

# Comparison of agricultural subsidies in the Czech Republic and in the selected states of the European Union

## *Porovnání dotací do zemědělství v ČR a vybraných státech EU*

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**Abstract:** The Common Agricultural Policy has been implemented in order to guarantee the appropriate life quality for farmers and to preserve the European heritage. Costs of its realization amounted to 40% of the EU budget. The EU has not established the same conditions for all member states. The aim of the paper is to assess the influence of agricultural subsidies and the structure of production on the incomes of agricultural holdings and their comparison with the largest producers in the EU with similar production structure. The shift-share analysis is used. Different amount of subsidies according to the type of farming together with increasing subsidy rate may influence the type of farming. Therefore, it may cause a paradox that the structure of subsidies according to the type of farming will stimulate products that are currently suppressed. The difference in subsidies in comparison with the largest producers with a similar structure of agricultural production is significant for the Czech Republic and it is possible to compare it to the increase of the SAPS by 75%.

**Key words:** subsidies, costs, shift-share analysis, type of farming

**Abstrakt:** Společná zemědělská politika byla zavedena s cílem zaručit zemědělcům slušnou životní úroveň a zachovat evropské dědictví v oblasti zemědělství. Náklady na její realizaci představují 40 % rozpočtu EU. Ze strany EU nejsou nastoleny stejné podmínky pro všechny členské země. Cílem příspěvku je pomocí shift-share analýzy vyhodnotit vliv podpor v zemědělství a struktury zemědělské výroby na důchody zemědělských podniků a porovnání s největšími producenty v EU s podobnou strukturou výroby. Rozdílné dotace podle výrobního zaměření mohou se vzrůstajícími dotacemi působit na výrobní zaměření podniků. Paradoxem se může stát, že struktura dotací podle výrobního zaměření vyvolá oživení výroby těch produktů, které se v současné době utlumují. Rozdíl v dotacích ve srovnání s největšími producenty s podobnou strukturou zemědělské výroby je pro Českou republiku významný a lze jej přirovnat ke zvýšení SAPS o 75 %.

**Klíčová slova:** dotace, náklady, shift-share analýza, výrobní zaměření

In comparison with the developed European states, the competitiveness of the agrarian sector in the Czech Republic is low so far with the share of the export of food and animal per ha of agricultural area below the EU average. The competitiveness is under the influence of the following factors: price of product, cost per one unit of product, its quality, the degree of innovation, promotion and marketing. Labour productivity is closely related to the problem of competitiveness. Although the labour productiv-

ity in the Czech Republic is one of the highest in the new member states (NMS), it is quite low in comparison with the EU-15. Unequal conditions of the CAP between the EU-15 and the NMS reflected in the gradual levelling of subsidies to the level of the EU-15 in 2004–2013 are often discussed.

The aim of the paper is to use the shift-share analysis to assess the influence of subsidies in agriculture and the structure of agricultural production on the incomes of agricultural holdings, sustainability of

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farming in the Czech Republic and to compare the situation with the situation of the largest producers in the EU with a similar structure of farming.

Chrastinová, Burianová (2009) investigate the impact of the CAP on the economics of agricultural holdings. They conclude that the income within the Slovak agricultural sector has improved due to the inflow of the EU subsidies and most farms would generate losses without subsidies. Štolbová (2008) focuses on the LFA payments, their share in the total subsidies and international comparison. In the Czech Republic, the LFA support plays an important role for the creation of profit of the LFA agricultural enterprises. The share of the LFA payments in the Gross Farm Income in mountain area is at 20% and it is comparable with Slovakia and Lithuania; in Slovenia and Latvia, it is at 15%. Buchta and Buchta (2009) prove that the Sectoral Operational Programme Agriculture and Rural Development has been one of the most utilised programmes in Slovakia. The beneficiaries of subsidies achieved a faster rate of growth of income and labour productivity and the support contributed to the mitigation of the decline in employment and helped to preserve the employment in agriculture.

In anticipation of the entry into the EU, many countries in Central and Eastern Europe have adopted certain EU laws directly, and even implemented many of the EU's agricultural policies, although their subsidy levels generally remained below those in the EU. Despite of the implementing the *acquis*, economic success in agriculture has not followed – the needed policies do not seem to work as well as they do in Western Europe. One reason is that the level of social capital is lower in the New Members States than in the EU-15 and it needs time to build up, so the benefits of policy changes are not as strong as they are in the EU (Slangen et al. 2004). Bielik et al. (2007) analyze the differences in agricultural support policies between the OECD and the EU countries using the indicators of the Production Subsidy Equivalent, the Consumer Subsidy Equivalent, the Total Subsidy Equivalent and the Nominal Assistance Coefficient. The PSE in the OECD countries decreased from the level of 37% in the period 1986–1988 down to 30% in the period 2002–2004. Kleinhanss et al. (2007) look for relations between subsidies and factors such as the farm size, efficiency, and the environmentally friendly behaviour using the Data Envelope Analysis. Based on German and Spanish data from the FADN, in average direct payments generally tend to increase the efficiency. In general, the direct payment system is not sufficient to compensate the fact that the less environmentally friendly farms as well as the larger

farms are more efficient. Anders et al. (2004) use four measures of producer support for the regional analysis of primary effects of the CAP. Using 26 regions in the Federal State of Hesse, Germany, they conclude that the uniform CAP does affect the regions very differently.

## METHODOLOGY

The shift-share analysis was used in Dunn (1960) for the first time and it was aimed at the analysis of the employment dynamics. It is possible to analyse either the employment (Dinc, Haynes 1999; Blien, Wolf 2002; Riguelle et al. 2007; Bielik, Rajčániová 2008), the value added (Esteban 2000), labour productivity (Maudos et al. 2008) or other variable. The analysis of any variable by this method is always aimed at one of the following aspects:

- assessment of the dynamics and structural changes of a variable according to sectors;
- assessment of structural changes of a variable according to sectors and regions.

Maudos et al. (2008) express changes in labour productivity by static sectoral effect based on the reallocation of resources into more productive sectors. The dynamic sectoral effect is based on the analysis of the growth rate of sectors with a higher labour productivity. The difference in labour productivity of two periods is explained by the intra sectoral effect, the static sectoral effect and the dynamic sectoral effect. The static and dynamic sectoral effects are integrated into the structural change effect. The method is based on the decomposition of changes in labour productivity by the decomposition with a remainder. The analysis included 47 sectors in the EU-15 and the USA. Esteban (2000) presents a static shift-share analysis that assessed the multi-sectoral structure of labour productivity and regional differences. This method was used to analyse labour productivity of the EU states. Knudsen (2000) extends the knowledge of the shift-share analysis by the proportional component and at the same time he investigates relations of the traditional shift-share analysis and the use of the analysis of variance within this method. Ezcurra et al. (2007) describe regional differences in productivity in the EU states with the Gini index and the Theil index. Their paper assesses the shares of structural, regional and allocative productivity components.

The international comparison of subsidies may be based on the Farm Accountancy Data Network (FADN) on the operational subsidies (SE605-Total

subsidies-excl.investm.-c.u.) and agricultural area (SE025-Total Utilised Agricult. Area-ha); agricultural sectors may be classified according to TF8 for 2006 with the use of the following indicators:

$p_i^j$  = share of the area of land in sector  $j$  in region  $i$

$$\sum_j p_i^j = 1$$

$p^j$  = share of the area of land in sector  $j$  in selected states

$$\sum_j p^j = 1$$

$x_i^j$  = operational subsidies per ha in sector  $j$  in region  $i$

$x^j$  = operational subsidies per ha in sector  $j$  in selected states

$x_i$  = operational subsidies per ha in region  $i$

$$x_i = \sum_j p_i^j x_i^j$$

$x$  = operational subsidies per ha in selected states

$$x = \sum_i \sum_j p_i^j x_i^j = \sum_j p^j x^j$$

It is possible to include the following three components between the subsidies per ha in the region  $i$  ( $x_i$ ) and subsidies per ha in selected states ( $x$ ):

– industrial mix component

$$\mu_i = \sum_j (p_i^j - p^j) x^j$$

– productivity differential component

$$\pi_i = \sum_j p_i^j (x_i^j - x^j)$$

– allocative component

$$\alpha_i = \sum_j (p_i^j - p^j)(x_i^j - x^j)$$

There is the following relation of components:

$$x_i - x = \mu_i + \pi_i + \alpha_i$$

It is possible to decompose the variability in a similar way:

$$\sigma^2(x_i - x) = \sigma^2(\mu_i) + \sigma^2(\pi_i) + \sigma^2(\alpha_i) + 2 \text{cov}(\mu_i, \pi_i) + 2 \text{cov}(\mu_i, \alpha_i) + 2 \text{cov}(\pi_i, \alpha_i)$$

It is useful to compare the following relations in order to assess the importance of the variability of each component:

$$\frac{\sigma^2(\mu_i)}{\sigma^2(x_i - x)}, \frac{\sigma^2(\pi_i)}{\sigma^2(x_i - x)}, \frac{\sigma^2(\alpha_i)}{\sigma^2(x_i - x)}, \frac{2 \sum \text{cov}}{\sigma^2(x_i - x)}$$

The following equations are used to assess the relation of the difference in subsidies per ha in a region and subsidies per ha in the selected states to each component:

$$x_i - x = a_\mu + b_\mu \mu_i + \varepsilon_\mu$$

$$x_i - x = a_\pi + b_\pi \pi_i + \varepsilon_\pi$$

$$x_i - x = a_\alpha + b_\alpha \alpha_i + \varepsilon_\alpha$$

In our paper, we employed the data of the FADN public database and the classification of farms according to the type of farming based on the economic category of standard gross margin. The standard gross margin reflects the economic contribution of a production unit in each sector of livestock and crop production. It is set per ha of each crop in crop production and per one head of livestock. Its value is equal to the value of output from one hectare of a crop or one animal less the variable costs (The Farm... 2009). The standard gross margins are defined in the states of the EU for all crops and animals according to real conditions of the state and are updated regularly.

The outcome compares the biggest producers in the EU that are close to the Czech Republic according to the type of farming: (1) field production, (5) milk production, (6) other grazing livestock, (7) granivores, (8) mixed.

## RESULTS AND DISCUSSION

According to the OECD estimate, the total agricultural subsidies in developed countries amounted to approximately 30% of gross agricultural incomes. The OECD compares the member states according to the Producer Support Estimate (former Producer Subsidy Equivalent – PSE) that measures the support and protection of agricultural producers expressed as a percentage of the total value of agricultural output. The gross PSE = Market Price Support (MPS) + Direct payment – Levies on output + other support  
The net PSE = gross PSE – feed support  
Percentage of the PSE = PSE (gross or net)/(total value of output = quantity × price of a unit + direct payment – levies on output).

States are classified into three groups according to the PSE. The first group consists of states with the PSE of 50 and more percent. This group includes two European states: Switzerland and Norway. Norway is a typical Scandinavian state. Switzerland with more than half of gross domestic product from tourism pays a high PSE on maintaining the landscape. The majority of European states has the PSE of 20%. Mexico, the USA, Australia and New Zealand have the low PSE (Figure 1).

### The selection of states for comparison within the EU

The biggest producers represent 55.1% of the total agricultural production in the EU; 18.2% of which is France, 13.2% Germany, 12.6% Italy and 11.1% Spain.

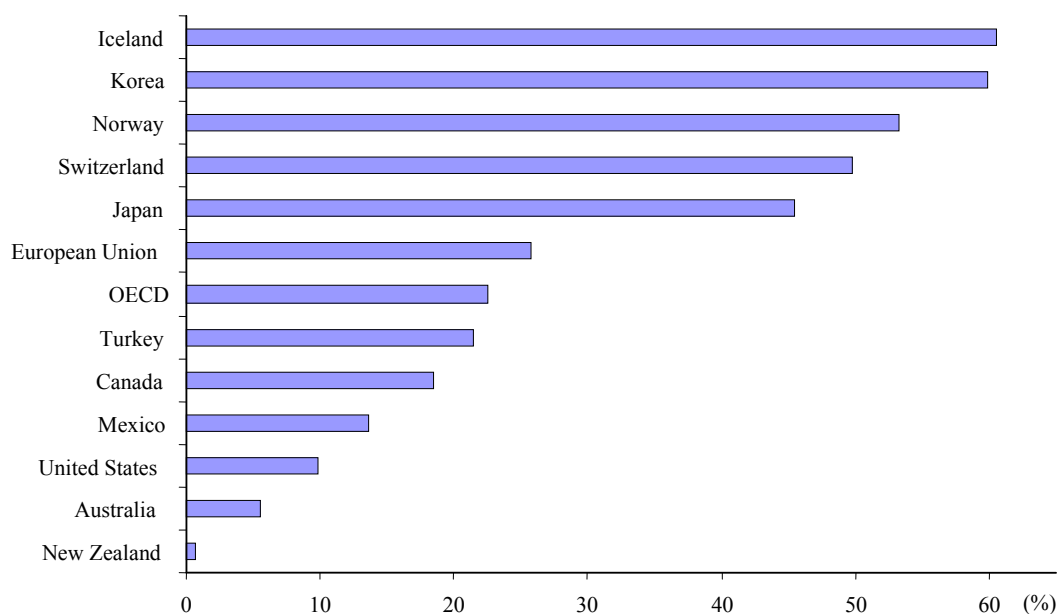


Figure 1. PSE share in the total production in 2007

Source: OECD

Together with the Netherlands, Great Britain and Poland, their share in the total production in the agriculture of the EU amounts to 73.5%.

Comparison of the type of farming in each state revealed that Germany, France, Poland and Great Britain are the most similar to the type of farming in the Czech Republic. The production of three main commodities represents roughly 50% of total output.

The production in Germany is specialized at milk, cereals and fodder crops (47.1% of total agricultural production); production in France is specialized at milk, cereals and cattle with 41.9% of total production and production in Great Britain is specialized at cattle, cereals and milk with 50.2% of total agricultural production. The above mentioned states (France, Germany, Poland and Great Britain) are suitable for a comparison of the economic results in agriculture with the Czech Republic. These states are the main

producers in the EU and they have a structure of agricultural production comparable with the Czech Republic. The comparison of the impact of subsidies on the profit/loss in these states is more factual than the comparison with the EU.

#### Comparing the economic results and the impact of subsidies

The evaluation of the LFA and the NON-LFA should consider two factors. The share of the LFA in the total area is similar in all states. Germany, the Czech Republic and Great Britain have 50–53% of LFA in the total agricultural area. There are more significant differences comparing France (45%) and Poland (63%). The support within the LFA can be assessed also according to the comparison of the types of farming. It is possible to predict that the production of milk and cattle will have a higher share of the LFA.

Table 1. Basic economic results of the selected European states

	AWU/100ha	Production (EUR/ha)	Costs (EUR/ha)	NVA/AWU (EUR/AWU)
Czech Republic	3.51	1 121	1 272	10 992
Germany	2.82	2 252	2 223	31 079
France	2.56	1 692	1 652	27 168
Poland	10.28	1 344	1 071	6 028
Great Britain	1.50	1 308	1 376	33 955

Source: FADN

Let us assess the basic economic indicators in these states at first, i.e. the number of workers (AWU) per 100 ha of agricultural area, labour productivity expressed as net value added per 1 annual work unit (NVA/AWU) and the family farm income.

There is a high share of workers per 100 ha in the Czech Republic and in Poland compared to Germany and France where it is lower by 20% and 27% respectively (Table 1). The high number of workers per 100 ha is one of the reasons for the low labour productivity. Labour productivity in the developed states of the EU (Germany, France and Great Britain) is approximately 3 times higher in comparison with the Czech Republic. Combined with higher subsidies, it influences a significantly lower profit/loss of agricultural holdings in the Czech Republic.

### Structure of subsidies in the selected states of the EU in 2006

Operational subsidies in all states with the exception of Poland covered about 20% of cost of agricultural production (Table 2). There is a certain discrepancy not matching the expectation that higher subsidies in each state covered a lower share of costs. It could be misleading to assess subsidies according to their share per 1 ha only. The difference may be explained

by the fact that the total costs per 1 ha are higher in the developed states.

The cost on fertilisers is one of the main cost items taking share in the total costs. This cost is almost double in comparison with the Czech Republic. There were also higher depreciation costs – 2.8 times higher in Germany; 1.46 times higher in Britain and 2.9 times higher in France in comparison with the Czech Republic. Compared to the Czech Republic, there is no efficient substitution between labour and capital as the increase of depreciation costs is not balanced by a decrease of labour costs, however, it is adjusted by the increase of the average wage of workers in agriculture. Rental costs are high as well – the value of these costs is more than double in comparison with the Czech Republic. The rental costs are 4.2 times higher in Germany, 3.5 times higher in France and 1.8 times higher in Britain (Table 3).

The average investment subsidies in the Czech Republic amounted to 6.1 EUR per 1 ha of agricultural area. There is a higher subsidy in France (19.1 EUR per ha). Within the states in our investigation, the subsidy on the LFA was the highest in the Czech Republic. The average environmental subsidy amounted to 30 EUR per 1 ha in the Czech Republic, 40 EUR per 1 ha in Germany and 38 EUR in Great Britain.

Table 2. Structure of subsidies in the selected states of the EU in 2006

Country	Share of area in LFA (%)	Operational subsidies (EUR/ha)	LFA subsidies (EUR/ha)	Share of operational subsidies in costs (%)	Family farm income (EUR/ha)
Czech Republic	50	258	27	20.3	98
Germany	52	416	19	18.7	430
France	45	372	19	22.5	407
Poland	63	284	25	26.5	525
Great Britain	53	298	12	21.6	229

Source: FADN

Table 3. The main costs in agriculture of the selected European states in 2006 (EUR/ha)

Country	Total costs	Fertilizers	Depreciation	Wages	Rent	Interests	Taxes
Czech Republic	1 272.5	62.8	108.8	245.8	35.9	12.9	14.7
Germany	2 222.8	103.3	304.5	203.3	152.4	66.5	24.9
France	1 652.1	104.1	312.1	127.7	125.1	53.4	23.7
Poland	1 070.7	96.0	203.9	52.5	9.9	11.8	13.3
Great Britain	1 376.5	77.3	159.2	175.3	65.8	46.4	6.9

Source: FADN

## Subsidies according to the type of farming

It is useful to notice the importance of subsidies in farms with the same type of farming. The choice of the type of farming was based according to the TF8 classification of the FADN. We assessed the main types of production, i.e. farms specialized in (1) field crops, (5) milk, (6) other grazing livestock, (7) granivores and (8) mixed production.

### Field crops

Subsidies of farms specialized in field crops and their impact on the economic results are presented in the Table 4.

Low family farm income of farms specialized in field crops in the Czech Republic is followed by a significantly slower reproduction of production funds in comparison with the other states. The coefficient of the assets renewal is very low (Figure 2).

Within states in our sample, the lowest operational subsidies of farms specialized in field crops were in the Czech Republic (224 EUR per ha). The share of the subsidies in costs was lower by 2.3 percentage points in comparison with Germany; by 10 percentage points compared to France and by 3.4 percentage points in comparison with Great Britain. Adjusting the results of farms in the Czech Republic according to German subsidies, the family farm income would amount to 72% of the German incomes. The same

Table 4. Structure of subsidies of farms specialized in field crops in 2006

Country	Total subsidies (EUR/ha)	LFA subsidies (EUR/ha)	Share of subsidies in costs (%)	Family farm income (EUR/ha)
Czech Republic	228	6.0	20.5	85
Germany	355	5.4	23.1	266
France	375	1.7	30.5	297
Poland	264	16.0	35.0	387
Great Britain	330	0.2	24.2	292

Source: FADN

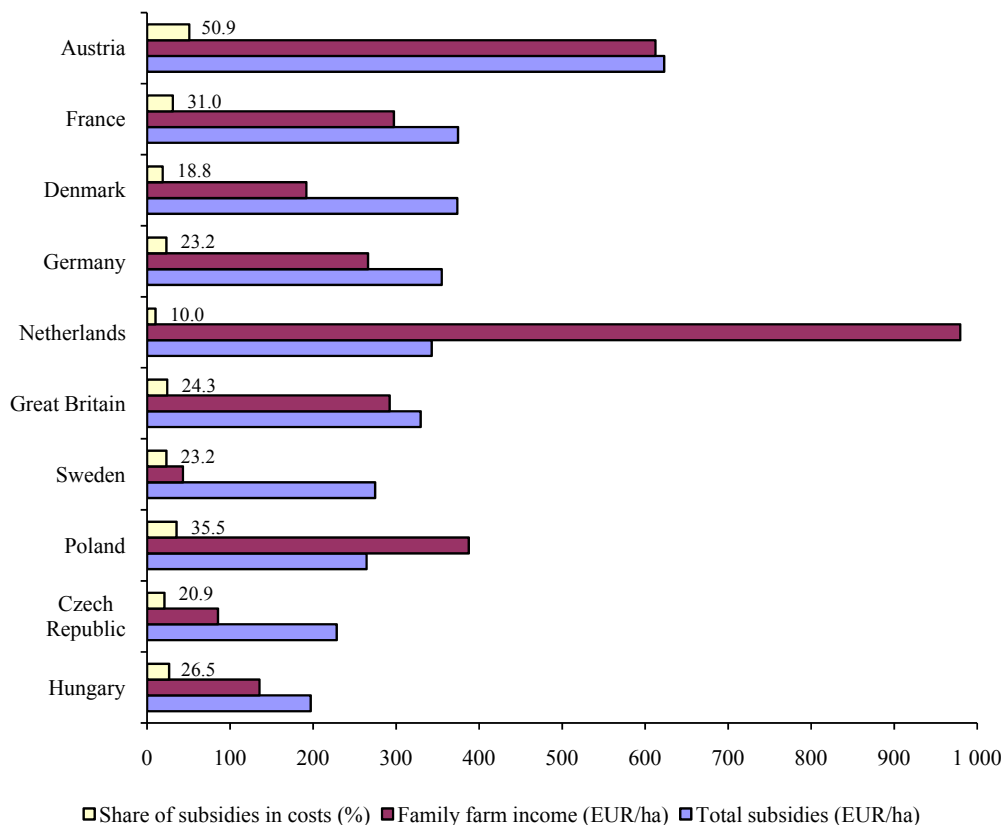


Figure 2. Subsidies of farms specialized in field crops

Source: FADN

Table 5. Structure of costs on field crops of the selected states in the EU in 2006 (EUR/ha)

Country	Total	Seeds and plants	Fertilizers	Crop protection	Other crop specific costs	Depreciations	Wages	Rent	Interests	Taxes
Czech Republic	1 094.0	71.3	81.3	84.4	9.2	105.0	196.6	42.3	10.3	15.9
Germany	1 530.1	95.4	123.7	120.8	27.5	204.7	156.1	154.3	45.2	19.6
France	1 208.2	77.7	136.8	126.4	5.9	228.8	71.0	114.4	36.7	20.9
Poland	745.2	58.0	116.9	64.3	14.4	161.2	53.5	12.2	10.9	15.1
Great Britain	1 356.7	76.5	115.7	126.8	56.8	182.0	163.3	97.7	51.6	9.8
EU	1 088.4	85.3	102.5	84.3	24.1	183.1	96.0	85.6	35.8	16.4

Source: FADN

adjusting according to France gives that the farm income of Czech farms would amount to 78% of French incomes. Levelling subsidies of farms specialized in field crops will not be enough to reach the equalization of incomes.

As in the case of total agricultural production, the costs of field crops in the selected states calculated per 1 ha of agricultural area were significantly higher than in the Czech Republic influencing the same items (Table 5).

### Milk production

Farms specialized in milk production had the lowest subsidies in the Czech Republic and in Poland,

although these subsidies covered the greatest share of cost there (28.2% in the Czech Republic; 38.5% in Poland).

The total subsidies per 1 ha within the farms specialized at milk production were 1.92 times higher in Germany than in the Czech Republic. It was under the influence of the costs of feed, depreciation, rents and interests. The comparison with France revealed similar results but the difference was not so significant. In Poland, the costs were mostly significantly lower compared to the Czech Republic followed by a significantly better profit (Figure 3).

Actually, the high share of subsidies for milk in the total costs of milk in Czech agriculture is caused by significant differences in the total costs. On the

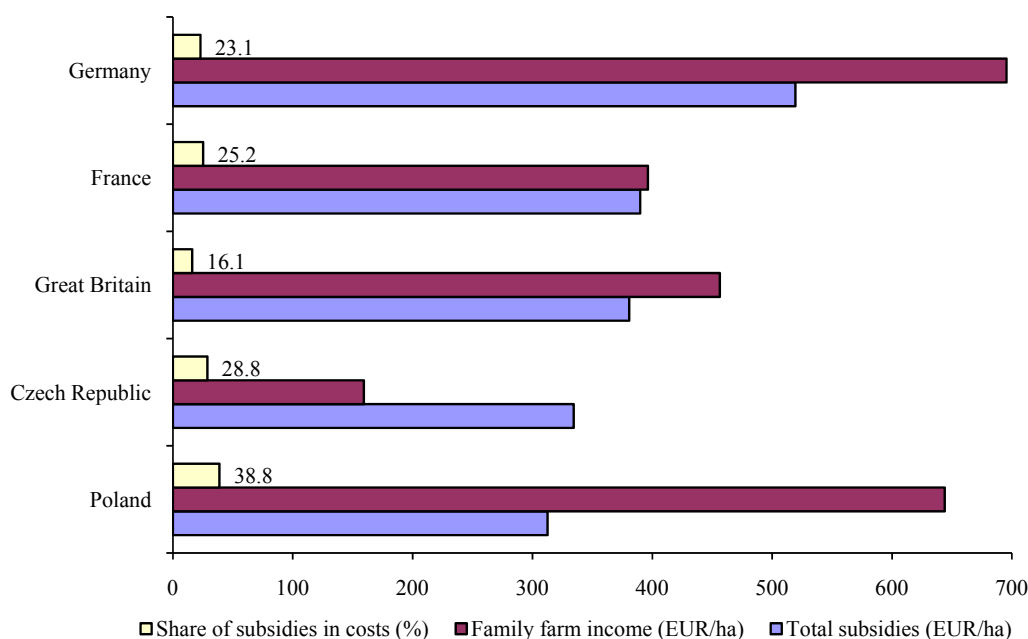


Figure 3. Subsidies of farms specialized in milk

Source: FADN

other hand, there are significantly higher wage costs per 1 ha in this sector in the Czech Republic and in Poland.

The difference between the extremely low wage per 1 AWU and the high wage cost per 1 ha in milk production is caused by the high number of workers per 1 ha. The insufficient substitution of labour and capital causes a discrepancy between the annual wage per 1 AWU and the share of wage costs per 1 ha (Figure 4).

### Farms specialized in other grazing livestock

Farms specialized in other grazing livestock had the highest conversion ratio between the volume of subsidies and the share of subsidies in the total costs. There were the third lowest subsidies per 1 ha within

this category (393 EUR/ha) in the Czech Republic. The total subsidies were higher by 32% in Germany and by 6% in France. The share of the total subsidies in costs ranged between 35.4% and 42.5% in the selected countries. In the Czech Republic, the costs were covered by subsidies in 66.8%. It is a reflection of the total costs (Figure 5).

The extremely high share of subsidies in costs is caused by the fact that the Czech Republic has low costs of other grazing livestock breeding in comparison with other states. Although the above mentioned share is high, the Czech Republic had the second lowest farm income. The structure of costs revealed that the highest share of cost for grazing livestock in the Czech Republic consisted of feed costs (42%) – both own and purchased – and wage costs (16.5%). In Germany, almost all categories of

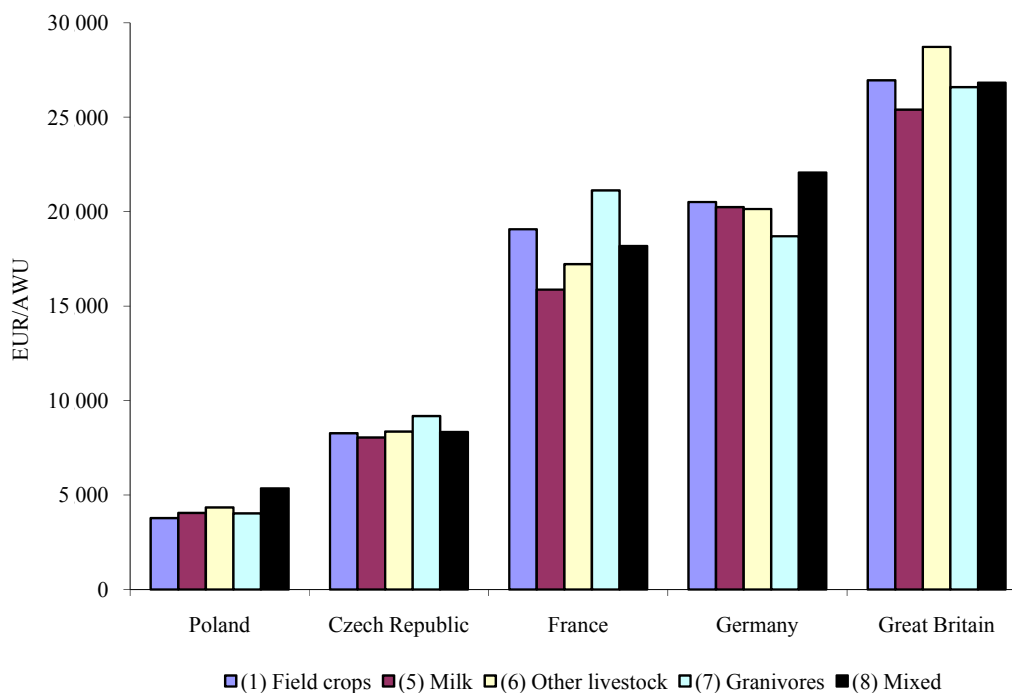


Figure 4. Annual wage costs per 1 paid AWU in 2006

Source: FADN)

Table 6. Structure of costs on milk production in the selected states in the EU in 2006 (EUR/ha)

Country	Total costs	Feed	Depreciation	Wages	Rent	Interests	Taxes
Czech Republic	1 162.1	530.5	107.4	246.7	17.2	12.4	10.3
Germany	2 252.6	599.4	385.2	95.6	155.0	78.3	22.7
France	1 549.5	310.3	343.5	22.6	102.3	52.7	20.0
Poland	805.2	334.4	178.2	9.5	7.6	9.1	8.4
Great Britain	2 357.5	828.9	261.1	194.4	81.4	96.4	6.4

Source: FADN



costs were higher. France and Great Britain had all costs higher with the exception of feed and wages. The structure of costs in Poland was similar to the Czech Republic with the exception of wage costs (4.5 times lower).

### Farms specialized in granivores

Czech farms specialized in granivores had the highest subsidies calculated per 1 ha of agricultural area due to a large share of farms without agricultural area in this category. The density of animals per 1 ha was significantly greater in the Czech Republic, it amounted to 40 LU/ha that was 2 times more in

comparison with Great Britain, 3 times more than in France, 8 times more than in Germany and 14 times more compared to Poland. For this reason, it is useful to compare the selected indicators calculated per the number of livestock units (Figure 6). Czech farms with this type of production had the lowest family farm income and the second lowest subsidies while the lowest subsidies were in Great Britain.

The share of subsidies in the total costs of farms specialized in granivores was significantly lower in comparison with other types of production ranging from 1.5 to 10.3%. The Czech Republic had average costs of granivores production. These costs were higher in Germany and in Poland. The highest share

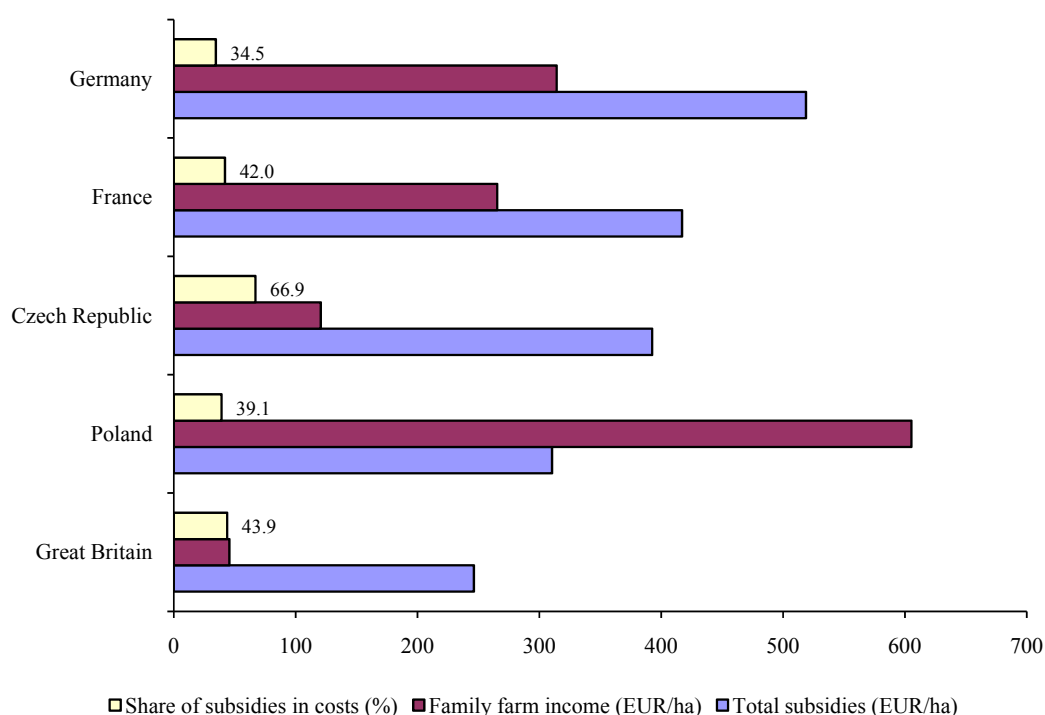


Figure 5. Subsidies of farms specialized in grazing livestock

Source: FADN

Table 7. Structure of costs in farms specialized in grazing livestock in 2006 (EUR/ha)

Country	Total costs	Feed for grazing livestock	Other livestock specific costs	Depreciation	Wages	Rent	Interests	Taxes
Czech Republic	586.4	246.0	20.1	57.9	96.9	15.4	11.6	6.6
Germany	1 503.7	356.8	63.7	231.0	87.6	98.9	52.2	18.7
France	993.0	205.9	44.7	227.5	17.7	70.2	33.2	11.7
Poland	793.0	313.3	49.4	163.9	21.4	9.7	13.0	7.5
Great Britain	561.5	111.2	87.6	80.8	49.2	27.8	18.2	4.2

Source: FADN

of their structure consisted of the purchased feed. The Czech Republic and Great Britain had a high share of wage costs; Germany and France had a high share of depreciation (Table 8).

### Farms with mixed type of production

Farms with mixed type of production obtained 65–75% of the total subsidies of the most important producers. The differences were not so significant as for other types of production with subsidies covering 18 to 32% of costs. The total costs of production were higher by 77% in Germany and by 24% higher in France so that the share of subsidies was lower by 2.8 percentage points in Germany compared to the Czech Republic (Figure 7). High costs of the main producers were influenced by fertilizers, deprecia-

tion, rents and the insufficient substitution of labour and capital (Table 9).

### Analysis of subsidies according to the individual sectors

This analysis was performed within the following sectors: field crops, milk, other grazing livestock (cattle with the exception of milk cattle; sheep and goat), granivores, mixed crop and livestock production.

Table 10 presents operational subsidies calculated per 1 ha of agricultural area in the selected states of the EU in 2006 according to the above mentioned types of farming. Comparing operational subsidies in the selected sectors revealed that the Czech Republic represented 74% of the average in the selected states.

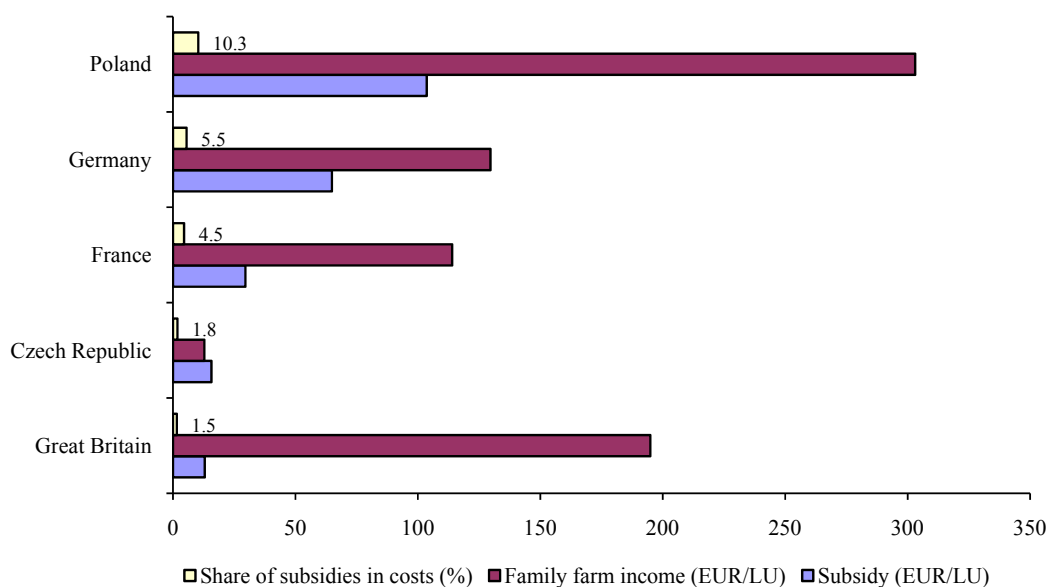


Figure 6. Subsidies of farms specialized in granivores

Source: FADN

Table 8. Structure of costs in farms specialized in granivores in 2006 (EUR/LU)

Country	Total costs	Purchased feed for pigs and poultry	Own feed for granivores	Other specific costs of livestock production	Depreciation	Wages	Rent	Interests	Taxes
Czech Republic	885.6	472.6	4.8	73.6	55.6	132.4	2.9	6.3	3.7
Germany	1 176.5	433.1	51.5	80.4	131.4	48.2	43.9	37.8	7.6
France	654.4	333.3	12.1	35.5	77.1	25.2	10.7	19.1	4.2
Poland	1 005.4	634.2	110.7	47.1	97.9	20.6	3.6	8.3	5.5
Great Britain	839.5	404.1	4.8	98.4	53.6	108.0	12.6	19.5	1.1

Source: FADN

The fall is the most significant in the case of the comparison with Germany; the share of subsidies per 1 ha of the Czech Republic represented 62% of subsidies in Germany. The greatest fall in operational subsidies appeared in field crops, milk production and mixed production with 64% of the total subsidies in

Germany. On the other hand, subsidies in granivores (pigs and poultry) calculated per ha were the highest in the Czech Republic. The situation is caused by the low agricultural area of such farms in the Czech Republic with 2 to 14 times higher share of LU/ha compared to the other states.

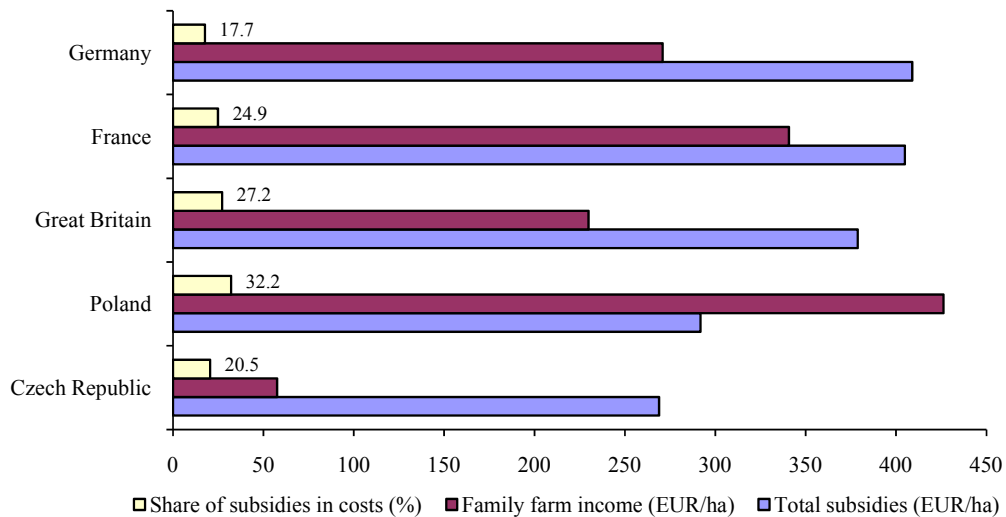


Figure 7. Subsidies in farms with mixed production

Source: FADN

Table 9. Structure of costs of farms with mixed production in 2006 (EUR/ha)

Country	Total costs	Other specific costs of crop production	Other specific costs of livestock production	Depreciation	Wages	Rent	Interests	Taxes
Czech Republic	1 310.6	169.5	931.8	98.9	280.5	31.5	14.6	13.5
Germany	2 315.7	279.5	607.8	285.7	210.8	144.9	57.8	21.5
France	1 625.7	220.6	320.6	320.8	38.4	105.5	56.6	18.7
Poland	906.6	157.9	599.1	177.4	28.4	7.7	6.6	12.1
Great Britain	1 392.8	182.7	477.8	160.8	153.5	78.0	49.0	5.0

Source: FADN

Table 10. Operational subsidies in 2006 (EUR/ha)

	Field crops (1)	Milk (5)	Other grazing livestock (6)	Granivores (7)	Mixed (8)	Selected sectors total
Czech Republic	224	327	392	495	261	259
Germany	353	513	517	344	404	417
France	368	365	394	397	388	378
Poland	261	310	307	295	290	284
Great Britain	328	368	239	271	375	299
Selected states	333	411	331	320	352	348

### Use of the shift-share analysis

Productivity differential component gives the differences in the level of subsidies of a state in comparison with the average subsidies in selected states with the average structure of production in the selected states.

The total subsidies were lower by 59 EUR in the agricultural production of the Czech Republic in comparison with the average of the selected states; by 42 EUR in case of the field crops, by 22 EUR in case of the mixed production and 12 EUR in case of milk production. Farms specialized in other grazing livestock and granivores only were above the average of the selected states (Table 11). Compared to Germany with subsidies higher than the average by 75 EUR, the difference amounted to 134 EUR (approximately 3 500 CZK).

Figure 8 reveals a strong linear dependence between the productivity differential component and variation

of subsidies from its average ( $x_i - x$ ) characterized by a high correlation coefficient;  $r = 0.983$ . The productivity differential component explained a significant portion of variations in the selected states from the average. The share ranged between 97% to 109% with the exception of the Czech Republic and Great Britain. The variance of the productivity differential to the variance of subsidies in the selected states from the average revealed the same outcome. The above mentioned share amounted to 79%. Different level of subsidies in different states is the most important factor of the shift-share analysis.

**The industrial mix** component expresses the influence of differences in the structure of subsidies with the average subsidy in the selected states.

Due to the similar structure of sectors in the selected states, the difference among the states was not so significant. The Czech Republic had lower subsidies by 3.76 EUR in all investigated sectors due to the less convenient structure than it would be in case of the

Table 11. Productivity differential component (EUR/ha)

Country	Field crops (1)	Milk (5)	Other grazing livestock (6)	Granivores (7)	Mixed (8)	Productivity differential component
Czech Republic	-41.65	-12.16	12.92	3.55	-21.91	-59.26
Germany	7.70	14.78	39.48	0.49	12.62	75.07
France	13.51	-6.74	13.43	1.56	8.59	30.35
Poland	-27.54	-14.75	-5.17	-0.52	-14.80	-62.78
Great Britain	-1.75	-6.21	-19.61	-1.00	5.43	-23.14

Source: FADN, own calculation

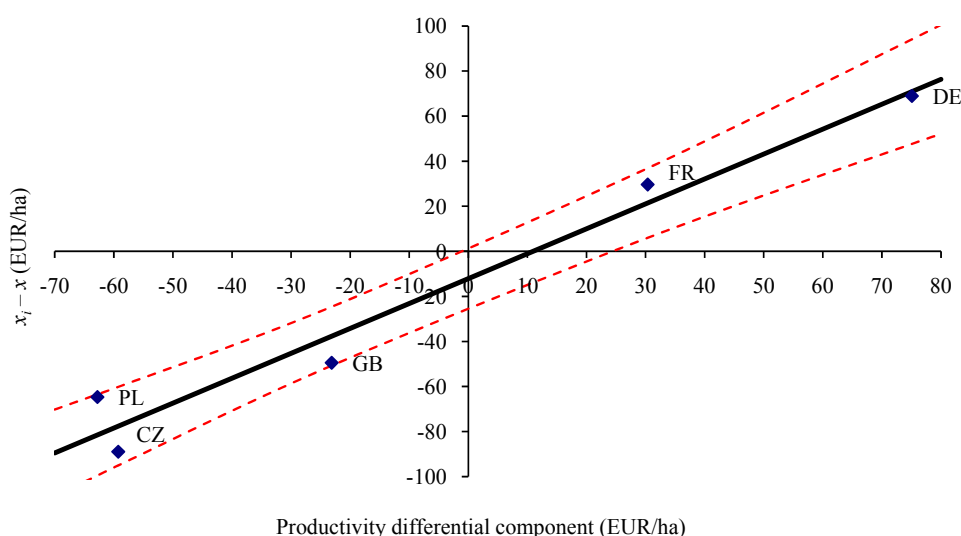


Figure 8. Relation of the productivity differential component and variations of subsidies from the average of the selected states

same structure as in the selected states of the EU (Table 12). Notice that the significant differences appeared in the case of milk production, cattle and granivores. The industry mix component also revealed a high dependence to the total differences; expressed by the correlation coefficient of  $r = 0.906$ . The high regression coefficient ( $b_{\mu} = 12.037$ ) expresses an important influence of the industry mix component to the total differences (Figure 9). Low share of  $\sigma^2(\mu)$  on  $\sigma^2(x_i - x)$  is given mainly by the different metric of components.

The allocative component expresses the influence of both the productivity differential component and the industry mix component. The mutual influence of disadvantageous sectoral structure with relation to subsidies and lower subsidy rate caused for the selected products within the Czech agriculture the loss of 26 EUR (approximately 676 CZK).

**The allocative component** featured a low correlation coefficient;  $r = 0.318$  and a low share of  $\sigma^2(\alpha)$  on  $\sigma^2(x_i - x)$ , equal to 3.4%. The low share revealed a high variability of the selected states and low dependence. That is why the allocative component is not important on this account (Table 13).

Comparing the Czech Republic and Germany revealed a difference of 12.13 EUR per 1 ha. Subsidies lower by 59.3 EUR in comparison with other states and by 134 EUR compared to Germany was the most important part of this difference. This difference is displayed as a graph in figure 8 and the difference in the change of the structure of production is presented in Figure 9. The mutual influence of the structure of production and the subsidy level is displayed in Figure 10.

The comparison of the share of each component in the total difference of subsidies in the individual

Table 12. Industrial mix component (EUR/ha)

Country	Field crops (1)	Milk (5)	Other razing livestock (6)	Granivores (7)	Mixed (8)	Industry mix component
Czech Republic	25.96	-37.96	-41.67	-5.69	55.60	-3.76
Germany	3.09	35.69	-44.16	0.03	13.08	7.73
France	8.63	3.81	6.45	-3.88	-14.97	0.04
Poland	-13.09	-33.16	-34.63	15.30	62.21	-3.38
Great Britain	-13.22	-7.48	72.75	-4.73	-51.74	-4.41

Source: FADN, own calculation

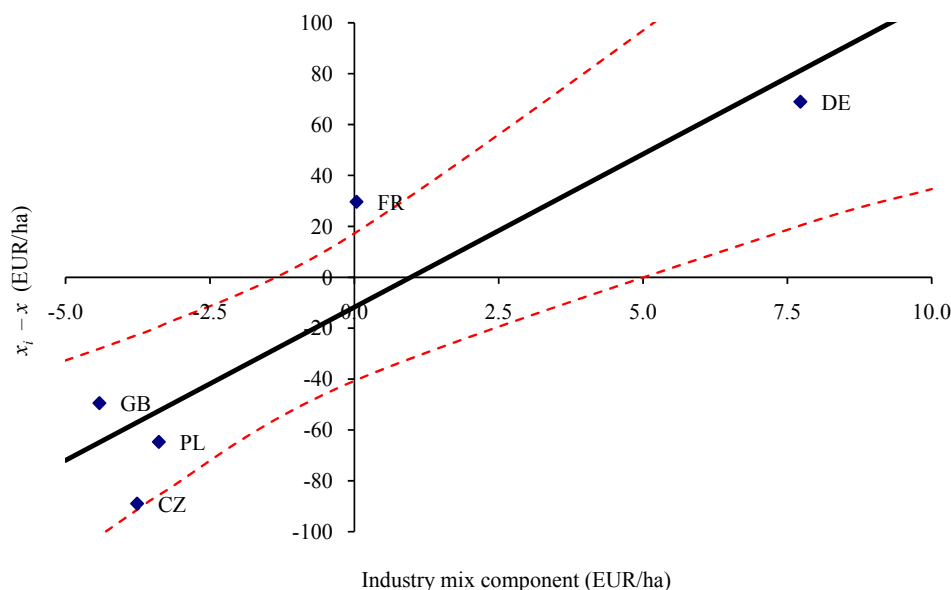


Figure 9. Industry mix component

Source: FADN, own calculation

Table 13. Allocative component (EUR/ha)

Country	Fieldcrops (1)	Milk (5)	Other grazing livestock (6)	Granivores (7)	Mixed (8)	Allocative component
Czech Republic	-8.51	7.72	-7.65	-3.10	-14.41	-25.95
Germany	0.19	8.82	-24.79	0.00	1.95	-13.82
France	0.92	-0.43	1.23	-0.93	-1.52	-0.74
Poland	2.84	8.18	2.55	-1.21	-10.89	1.46
Great Britain	0.18	0.78	-20.28	0.73	-3.32	-21.92

Source: FADN, own calculation

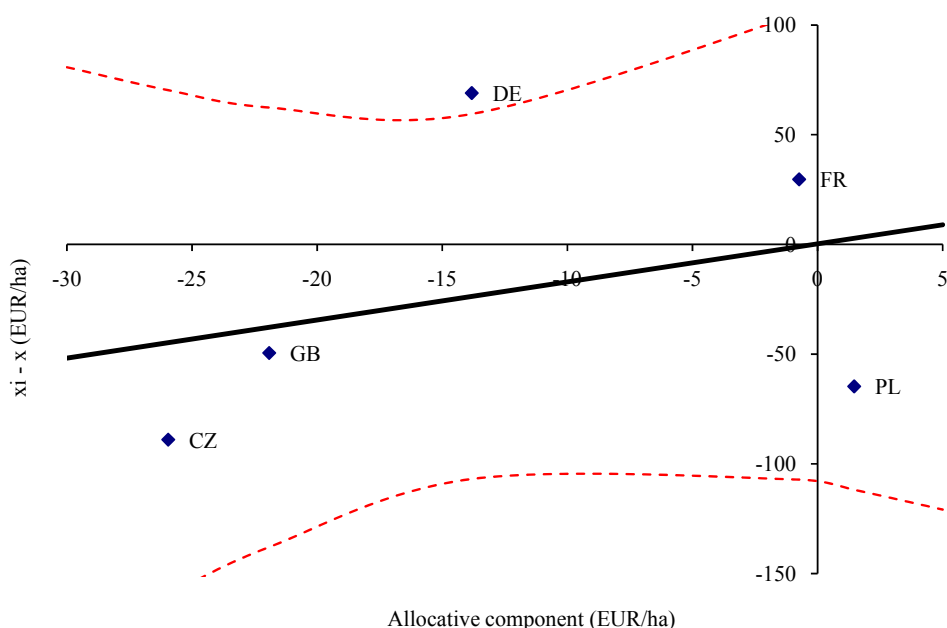


Figure 10. Allocative component

Source: FADN, own calculation

states to the average subsidy in the group of states in our sample revealed the most important influence of the level of subsidies in each state. Lower agricultural subsidies in the Czech Republic in comparison with the other states were under the 66.6% influence of the productivity differential component. The share of the industrial mix components amounted to 4.2% and the allocative component had 29.2%. The negative values of the productivity differential component occurred in the Czech Republic, Poland and Great Britain. Its value amounted to 97% in Poland and 46.8% in Great Britain. On the other hand, its value was equal to 108.8% in Germany and to 102.3% in France.

The sum of the above mentioned three components brought a difference in subsidies in the selected products in the Czech Republic of -89 EUR (approximately 2 314 CZK) compared to the average of the developed states (Table 13).

## CONCLUSION

1. The agriculture in the Czech Republic is competitive. Compared to the selected European states, it has a lower share of subsidies with lower costs.
2. The low share of subsidies weakens the competitiveness, mainly due to the slower renewal and modernization of assets in agriculture.
3. A high substitution of labour and capital is noticeable in the Western Europe; it allows for a significant increase of remuneration while keeping the same wage costs. Knowing that the remuneration in agriculture amounted to 78% of the remuneration in the national economy, we have to notice that the slow substitution and low productivity should drag out the situation.
4. The difference in subsidies is significant for the Czech Republic. Compared to the average of the selected states, it amounted to -89 EUR (i.e.

2 314 CZK). This amount may be compared to the increase of the SAPS by 75%.

5. Different subsidies according to the type of production and the increased subsidy volume may influence the type of production. It may therefore lead to a paradox of stimulation of sectors that are currently suppressed under the influence of the subsidy structure according to the type of production.

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