Effects of the Common Agricultural Policy potential scenarios after 2013 in the Slovak Republic

Efekty potenciálnych scenárov Spoločnej poľnohospodárskej politiky po roku 2013 v Slovenskej republike

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Abstract: The contribution presents the modelling solution of the potential scenarios impact of the Common Agricultural Policy of the European Union after 2013 in the selected sectors of the Slovak Republic national economy. The solution is accomplished using the Computable General Equilibrium model with the emphasis on the productive and less favourable agricultural areas and the theoretical rents for agricultural land. If we take into consideration both pillars of the Common Agricultural Policy of the European Union, according to the modelling calculations in Slovak conditions the most favoured is the Conservative scenario, the Reference and the Flat Rate scenario are neutral and the least favourable is the Liberalisation scenario.

Key words: Common Agricultural Policy of the European Union reform, impact of the Common Agricultural Policy on Slovak agriculture, production and less favoured areas

Abstrakt: Príspevok prezentuje modelové riešenie dopadov potenciálnych scenárov Spoločnej poľnohospodárskej politiky Európskej únie po roku 2013 vo vybraných sektoroch národného hospodárstva Slovenskej republiky. Riešenie je prevedené využitím modelu vypočítateľnej všeobecnej rovnováhy s dôrazom na produkčné a znevýhodnené oblasti poľnohospodárstva a teoretické odmeny za poľnohospodársku pôdu. Ak berieme do úvahy oba piliere Spoločnej poľnohospodárskej politiky Európskej únie, podľa modelových prepočtov v podmienkach Slovenska je najpriaznivejší konzervatívny scenár, referenčný scenár a scenár Flat rate sú neutrálne, liberalizačný scenár je najmenej priaznivý.

Kľúčové slová: reforma Spoločnej poľnohospodárskej politiky Európskej únie, dosahy Spoločnej poľnohospodárskej politiky na slovenské poľnohospodárstvo, produkčné a znevýhodnené oblasti

At present, the profiling of the opinions on the targets and tools of the Common Agricultural Policy of the European Union (EU CAP) reform after 2013 is a highly actual topic for farmers, governments, farm associations, agricultural economists, public and others. For instance Štolbová et al. (2010) propose and verify a way of modelling calculations accomplishment of the predicted impact changes of the EU CAP after 2013 on the compensation level in less favoured areas.

The status of Slovak agriculture within the EU is significantly influenced by the current form and level of its support as Božík et al. (2010) indicate. Therefore, for its decision of the alternative support options of the EU CAP reform after 2013, the agriculture has to define not only the priorities and strategic targets of the direct support, but also the more important forms of support in the 2nd pillar.

By exploring of the economic development in Slovak agriculture, Chrastinová and Burianová (2009) state a paradox that notwithstanding the growing support, the production is decreasing, the level of salaries stagnates and the employment is decreasing. Market economy is significantly affected by input prices, selling prices but also the direct support level.

Research topic of economic research in the Research Institute of Agricultural and Food Economics (RIAFE) is also the evaluation of the potential scenarios impact of the EU CAP after 2013 on Slovak agriculture. The contribution presents the modelling solution of the potential scenarios impact of the EU CAP after 2013 in the selected sectors of the Slovak Republic

national economy through the Computable General Equilibrium model (CGE model) which description indicate its authors Páleník and Kotov (2003). Agricultural policy scenarios, which the European Commision accepts in the EU CAP reform preparation, are in the study of Nowicki et al. (2009). Křístková (2009) documents the use of the CGE models in the EU agricultural policy simulations. In the EU context, the CGE models are mainly applied in the prediction of impacts in the case of the subsidies abolition, the introduction of direct payments decoupled from production, the intervention prices abolition etc. Another significant application of the CGE models in the European area is the impact quantification of the agricultural trade policy liberalisation within the World Trade Organisation. For instance Bednaříková and Doucha (2009) use the CGE model for the impact evaluation of the agricultural policy options and other economic conditions of the rural context development.

MATERIAL AND METHODS

The methodological framework consisted of two components:

(1) Definition of the EU CAP reform scenarios;
(2) Modelling and simulating of the solutions of the alternative scenarios at the inter-sector relations level and at the agricultural sector in the national economy of the Slovak Republic.

The EU CAP reform scenarios after 2013 were quantified by Božík (RIAFE) based on the study of Nowicki et al. (2009) and more details are stated in Božík et al. (2010).

In the term of the total subsidies volume and their allocation into the particular CAP pillars after 2013 and in the terms of the CAP scenarios, there are estimated the following changes:

– Basic (Reference) scenario – the increase of the total payments volume in the 1st and 2nd pillar together by 2.2%, thereof in the 1st pillar the reduction by 31.3% and in the 2nd pillar the increase by 39.1%;
– Conservative scenario – the increase of the total payments volume in the 1st and 2nd pillar together by 5.2%, thereof in 1st pillar the reduction by 13.2% and in 2nd pillar the increase by 25.4%;
– Flat Rate scenario – the increase of the total payments volume in the 1st and 2nd pillar together by 2.1%, thereof in the 1st pillar the reduction by 27.5% and in the 2nd pillar the increase by 34.8%;
– Liberalisation scenario – the decrease of the total payments volume in the 1st and 2nd pillar together by 30.7%, thereof in 1st pillar the reduction by 100% and in the 2nd pillar the increase by 45.7%.

The highest envelope of both CAP pillars would be achieved in the Conservative scenario despite of the lower 2nd CAP pillar volume (the lowest payments volume relocated from the 1st pillar), the aggregate for both pillars 811.2 million EUR in 2014.

Prediction of the EU CAP reform effects was accomplished in the production directed areas level and in the less favourite agricultural areas through the CGE model. The model that is at disposal in the RIAFE estimates the econometric medium-term predictions of agricultural policy impacts.

As the reference data source in the CGE model, we used the Social Accounting Matrix per year 2003. By the type, the agriculture is represented through the productive and less favoured areas. Households are divided into farms and non-farms. Agricultural land value (in terms of the productive and hiring rent) is represented through the theoretical rents for agricultural land that are calculated within the gross operating surplus and mixed revenues.

The above mentioned alternative scenarios of the EU CAP were considered by the CGE model. In the model of the reform scenarios, there were simulated the impacts of subsidies: direct payments, less favoured areas and agro-environmental payments. The mentioned subsidies were quantified for the productive and less favoured areas with the distinction of providing from the EU sources and co-financed from the Slovak national budget. The applied CGE model is static that linked the benchmark period 2003 in the Social Accounting Matrix and the prediction for years 2008, 2013 and 2014 till 2020. The link was generated as the modification of the predicted direct payments volume, the less favoured areas subsidies and the agro-environmental payments by the means of the gross domestic product deflator. Historic values of the gross domestic product deflator from the Eurostat and the data of the Macroeconomics Predictions from the Ministry of Finance of the Slovak Republic for the period 2009–2012 (2009) were the basis for calculations. For the years 2013 till 2020, we fixed the change that was predicted for the year 2012.

RESULTS AND DISCUSSION

The scenario versions were simulated for the years 2008, 2013 and for the aggregation of the years 2014 till 2020. There was explored the value difference of economic indicators among the scenario options. For the selected economic indicators, the aim was to determine the most advantageous (disadvanta-

Table 1. Impact of the scenarios on the production volume (difference among the scenarios in percentage points; comparison of year 2013 and the aggregation of years 2014 till 2020)

Sector products	CONS-REF	LIB-REF	FLAT-REF	LIB-CONS	FLAT-CONS	LIB-FLAT
Productive agricultural areas	1.209	–8.587	0.485	–9.796	–0.724	–9.072
Less favoured agricultural areas	1.771	–9.316	0.734	–11.087	–1.038	–10.050
Forestry	–0.613	–1.944	0.011	–1.331	0.623	–1.955
Food industry	0.101	–3.909	0.181	–4.009	0.080	–4.090
Market services	0.040	0.209	0.000	0.169	–0.040	0.209

CONS = Conservative scenario, REF = Reference scenario, LIB = Liberalisation scenario, FLAT = Flat Rate scenario
Source: own calculations based on CGE model results

geous) scenario application, predominantly for the productive and less favourite area of agriculture[1]. In tables, we present the modelling results also for forestry[2], food industry[3] and market services[4]. The results for food industry could be significant owing to the important multiplication effect. Unless it is not mentioned otherwise, the description of the results refers to the productive and less favoured areas of agricultural sector. Subject to the modelling nature, we would like to state that the values in the tables cannot be considered strictly. The convergence trend of the policy impacts processes is important.

We explored the differences in the values of economic indicators among the scenario versions of subsidy policies between the years:

(1) year 2008 compared to the aggregation years 2014 and 2020,
(2) year 2013 compared to the aggregation years 2014 and 2020.

There were not proved significant differences among the impacts of the particular scenario versions application between the time horizons 1 and 2. This effect was explored because of the direct payment volumes equalization with the old Member States level in 2013. There were significant differences among the impacts of the alternative CAP scenarios application within the time horizons 1 and 2, which point at the new policies important effects. It reflects the impacts of the changed philosophy of the new EU CAP.

In following text, we describe the modelling results of the subsidy policy scenarios effect in the year 2013 compared to the aggregation years 2014 and 2020 primarily for the productive and less favoured areas of the agricultural sector.

The effect of the agricultural policy scenarios on the potential production volume (Table 1) is the most important among results of the modelling calculations.

In the case of the Liberalisation scenario application, the modelling results show the most unfavourable impact from the production support point of view. Somewhere at same level are the effects of the Reference and the Flat Rate scenario. In the case of the Conservative scenario application, it shows the most favourable effect from the production support point of view. The trend is uniform in the productive and also in the less favourite agricultural areas, but the less favourite areas demonstrate a higher sensitivity to the scenarios which are naturally more sensitive to the "economic survival", as the extensive production prevails there.

[1]It concerns the disaggregation of economic activity "Agriculture, hunting and related service activities" on productive and less favoured areas.

[2]It concerns the aggregation of economic activities "Forestry, logging and related service activities" and "Fishing, fish farming and related service activities".

[3]It concerns the aggregation of economic activities "Manufacture of food products and beverages" and "Manufacture of tobacco products".

[4]It concerns the aggregation of economic activities "Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel", "Wholesale trade and commission trade, except of motor vehicles and motorcycles", "Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods", "Hotels and restaurants", "Post and telecommunications", "Financial intermediation, except insurance and pension funding", "Insurance and pension funding, except compulsory social security", "Activities auxiliary to financial intermediation", "Real estate activities", "Renting of machinery and equipment without operator and of personal and household goods", "Computer and related activities", "Research and development" and "Other business activities".

Table 2. Impact of the scenarios on the Armington supply (difference among the scenarios in percentage points; comparison of the year 2013 and the aggregation of years 2014 till 2020)

Sector products	CONS-REF	LIB-REF	FLAT-REF	LIB-CONS	FLAT-CONS	LIB-FLAT
Productive agricultural areas	0.864	–6.945	0.365	–7.808	–0.499	–7.310
Less favoured agricultural areas	1.431	–7.977	0.615	–9.408	–0.816	–8.592
Forestry	–0.650	–1.604	–0.021	–0.954	0.629	–1.583
Food industry	–0.151	–2.217	0.071	–2.066	0.222	–2.287
Market services	0.139	0.427	0.000	0.288	–0.139	0.427

Source and note see Table 1

The differences among the application effects of the Reference, Conservative and Flat Rate scenario in the productive and less favoured areas reach in the absolute expression up to 1.8 percentage points. Food industry and forestry respond to the scenarios similarly with the productive and less favoured areas, however, less sensitively. According to the aggregated sector of market services, we do not observe any significant differences in the impacts of the alternative subsidy policy scenarios application.

As it is evident from Table 2, the impact of the agricultural policy scenarios on the Armington supply[5] is similar to the impact on production, while the indicator responds less sensitively to the scenario change. The order of the scenario impact in productive and less favoured agricultural areas is the following: the most unfavourable impact was observed in the Liberalisation scenario, more favourable was the Reference scenario and the most favourable impacts were registered in the Conservative and Flat Rate scenarios. Differences among the effects of the Reference, Conservative and Flat Rate scenarios in the productive and less favoured areas reach in the absolute expression up to 1.4 percentage points. Compared with other scenarios, we observe a more unfavourable impact of the Liberalisation scenario in the food and forestry sector. This outcome is more prominent in the food sector.

By researching the impact of the agricultural policy scenarios on export volume (Table 3), we register modelling results that are similar by their trends to the impact of the agricultural policy scenarios on the potential production volume. It has to be realized yet that the model in the export volume responds to the prognosis of production (domestic production division of each goods between the domestic market and export). The model assumes the export within the European Union with the free unified market. In the case of the Liberalisation scenario, it assumes more open trade conditions with third countries (countries beyond the European Union) that could positively influence the export volume and which the model did not detect. It will also depend on the fact if this export to the third countries is performed directly or through other EU country.

Compared to the other scenarios, we noticed a slight drop of import (Table 4) in the productive and less favourite areas in the case of the Liberalisation

Table 3. Impact of the scenarios on the export volume (difference among the scenarios in percentage points; the comparison of the year 2013 and the aggregation of years 2014 till 2020)

Sector products	CONS-REF	LIB-REF	FLAT-REF	LIB-CONS	FLAT-CONS	LIB-FLAT
Productive agricultural areas	3.257	–18.338	1.147	–21.594	–2.110	–19.485
Less favoured agricultural areas	4.679	–20.302	1.803	–24.981	–2.876	–22.105
Forestry	–0.503	–3.610	0.098	–3.106	0.602	–3.708
Food industry	0.570	–7.234	0.390	–7.804	–0.180	–7.624
Market services	0.840	1.400	0.068	0.560	–0.773	1.333

Source and note see Table 1

[5]Armington supply – aggregate supply in domestic market that satisfies domestic demand – intermediate consumption, final household consumption, final state consumption and investments.

Table 4. Impact of the scenarios on the import volume (difference among the scenarios in percentage points; the comparison of the year 2013 and the aggregation of years 2014 till 2020)

Sector products	CONS-REF	LIB-REF	FLAT-REF	LIB-CONS	FLAT-CONS	LIB-FLAT
Productive agricultural areas	–0.131	–1.467	0.051	–1.335	0.182	–1.517
Less favoured agricultural areas	–0.100	–1.210	0.040	–1.110	0.140	–1.250
Forestry	–0.720	–0.668	–0.082	0.051	0.638	–0.586
Food industry	–0.364	–0.646	–0.020	–0.283	0.343	–0.626
Market services	–0.221	–0.121	–0.020	0.101	0.201	–0.101

Source and note see Table 1

scenario application. The differences among the Reference, Conservative and Flat Rate scenarios are negligible. By the alternative scenario application in other monitored sectors, the differences in the potential import are negligible.

According to the potential application of the Liberalisation scenario, the model expressed a strong unfavourable effect on the gross value added[6] of the monitored sectors (except the aggregate sectors forestry and market services; Table 5). The trend is again uniform like with the other researched indicators in the productive and less favoured areas. Calculations from the modeling results indicate a greater sensitivity to the scenarios in case of the less favoured areas. At a similar level, the Reference and Flat Rate scenarios were conclusive from the gross value added point of view. In the term of the gross value added creation, the most favourable impact was proved by the potential application of the Conservative scenario. Food industry responds to the Liberalisation scenario in a comparable way in the productive and less favoured areas, but less sensitively – the differences in other scenario alternatives oscillate around zero. In the aggregate sector of market services, we do not notice any significant differences in the impacts of the alternative scenarios application of support policies on the gross value added creation.

The selection of scenario did not affect the share of the monitored sectors in the total gross value added (Table 6) – the results oscillate around zero.

Table 5. Scenarios influence on the gross value added (difference among the scenarios in percentage points; the comparison of the year 2013 and the aggregation of years 2014 till 2020)

Sector products	CONS-REF	LIB-REF	FLAT-REF	LIB-CONS	FLAT-CONS	LIB-FLAT
Productive agricultural areas	1.876	–10.696	0.741	–12.572	–1.135	–11.438
Less favoured agricultural areas	5.292	–20.813	2.034	–26.106	–3.258	–22.848
Forestry	–0.679	–1.848	–0.025	–1.169	0.654	–1.823
Food industry	–0.299	–3.175	0.090	–2.876	0.389	–3.265
Market services	0.116	0.382	0.001	0.266	–0.115	0.381

Source and note see Table 1

[6]Gross value added within the Social Accounting Matrix constructed in the Research Institute of Agricultural and Food Economics for the particular sectors is structured as the remuneration of employees (divided into wages and salaries and social benefits of employers), other duties of production, other production subsidies, gross operational surplus and gross mixed revenues – this account we implemented as the theoretical rents for capital and the theoretical rents for land. We introduced additional modifications in the Social Accounting Matrix for agricultural sector on the accounts of production subsidies and products subsidies – we implemented for agricultural sector an account "Production subsidies" as land subsidies. This fact could influence the results of calculations for gross added value as the values of this indicator are not directly the results of the simulations but they are additionally calculated.

[7]Theoretical rents for agricultural land were calculated on the basis of the productive and hiring rents while the productive rent takes into consideration the aspect determined by the society in order to compensate the unequal natural conditions and, moreover, it the expresses the production potential of agricultural land through the gross annual rent effect.

Table 6. Scenarios influence on the sectors' share in total gross value added (difference among scenarios in percentage points; the comparison of the year 2013 and the aggregation of years 2014 till 2020)

Sector products	CONS-REF	LIB-REF	FLAT-REF	LIB-CONS	FLAT-CONS	LIB-FLAT
Productive agricultural areas	0.040	–0.235	0.016	–0.275	–0.024	–0.251
Less favoured agricultural areas	0.081	–0.320	0.031	–0.401	–0.050	–0.352
Forestry	–0.006	–0.012	0.000	–0.006	0.005	–0.012
Food industry	–0.010	–0.079	0.002	–0.069	0.012	–0.081
Market services	0.014	0.215	–0.009	0.201	–0.022	0.224

Source and note see Table 1

The scenario influence on the theoretical rents for agricultural land[7] and the agricultural land price in the productive areas (Table 7) we recorded by the model as follows: by the influence of the Liberalisation scenario, there occurs an evident increase of the theoretical rents for agricultural land in less favoured areas and a notable decrease of the theoretical rents for agricultural land in productive areas. By the influence of the Flat Rate and Reference scenarios, there can be expected an increase of the theoretical rents for agricultural land in less favoured areas and a decrease of the theoretical rents for agricultural land in productive areas. There are larger fluctuations by the Reference scenario application. Under the influence of the Conservative scenario, there are not recorded any significant changes in the theoretical rents for agricultural land. The differences in the alternative scenario effects on the theoretical rents for agricultural land in food industry and forestry have not any significant impact with respect to the low calculation of theoretical rents for agricultural land in the original data source (a drop under the influence of the Liberalisation scenario in both sectors and a growth within other scenarios in forestry). An important growth of the theoretical rents for agricultural land in less favoured areas and a significant decrease of the theoretical rents for agricultural land in productive areas through the Liberalisation scenario application indicate that the Liberalisation scenario is more suitable from the 2nd pillar point of view compared with other scenarios, as the less favoured areas will apparently be targeted as the absorbents of subsidies in order to preserve the landscape pattern of rural countryside and other socially positive aspects. Under the influence of the Liberalisation scenario, there occurs a significant growth of the agricultural land price in productive areas. Agricultural land price in the productive areas is decreasing more under the influence of the Conservative scenario than the Flat Rate scenario, and by the Reference scenario influence it remains practically unchanged. We can also express this outcome through the conclusion of Nowicki et al. (2009) study, that "direct payments abolition will have particularly impact on low profitable land valuation abandonment". We imagine that in this case, the price in productive areas will rise particularly with regard to the highest quality agricultural land where

Table 7. Scenarios influence on the theoretical rents for agricultural land and the agricultural land price in productive areas (difference among the scenarios in percentage points; comparison of the year 2013 and the aggregation of years 2014 till 2020)

Sector products	CONS-REF	LIB-REF	FLAT-REF	LIB-CONS	FLAT-CONS	LIB-FLAT
Productive agricultural areas	1.137	–9.444	0.520	–10.581	–0.617	–9.964
Less favoured agricultural areas	–1.321	11.810	–0.624	13.131	0.697	12.434
Forestry	0.344	–12.027	0.687	–12.371	0.344	–12.715
Food industry	0.000	–14.286	0.000	–14.286	0.000	–14.286
Market services	0.000	0.000	0.000	0.000	0.000	0.000
Agricultural land price – productive areas	–4.843	13.947	–1.415	18.790	3.428	15.362

Source and note see Table 1

it is possible to ensure the competitive production regardless of subsidies.

CONCLUSION

The negative effect of the Liberalisation scenario was clearly proved in the indicators related to production namely in agriculture and also in food industry. This negative effect was reflected more in less favoured areas compared to productive areas. Less favoured areas are more sensitive to the "economic survival", as the extensive production prevails in them. The Computable General Equilibrium model clustered the Reference, Conservative and Flat Rate scenarios very closely with regard to the impacts on the stated indicators in the mentioned sectors. Influences of these budget transfer modifications are negligible in the mutual comparison.

Modelling results of the agricultural policies impact on the gross value added are similar in basic interpretation as the above mentioned findings (the negative effect of the Liberalisation scenario application). The selection of scenario did not influence the share of the researched sectors in the total gross value added.

A significant growth of the theoretical rents for agricultural land in less favoured areas as well as an important slump of the theoretical rents for agricultural land in productive areas by the Liberalisation scenario application indicates that the Liberalisation scenario is more suitable compared to other scenarios.

Under the influence of the Liberalisation scenario, there occurs a significant growth of the agricultural land price in productive areas. The direct payments abolition would have particularly an impact on the low profitable land valuation abandonment. We imagine that in this case, the price in productive areas will rise primarily regarding the highest quality agricultural land, where it is possible to ensure the competitive production regardless of subsidies.

By the simplified implication: if the direct payments support the intensive farming and the payments for less favoured areas and the agro-environmental payments support the aspects of the rural countryside preservation and other socially positive aspects, then the Reference, Conservative and Flat Rate scenarios are more suitable from the direct payments point of view. Compared to other scenarios, the Liberalisation scenario is more suitable from 2nd pillar point of view. The direct payments abolition or their radical change will lead very probably to the restriction of intensive production and towards the change of the trade situation. The above mentioned refers to the productive and also to the less favoured areas of agriculture, whereas direct payments are the expressive stabilizer of revenues.

If we take into consideration both pillars, the Conservative scenario is the most favourable, the Reference and Flat Rate scenarios are neutral and the Liberalisation scenario is the least favourable.

The Computable General Equilibrium model is a considerable simplification of the reality and therefore the results can just point to the possible convergence of the processes.

For Slovakia it cannot be priority the form of scenario but the equality of conditions with possibility of differential application within Slovakia regions. Fundamental and principal demand of Slovakia in new EU CAP after 2013 is more fair payments allocation from EU funds and insists on fair allocation for farmers in old and also in new Member States (Božík et al. 2010).

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Arrived on 27th October 2010

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