)	186.2	210.6	236.9	258.8
SAPS (EUR/ha) with appl. of Article 68 (scenario B)	160.4	184.7	211.0	233.0
SAPS (CZK/ha) without appl. of Article 68 (scenario A)	4 656	5 266	5 922	6 471
SAPS (CZK/ha) with appl. of Article 68 (scenario B)	4 009	4 619	5 275	5 824

Source: own calculation based on the Council Regulation (EC) No 73/2009

[4] The Czech policy representatives have the intention of using the maximum possible support for ruminants (3.5%) and for insurance support (other 3.5%).

[5] For the purpose of the paper, these are numbered from I to IV.

in mind. Such an impact will implicitly result from the increasing resources of the RD funds. However, the extent of this effect is difficult to estimate now as the specific proportion of released funds used in individual measures within the Rural Development Funds is not known yet.

RESULTS AND DISCUSSION

The results (Table 3) show that the modulation will affect nearly 92% of the operated agricultural land and 52% of farms in the case where the government decides not to apply zero support for the specific production according to the Article 68 of the mentioned Council Regulation in 2013. Over and above this, in the category over € 300 thousand, 880 farms which operate on approximately 24% of land will be affected by the reduction. This scenario shows the biggest impact of the modulation on the farms because all their direct payments are shortened in average by 10.1% – most of all scenarios and years. Looking at the scenario B when 10% of the total envelope of direct aid is used for specific production, the

Table 3. Impacts of modulation without application of the Article 69 according to size groups of farms in 2012 and 2013

	Category of reduction	Rate of reduction %	Number of farms		Area ths ha	Direct payments		Reduction of DP		Farm size ha
			no.	%		ths €	%	ths €	ths CZK	
2012	5 000–299 999 €	0.0	9 678	45.8	2 436.5	577 150	70.0	0	0	21.2–1 266
	over 300 000 €	4.0	775	3.7	731.6	173 299	21.0	6 932	173 299	>1 266
	Total under modulation	4.0	775	3.7	731.6	173 299	21.0	6 932	173 299	–
	Total for all farms	0.84	21 114	100	3 482.1	824 824	100	6 932	173 299	–
2013	0–4 999 €	0.0	10 175	48.2	294.8	76 313	8.5	0	0	0–19.3
	5 000–299 999 €	10.0	10 059	47.6	2 367.1	612 695	68.0	61 269	1 531 737	19.4–1 159
	over 300 000 €	14.0	880	4.2	820.2	212 306	23.6	29 723	743 071	>1 159
	Total under modulation	11.03	10 939	51.8	3 187.3	825 001	91.5	90 992	2 274 808	–
	Total for all farms	10.10	21 114	100	3 482.1	901 314	100	90 992	2 274 808	–

Source: own calculation based on database of direct payment recipients in 2007

Table 4. The impact of modulation with the application of the Article 68 according to payment intervals in 2012 and 2013

	Category of reduction	Rate of reduction %	Number of farms		Area ths ha	Direct payments		Reduction of DP		Farm size ha
			no.	%		ths €	%	ths €	ths CZK	
2012	0–4 999 €	0.0	11 290	53.5	340.2	71 778	9.8	0	0	0–23.6
	5 000–299 999 €	0.0	9 175	43.5	2 520.5	531 795	72.4	0	0	23.7–1 422
	over 300 000 €	4.0	649	3.1	621.4	131 120	17.8	5 245	131 120	>1 422
	Total under modulation	4.0	649	3.1	621.4	131 120	17.8	5 245	131 120	–
	Total for all farms	0.71	21 114	100	3 482.1	734 692	100	5 245	131 120	–
2013	0–4 999 €	0.0	10 758	51.0	317.7	74 005	9.1	0	0	0–21.4
	5 000–299 999 €	10.0	9 600	45.5	2 449.1	570 545	70.3	57 054	1 426 362	21.5–1 288
	over 300 000 €	14.0	756	3.6	715.3	166 632	20.5	23 329	583 213	>1 288
	Total under modulation	10.9	10 356	49.0	3 164.4	737 177	90.9	80 383	2 009 575	–
	Total for all farms	9.91	21 114	100	3 482.1	811 182	100	80 383	2 009 575	–

Source: own calculation based on database of direct payment recipients in 2007

total area under modulation would be only lowered by 0.6% (Table 4). The total amount of payments cut under the scenario A is CZK 2.3 billion in 2013. That amount has to be co-financed from the national budget in the case of the NMS by 10% if transferred to the pillar II. Hence the pillar II will be increased by CZK 230 million, which means CZK 2.5 billion available for the measures of the Rural Development Program. The reduced amount of direct aid under the scenario B is lower by "only" CZK 0.3 billion.

The differences between years 2012 and 2013 are significant because only the individual recipients receiving more than € 300 thousand are modulated by only four percent in 2012. Therefore, roughly only 20% of the area and nearly four percent of farms are impacted by the modulation under the scenario A.

Table 5. Selected characteristics of regional clusters

	Indicator	Regional clusters				*F*-value	Sign.
		1	2	3	4		
	Rate of direct payment reduction in 2013	x ≤ 9.52	9.52 < x ≤ 10.02	10.02 < x ≤ 10.45	x > 10.45		
	N° of regions in cluster (#)	20	19	19	19		
Structural	Share of corporate farms in UAA (%)	54.2	67.5	73.9	77.8	**14.671**	**0.000**
	Share of farms with collective decision making in UAA (%)	18.0	36.9	46.9	58.1	**15.183**	**0.000**
	Average farm size (ha)	117	169	200	223	**17.838**	**0.000**
	Share of grassland in UAA (%)	44.1	23.1	20.6	16.7	**7.778**	**0.000**
	Livestock density (LU of ruminants/ha UAA)	0.28	0.27	0.31	0.30	0.464	0.708
Agri-environmental	Natural conditions[1)] (numerical order)	29.4	41.5	39.7	44.0	**3.046**	**0.034**
	Landscape and biodiversity[2)] (%)	53.9	30.9	15.1	16.1	**6.544**	**0.001**
	Environmental senzitivity[3)] (numerical order)	183	177	129	143	**3.888**	**0.012**
	Share of UAA in LFA (%)	56.0	41.2	50.1	36.1	1.188	0.320
	Share of UAA in LFA-Mountain (%)	26.3	17.0	13.8	7.7	**2.643**	**0.056**
	Share of UAA in LFA-Others (%)	7.0	20.3	39.5	29.2	**5.506**	**0.002**
	Share of UAA in LFA-Specific (%)	24.8	6.2	1.3	2.7	**10.577**	**0.000**
	Share of grassland only in LFA in UAA (%)	63.3	44.7	39.4	35.2	**5.699**	**0.002**
Socio-economic	Proportion of employed workers in agriculture, forestry and fishery (%)	3.4	6.1	6.5	6.5	**6.020**	**0.001**
	Wage disparity in agriculture to industry (%)	79.3	83.3	86.0	84.9	**2.320**	**0.082**
	Unemployment rate (%)	9.2	7.6	7.7	7.3	1.175	0.325
	Proportion of workers commuting for their job out of the municipality where they live (%)	34.4	39.3	40.2	41.8	1.764	0.162
	Population density (inh./km^2)	299	226	112	178	0.864	0.464
	Share of population living in municipalities with >5 000 inhabitants (%)	65.7	51.7	48.0	46.6	**4.722**	**0.005**
	N° of municipalities per 100 km^2 (#)	6.2	8.3	8.7	8.7	**2.432**	**0.072**
	Rurality[4)] (numerical order)	32.7	42.2	39.5	41.9	**2.878**	**0.042**

Note: UAA = utilised agricultural area, LU = livestock unit, LFA = less favoured areas

Indicators expressed as numerical order are based on partial indicators: [1)] soil quality, yields, altitude, slope; [2)] expressed as the share of UAA and permanent grass in protected areas; [3)] natural conditions, water pollution, water retention; [4)] inhabitants/km^2 (–), urban inhabitants/total inhabitants (–), number of municipalities/100 km^2 (+), share of workers commuting to their jobs out of the municipality where they live (+), employed workers in agriculture (+)

Source: own calculation based on data from the CZSO, SZIF, and ÚZEI

The results of the scenario B are lower only by some percent. The average rate of direct payment reduction amounted to 0.84% and 0.71% under the scenario A and B, respectively.

It is worth mentioning that the direct payments modulation which was passed by the Ministers in comparison with the last two proposals of the EC is the most moderate not only for the Czech farmers but for all MS with a similar farm structure. The total rate of direct payment reduction is 4.7% lower than the former EC proposal made in November 2007 when the compulsory modulation and degressive reduction[6] were introduced. The passed version is also by 5.2% lower than the proposal from May 2008 under the degressive modulation[7]. This data indicates that some NMS particularly had succeeded in political negotiations about the final level of modulation.

We remind the readers that the following regional analysis was made under the scenario A – that is the exclusion of the Article 68, which gives the option to use (transfer) up to 10% of direct payments for the specific production (it is not known whether the option will be applied or not and under what conditions). For each of the 77 regions, structural, eight agro-environmental and eight socio-economic indicators were constructed (see Table 5). Using these indicators, we looked at the differences between the four categories (I– IV).

Cluster I will, in average, see a reduction of 8.9%, i.e. by € 23 per hectare (see Table 5 and Table 6 for comparison between clusters). Spatially, this cluster is situated in the North of the country, in the middle of Bohemia and North-East (see Figure 1). Cluster II will see total payments reduced on average by 9.9% and tend to be located in the Central, North and South Bohemia. The third regional cluster (III) will have their payments brought down by 10.2%. Regions from this cluster could be found particularly on the Czech-Moravian highland (middle of CR), in South Moravia and partially on the East of Bohemia. The regions which will see direct payments reduced the most – IV (in average by 10.7% or € 28 per hectare)

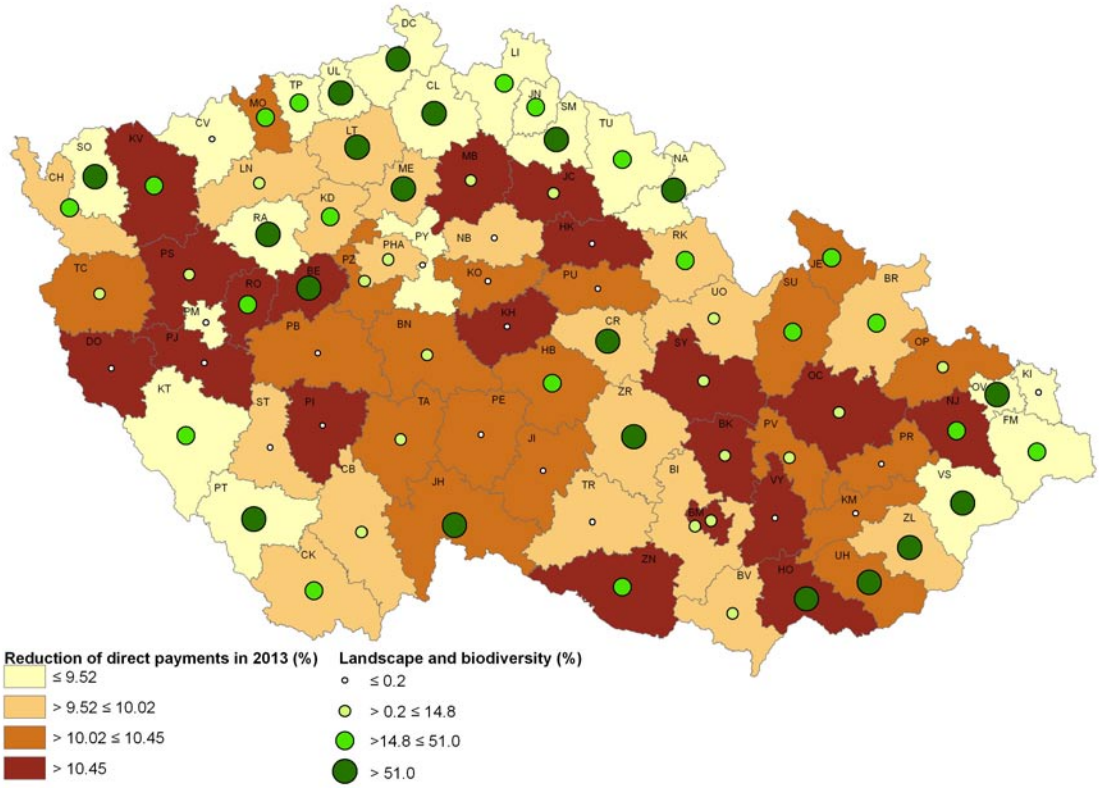

Figure 1. The relationship between the future reduction of direct payments (2013) and the quality of landscape and biodiversity

Note: Landscape and biodiversity: expressed as the share of the UAA and permanent grass in protected areas

[6] The rate of compulsory modulation was proposed at 13% and the degressive reduction of the direct payments after modulation was stated as follows - € 100 000–200 000: 10%, € 200 000–300 000: 25%, over € 300 000: 45%

[7] The rates of degressive modulation were proposed as follows - € 50 000–100 000: 13%, € 100 000–200 000: 16%, € 200 000–300 000: 19%, over € 300 000: 22%).

are to some extent situated in the most fertile regions (Central and South Moravia), further to the West and Middle-East Bohemia. In fact, the difference in the reduction between the two extreme counties is € 10 per ha of the utilized area (the Karviná and Vyškov counties).

As expected, the size of farms or the share of corporate farming differs strongly[8] (see Table 5). While in the regions seeing the most reduction (cluster IV) 78% of farms are classified as corporate farms (either as cooperatives, joint stock companies or limited liability companies), whilst in the regions seeing the least (cluster I) nearly half of the farms have the status of individual (family) farms. Likewise, the average farm size is nearly double between the two extreme clusters (I and IV), 117 ha and 223 ha, respectively.

From the natural conditions point of view, it can be seen that generally the region seeing the most reduction (compared to the least reduced regions) displays the best agronomic conditions. Yet, the regional cluster II has relatively good conditions as well. However, if some ecological limitations are considered (measured here as the proportion of land situated in protected areas), the result is more convincing. The regions

Table 6. Results of the Sheffe test for multiple comparisons between clusters

Compared clusters	Significance of multiple comparisons between clusters					
	1 : 2	1 : 3	1 : 4	2 : 3	2 : 4	3 : 4
Share of corporate farms in UAA (%)	**0.010**	**0.000**	**0.000**	0.446	**0.081**	0.800
Share of farms with collective decision making in UAA (%)	**0.031**	**0.000**	**0.000**	0.469	**0.014**	0.374
Average farm size (ha)	**0.014**	**0.000**	**0.000**	0.271	**0.011**	0.547
Share of grassland in UAA (%)	**0.015**	**0.005**	**0.001**	0.983	0.793	0.945
Livestock density (LU of ruminants/ha UAA)	0.999	0.836	0.970	0.777	0.942	0.980
Natural conditions[1)] (numerical order)	0.156	0.284	**0.058**	0.989	0.974	0.881
Landscape and biodiversity[2)] (%)	0.164	**0.003**	**0.005**	0.496	0.551	1.000
Environmental senzitivity[3)] (numerical order)	0.991	**0.046**	0.212	0.102	0.366	0.908
Share of UAA in LFA (%)	0.651	0.968	0.402	0.899	0.979	0.697
Share of UAA in LFA-Mountain (%)	0.593	0.338	**0.064**	0.975	0.612	0.852
Share of UAA in LFA-Others (%)	0.467	**0.003**	**0.075**	0.169	0.771	0.689
Share of UAA in LFA-Specific (%)	**0.003**	**0.000**	**0.000**	0.789	0.907	0.994
Share of grassland only in LFA in UAA (%)	0.115	**0.018**	**0.005**	0.918	0.673	0.954
Proportion of employed workers in agriculture, forestry and fishery (%)	**0.026**	**0.008**	**0.008**	0.981	0.979	1.000
Wage disparity in agriculture to industry (%)	0.543	0.120	0.253	0.815	0.956	0.983
Unemployment rate (%)	0.573	0.625	0.406	1.000	0.993	0.986
Proportion of workers commuting for their job out of municipality where they live (%)	0.558	0.412	0.205	0.995	0.916	0.976
Population density (inh./km^2)	0.945	0.491	0.799	0.830	0.985	0.959
Share of population living in municipalities with >5 000 inhabitants (%)	0.122	**0.028**	**0.015**	0.938	0.853	0.996
N° of municipalities per 100 km^2 (#)	0.297	0.171	0.163	0.991	0.989	1.000
Rurality[4)] (numerical order)	**0.096**	0.343	0.113	0.916	1.000	0.939

Note see Table 5

Source: own calculation based on data from the CZSO, SZIF and ÚZEI

[8] Differences between the "corporate farms"and the "farms with collective decision-making" is that the latter exclude the legal form of limited liability companies. That is to say these farms exhibit the characteristics and behavior patterns which are closer to individual farms despite their legal form.

with the most reduction (cluster IV) have more than three times lower proportion of protected areas. This is particularly linked to the fact that small farms tend to be located in mountainous and sub-mountainous regions with the prevailing landscape limitations. Beside other factors, this is closely related to the restructuring patterns; large-scale farming techniques can be more productively utilised on good soil with the prevailing arable land. Additionally, if environmental sensitivity is considered (measured through natural conditions[9], water pollution, and water retention) the relationship is consistent with the above mentioned indicators of landscape and biodiversity. In total, the share of less favoured areas (LFA) gives mixed results. If we look at the individual categories (mountainous, other and specific), the picture looks clearer: the regions with the highest reduction have a three-fold lower share of the mountainous LFA and nearly a ten-times lower share of the LFA-specific ecological limitations. Contrary to this, other LFA are the most frequent in the cluster III regions followed by the cluster IV. Only the cluster I has a significantly lower share of these LFA (7%). Hence, if the so-called other LFA were to be reduced under the proposed EU redefinition of these areas, the total effect of the modulation would be further intensified.

The rather poorer agricultural conditions in the regions which will see direct payments reduced the least suggest how important agriculture, from a purely economic point of view, is in those regions. There are more than twice as many workers in agriculture (incl. forestry and fishery) employed in the regions most reduced than in the regions seeing the least reduction. Yet, there is not any difference between the regional clusters III and IV. From the regional development point of view, there is a less convincing conclusion about the relation between rurality (economic development of a region) and the extent of the payment reduction.

Using a complex index to measure rurality (population density, urban density, urbanization, extent of commuting and agricultural employment) the cluster which is the least rural is the cluster I (with a lower payment reduction). Not surprisingly, the highest wage disparity between agriculture and the whole economy was faced by the regions in the cluster I. This is perhaps due to two factors: i) counties in the first cluster are relatively more urban regions with the income above the national average and ii) generally there is more extensive agriculture in the cluster I. Though there are not statistically significant differences between the individual clusters for population

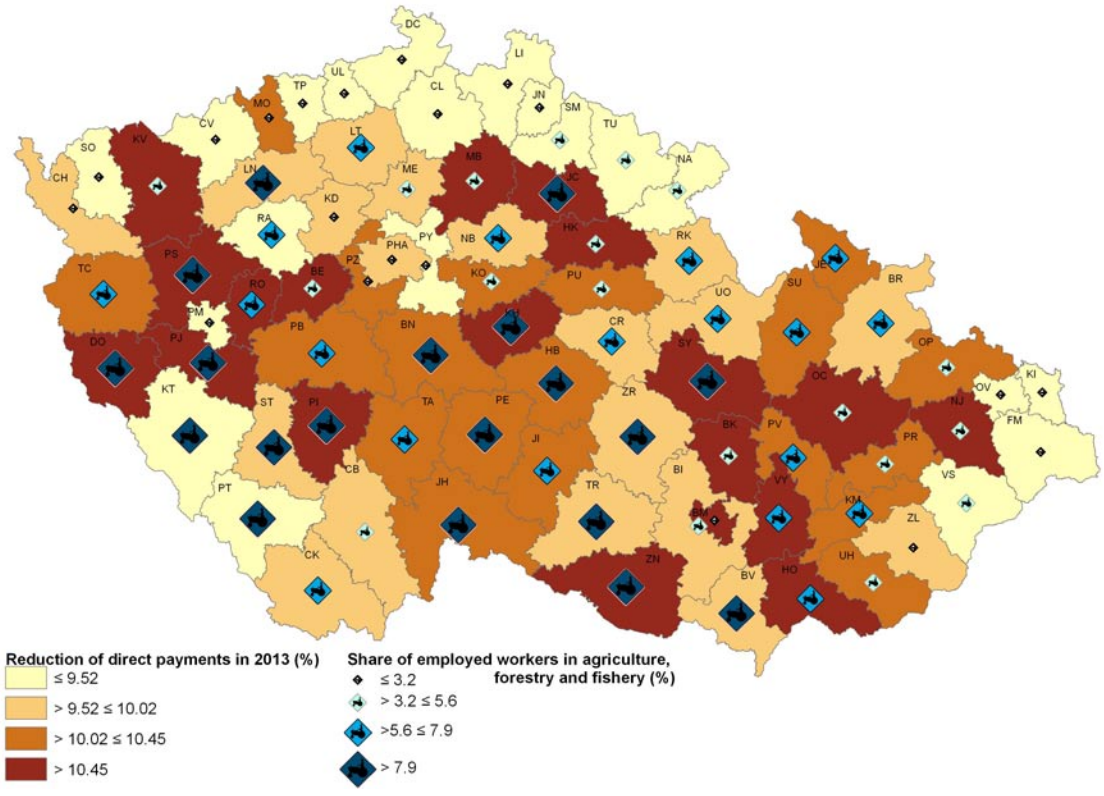

Figure 2. The relationship between the future reduction of direct payments (2013) and agricultural employment

[9] Index combining soil duality, yield, altitude and slope.

density, the regional clusters I and II are approximately more than by 1/3 more densely populated than the remaining two (III and IV).

CONCLUSIONS

The analysis confirmed that from the spatial point of view, modulation will impact regions with a varying intensity. Though it is not likely that the measure will pose a threat to any region in the terms of i.e. land abandonment, there are several clear messages that come from the analysis:

(i) The final version of direct payment modulation will affect the majority of (subsidised) agricultural land in the Czech Republic. Farmers' direct support will be reduced at the most by ten percent depending on the particular application of the Article 68. Indeed, this reduction is more moderate than the previous suggestions of the Commission.

(ii) However, modulation could have some positive implications as the saved funds will be redistributed and may be more targeted to the problematic areas. Direct payments shifted from the first to the second pillar will be oriented on three main issues: (a) strengthening the competitiveness respecting good agricultural and environmental conditions; (b) environmental issues, such as water and soil management and (c) diversification in non-farm activities. Thereby, some of the measures in the RD program will bring multiplicative effects and higher economic benefits for farms. Nevertheless, the analysis did not implicitly address the effect of the measures resulting from the strengthening of the budget to support (hopefully) positive externalities (via pillar II).

(iii) Due to the differences in farm sizes and structures, the regions will be affected to a different extent (the extreme difference may amount to 10 Euro per 1 ha of agricultural land which means the average county will see a cut of € 1 182 thousand).

(iv) The regions which will see the least reduction are characterised by a significantly large share of family farms in agricultural land (nearly half of the whole acreage), the largest share of grassland, the landscape with the highest environmental sensitivity (National Parks, Large and Local Landscape Protected Areas), the largest share of the so- called mountainous and specific less favoured areas, the smallest importance of agriculture, the largest agricultural wage disparity and the biggest share of population living in towns.

(v) on the other hand, the regions seeing the highest reductions were categorised by the following: corporate farming strongly prevailed with an average farm size far above the national average, the largest share of arable land, a minor share of less favoured area mountainous and specific but the largest share of the so-called other less favoured areas; the clearly smaller presence of environmental sensitive areas (National Parks and Landscape Protected Areas), the lowest farm income disparity and the smallest share of population residing in towns.

(vi) All the modulated finance will stay in the country and ten percent will be added as the national co-financing. All farms will have some opportunity to get this redistributed finance but each region has special conditions and thus the preconditions for disseminating this money will be regionally different.

(vii) Currently, the cross-compliance conditions require farmers to comply with certain, mainly environmental, regulations and as a reward for compliance, direct payments are provided. It is assumed that in more environmental sensitive regions, the costs of compliance with more standards will be higher. Hence, if these regions have their payments reduced less than the other ones, then the effect of modulation will not break the broader environmental objectives.

(viii) Another issue is the potential (administrative) division of farms. With respect to the above results, it is reasonable to expect that in the regions that see the highest reduction farms will be split up more often; beside administrative difficulties, this could bring them additional higher costs.

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