The impact of the CAP reform and exchange rates on Slovak agriculture

Dopad reformy SPP a zmien výmenných kurzov na slovenské poľnohospodárstvo

P. Ciaian[1, 3], J. Pokrivčák[1, 3], Ľ. Bartová[1, 2], D. Drabik[1]

[1]*Slovak Agricultural University in Nitra*
[2]*The Institute for Prospective Technological Studies (IPTS), Sevilla, Spain*
[3]*Katholieke Universiteit, Leuven, Belgium*

Abstract: This paper uses a dynamic, partial equilibrium econometric model to analyze the impact of the 2003 CAP reform and changes of exchange rate on agricultural markets and agricultural incomes in Slovakia. We evaluate three scenarios: 1) baseline scenario with no change in agricultural policies (Single Area Payment Scheme and top-ups are assumed until 2015), 2) CAP reform scenario with full decoupling from 2007 and with modulation from 2013, and 3) exchange rate scenario. In the baseline scenario, production increases. Consumption increases with some exceptions (like pork). Agricultural income rises significantly in the baseline scenario. The full decoupling has a minor impact on agricultural markets relative to the baseline. Weak Euro would lead to higher prices and higher production but lower consumption. Change in the exchange rate causes substitution in consumption of certain commodities due to the relative price changes.

Key words: agricultural policy, agricultural markets, CAP reform, decoupling

Abstrakt: Článok sa zaoberá dopadom vstupu Slovenska do Európskej únie na slovenský poľnohospodársky sektor. Projekcie do roku 2015 sa uskutočnili pomocou dynamického ekonometrického modelu parciálnej rovnováhy. Hodnotili sa tri scenáre. Východiskový scenár predpokladá nezmenenú poľnohospodársku politiku; jednotnú platbu na plochu a národné doplatky. Scenár reformy SPP predpokladá, prijatie reformovanej SPP od roku 2007 (úplné odčlenenie platieb od produkcie) a moduláciu od roku 2013. Tretí scenár simuluje zmeny vo výmennom kurze Euro/USD. Výsledky východiskového scenára ukazujú, že produkcia sa bude zvyšovať. To isté platí pre spotrebu, s niektorými výnimkami (napr. bravčové mäso). Úplné odčlenenie platieb od produkcie nebude mať významný vplyv na poľnohospodárske trhy. Slabé Euro povedie k zvýšeniu cien a nárastu produkcii, zatiaľ čo spotreba by sa mala znížiť. Zmena výmenného kurzu vedie k substitúcii v spotrebe niektorých komodít kvôli zmene relatívnych cien.

Kľúčové slová: poľnohospodárska politika, poľnohospodárske trhy, reforma SPP, decoupling

The European Union (EU) accession significantly affects agricultural sectors in the new member states, including Slovakia. Support of farmers has increased in Slovakia after adoption of the Common Agricultural Policy (CAP). Agricultural prices generally increased to converge to higher prices in the EU market.

In the first years after accession Slovakia, implements the Single Area Payment Scheme (SAPS), which is a simplified version of the CAP applied in old EU member states.

In parallel with the enlargement negotiations, the EU reformed its CAP in 2003. The CAP reform introduced in old member states the Single Farm Payment (SFP) under which subsidies to farms are decoupled. New member states are required to switch to the SFP in 2009 at the latest.

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While there are many studies analyzing the impacts of the EU accession on agriculture (Anderson, Tyers 1993; Tangermann, Josling 1994; Hertel et al. 1997; Banse 2000; Banse et al. 2000; Hartell, Swinnen 2000; Münch 2000; Bielik, Pokrivčák 2001; Blaas, Božík 2002; European Commission 2002; Božík, Izakovič 2004; Blaas, Božík 2004; Pokrivčák, Ciaian 2004; Chrastinová 2005), very few papers analyze the impact of the 2003 CAP reform on the new member states' agriculture. The main findings of these studies are that decoupling induced by the CAP reform strengthens the efficiency of agricultural production by allowing farmers to move out of less competitive commodities without losing direct payments. Other important finding is that decoupled payments, granted as entitlement per farm, may favor incumbent farms and therefore constrain restructuring. (Ciaian, Swinnen 2006; European Commission 2003).

The objective of the paper is to analyze the impact of the CAP reform and exchange rate on agricultural sector in Slovakia. We use a modeling approach of the AG-MEMOD Partnership[1]. The model is based on the EU Gold model (Hanrahan 2001), developed by the FAPRI and extended by the AG-MEMOD partnership.

The paper is organized as follows. The next section provides a brief description of the model. Assumptions of policy scenarios and results are presented in the third and fourth section. The last section concludes.

THE MODEL

We use a dynamic, partial equilibrium econometric model. It includes major agricultural commodities inter-linked through cross price elasticities, and cross elasticities of demand for land. There are also links between the crop and livestock sectors. Each sector is represented by supply and demand relationships. These relationships are estimated or calibrated. For calibration, elasticities and coefficients from economic literature are used. All relevant CAP policies are incorporated in the model.

Domestic prices are endogenous and are represented by the relationships that link them to the EU market prices. The EU prices are exogenous. The exception is the oilseeds model, where domestic market prices are directly linked to world prices. For a more detailed description of the general model see Hanrahan (2001) and Westhoff (2000) and for the description of the Slovak model see Pokrivčák, Bartová, and Ciaian (2005).

Data used for modeling come from various sources: the VÚEPP (Research Institute of Agricultural and Food Economics), the Eurostat, the OECD, the FAO, the Ministry of Agriculture of the Slovak Republic, the Slovak Statistical Office, the National Bank of Slovakia, the Customs Statistics, the Slovak Academy of Sciences, the FAPRI University of Missouri, the European Commission.

POLICY SCENARIOS

The following three scenarios are assumed:

1) Baseline scenario: this scenario assumes no change in policy. Adoption of the SAPS and national top-ups are assumed until 2015.
2) CAP reform (FCR) scenario: this scenario assumes adoption of the SFP in Slovakia in 2007 and it also assumes modulation from 2013.
3) Exchange rate change (ERC) scenario: in this scenario, three euro/USD exchange rate sub-scenarios

Table 1. Macro variables

	Unit	2000	2005	2006	2007	2008	2009	2010	2011	2012	2015
Population	million	5.40	5.42	5.42	5.43	5.43	5.43	5.43	5.43	5.43	5.44
GDP	mil euro 95	16 211	22 907	24 732	29 719	33 236	32 983	33 391	34 849	36 795	4 3009
GDP per capita	euro 95/cap.	3 003	4 227	4 561	5 478	6 124	6 075	6 150	418	6 778	7 908
Inflation	1990=1	1.353	1.651	1.707	1.747	1.784	1.826	1.870	1.913	1.957	2.080

Sources: Slovak Statistical Office, National Bank of Slovakia, UN, IMF, FAPRI

[1] AG-MEMOD is a pan-EU research partnership to analyse prospects for the agri-food sector in Member States and the EU as a whole. The AG-MEMOD Partnership was founded in 2000. Research partners are drawn from the 24 EU Member and Acceding States. The AGMEMOD is funded under the European Commission 6th Framework and by contributions from the partners institutes throughout the EU. The current work programme of the Partnership focuses on the EU 6th Framework and an associated project for the Institute for Prospective and Technological Studies (IPTS), part of the European Commission's Joint Research Centre. The 6th Framework project is set to run until 2008 and the IPTS project will be completed by 2007. (For more details see http://www.tnet.teagasc.ie/agmemod/).

are considered: ERC-1 (euro = 1 USD), ERC-2 (euro = 1.3 USD) and ERC-3 (euro = 1.4 USD).

MACRO ASSUMPTIONS

Assumptions on macro variables are provided in Table 1. It is assumed that GDP will grow on average 4.6% annually. Inflation rate is assumed to decline and Slovak currency to appreciate (Table 1).

RESULTS AND DISCUSSION

Baseline scenario

Domestic prices are linked to the EU prices in the Slovak model. The EU prices are exogenous in the Slovak model and come from the AG-MEMOD EU model. The EU cereal and most of animal product prices are assumed to decline during the projection period relative to 2000, with the highest decrease occurring to broiler and diary products. The EU oilseeds and potato prices are assumed to increase (Table 2.).

From the start of the accession, direct payments were partially introduced in Slovakia at 52.5% of the EU level in 2004 (25% were financed from the EU budget and the rest of 27.5% from national budget and rural development budget). In 2005, the EU budget financed 30% of the EU level, while top-ups were 22.7%. For the period starting from 2006, top-ups are assumed to stay at 30%. Payments from the EU budget increase every year reaching 100% in 2013. Subsidies in Slovakia reach 100% of the EU level in 2010 (Table 3).

Slovakia implements a relatively highly decoupled agricultural policy. Direct payments financed from the EU budget are disbursed under the Simplified Area Payment Scheme. Under this scheme, payments

Table 2. Selected key prices (index 2000=100)

Index	2000	2005	2010	2015	Index	2000	2005	2010	2015
French wheat	100	95	97	99	Pigmeat	100	87	90	92
French barley	100	89	96	101	Lambmeat	100	105	104	102
French maize	100	86	90	91	Broiler	100	94	87	80
Dutch potato	100	270	204	221	Butter	100	89	79	81
Soybean, Rott.	100	92	102	108	SMP	100	81	74	75
Rapeseed, Ham.	100	104	114	117	WMP	100	91	88	88
Sunseed, Rott.	100	95	112	114	Cheese	100	100	101	102
German beef	100	94	95	98					

Source: Own calculations

Table 3. Direct payments in Slovakia

	Direct payments from EU budget	Top-ups (national government + RD)	Total direct payments	Direct payments from EU budget	Top-ups (national government + RD)	Total direct payments
	%			mill. SKK		
2004	25.0	27.5	52.5	3 061	3 913	6 975
2005	30.0	22.7	52.7	4 046	3 123	7 169
2006	35.0	30.0	65.0	4 959	4 330	9 289
2007	40.0	30.0	70.0	6 084	4 640	10 724
2008	50.0	30.0	80.0	7 415	4 524	11 939
2009	60.0	30.0	90.0	8 695	4 421	13 116
2010	70.0	30.0	100.0	10 152	4 424	14 576
2011	80.0	20.0	100.0	11 615	2 953	14 568
2012	90.0	10.0	100.0	13 078	1 478	14 556
2013	100.0	0.0	100.0	14 549	0	14 549

Source: European Commission, Slovak Ministry of Agriculture, VÚEPP

Table 4. Baseline results

	Unit	2000	2005	2006	2007	2008	2009	2010	2012	2015
Total grains										
production	1 000 t	2 081	3 395	3 405	3 403	3 420	3 424	3 431	3 458	3 508
domestic use	1 000 t	2 301	2 428	2 529	2 595	2 657	2 715	2 770	2 879	3 036
of which wheat										
production	1 000 t	1 244	1 801	1 786	1 770	1 762	1 749	1 738	1 730	1 727
domestic use	1 000 t	1 419	1 303	1 338	1 368	1 398	1 426	1 451	1 501	1 576
producer price	€/t	88	104	105	119	125	117	115	117	121
of which soft barley										
production	1 000 t	397	882	863	855	858	870	884	907	941
domestic use	1 000 t	429	613	646	658	664	670	678	694	713
producer price	€/t	91	95	97	109	116	110	107	109	114
Oilseeds										
production	1 000 t	256	432	479	526	539	546	552	559	571
domestic use	1 000 t	175	191	181	180	182	183	184	186	191
of which rapeseed										
production	1 000 t	134	256	282	306	308	309	310	310	311
domestic use	1 000 t	123	120	118	119	120	121	122	124	128
producer price	€/t	166	248	252	287	305	289	280	283	293
Beef and veal										
production	1 000 t	48	51	48	46	45	43	43	42	41
domestic use	1 000 t	49	31	31	32	32	33	33	34	36
producer price	€/100 kg	100	273	278	312	331	315	306	310	323
Pork meat										
production	1 000 t	164	125	125	126	125	125	125	123	121
domestic use	1 000 t	179	153	153	152	152	152	152	152	151
producer price	€/100 kg	97	136	134	147	157	152	150	149	158
Poultry meat										
production	1 000 t	85	100	104	106	109	112	115	120	128
domestic use	1 000 t	92	134	129	133	137	141	145	152	163
producer price	€/100 kg	69	146	146	155	160	155	151	150	151
Milk production	1 000 ton	1 099	1 089	1 121	1 130	1 135	1 147	1 156	1 163	1 160
milk producer price	€/100 kg	20	28	27	23	22	24	25	24	24
Butter										
production	1 000 t	16	18	18	18	18	19	20	20	21
domestic use	1 000 t	14	15	16	16	16	16	16	16	16
wholesale price	€/100 kg	216	322	315	336	351	339	332	336	346
SMP										
production	1 000 t	7.8	9.8	9.2	6.4	5.5	6.8	7.4	6.9	5.8
domestic use	1 000 t	4.2	4.9	5.0	5.0	4.9	4.9	4.9	4.9	4.8
wholesale price	€/100 kg	175	159	149	141	142	142	142	142	142
Cheese										
production	1 000 t	29	44	44	41	40	42	43	42	42
domestic use	1 000 t	24	26	27	28	28	28	28	28	29
wholesale price	€/100 kg	267	284	285	273	270	277	280	278	283

Source: Own calculations

are granted per hectare of utilized agricultural area. Payments financed from the national government and from the rural development program (top-ups) are split in two parts. The major part of top-ups are granted per hectare of arable land (except for potatoes, sugar beet and vegetables). The rest of top-ups are coupled payments and are disbursed per head of suckler cows, ewes and goats.

For the modeling purposes, the decoupled direct payments granted per hectare are distributed to crop and livestock sectors and are calculated per unit of production or per hectare taking into consideration the 2004 year allocation of direct payments and the 2004 year production levels. With perfect markets, these payments do not affect farm incentives (farm behavior). Cross compliance, risk effect, alleviation of credit constraint and policy risk are the main reasons why the decoupled payments may have some impact on farm behavior (Westhoff, Binfield 2003). The decoupled direct payments are assumed to increase farm incentives, but by less than prices. Farms allocate more resources to the sectors that allocate higher payments. The couplement coefficient which measures to what extent they change farm incentives relative to prices is assumed to be equal 0.15.

Part of the top-ups will remain coupled to production (to sheep and suckle cows). As a result, it is assumed that they will have a larger impact on production. The coefficient reflecting their effect on farm incentives is assumed to be equal 0.5.

Before accession, the majority of prices in Slovakia were below the EU prices. After accession, Slovak domestic prices are assumed to converge in one year to the EU prices (to the key prices). Specifically they are assumed to increase in 2004 and the following years by an adjustment factor that is equal to 90% of the difference between the domestic price in 2003 and its respective key price in 2003.

Grains and oilseed sectors

The simulation results for the baseline scenario are shown in Tables 4 and 5. The most of the projections in the tables are compared relative to the level in 2000. However, one must take into consideration the fact that supply and consumption for most agricultural commodities were lower in 2000 than in the years after or before.

In spite of the exogenous decline of key grain prices, domestic nominal cereal prices are expected to slightly increase due to convergence. Real prices of grains decline, however. Technological progress leading to higher yields more than offsets the real price decline and as a result, production of grains increases. Domestic use of grains also increases reflecting the rising incomes.

Oilseed production significantly increases in the first years after the accession relative to year 2000. This is caused by a significant domestic price increase, by the rise of direct payments (impact limited due to the high degree of decoupling), and by the increase in yields. Domestic use of oilseeds is expected to increase because of the assumed growth of income and rise in the feed demand.

Livestock and dairy sectors

Beef and veal production is affected by the milk quota. After the initial adjustment of prices and stocks, production of beef and veal stabilizes. Production reflects the fluctuation of the key prices. Domestic use of beef and veal declines relative to the year 2000 because of real price increase.

Pork production sharply declines in the first years after accession because of the removal of the pre-accession pork subsidies and the decline of the real price of pork. Domestic use of pork is stable but at a lower level than in the base year. Domestic use of pork reflects both decline of real price and the substitution towards poultry meat. The latter effect outweighs the former one.

Nominal producer price of poultry is expected to increase. Relative price of poultry declines with respect to beef and veal price. This is the reason for an increase in the domestic use of poultry. Production of poultry meat increases reflecting productivity growth.

Producer price of butter after accession initially increases and then we expect stabilization. Production

Table 5. Agricultural output, subsidies and income (2000 = 1)

	2005	2006	2007	2008	2009	2010	2012	2015
Agricultural output value	1.71	1.73	1.84	1.91	1.87	1.86	1.88	1.95
Subsidies/SFP	0.96	1.24	1.48	1.69	1.90	2.11	2.11	2.12
Feeding costs	1.05	1.09	1.25	1.34	1.28	1.26	1.31	1.39
Gross agricultural income	1.71	1.78	1.90	1.99	2.00	2.03	2.04	2.10

Source: Own calculations

Table 6. The CAP reform percentage change from baseline (%)

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total grains									
production	–0.24	0.01	–0.01	–0.01	0.08	0.08	–0.04	–0.04	–0.04
domestic use	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
of which wheat									
production	–0.27	–0.01	–0.03	–0.03	0.08	0.07	–0.06	–0.05	–0.06
domestic use	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
producer price	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of which soft barley									
production	–0.27	–0.05	–0.07	–0.07	0.04	0.06	–0.07	–0.07	–0.08
domestic use	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
producer price	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oilseeds									
production	0.09	0.08	0.08	0.08	0.04	0.01	0.04	0.05	0.07
domestic use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of which rapeseed									
production	0.12	0.12	0.12	0.12	0.07	0.02	0.05	0.07	0.09
domestic use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
producer price	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Beef and veal									
production	0.02	0.01	–0.01	–0.02	–0.01	–0.04	–0.03	–0.02	–0.02
domestic use	0.00	–0.01	–0.01	–0.01	–0.01	–0.01	–0.01	–0.01	–0.01
producer price	0.00	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03
Pork meat									
production	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
domestic use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
producer price	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00
Poultry meat									
production	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
domestic use	0.00	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01
producer price	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Milk production	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
milk prod. price	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Butter									
production	0.05	0.07	0.09	0.09	0.08	0.06	0.03	0.01	0.00
domestic use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
wholesale price	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SMP									
production	0.25	0.39	0.39	0.40	0.36	0.30	0.16	0.07	0.00
domestic use	0.00	0.01	0.02	0.03	0.03	0.03	0.02	0.01	0.01
wholesale price	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cheese									
production	0.03	0.05	0.06	0.06	0.05	0.04	0.02	0.01	0.00
domestic use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
wholesale price	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Own calculations

of butter reflects this and stabilizes towards the end of the projecting period. Production of butter is significantly affected and constrained by the milk quota. Domestic use of butter declines relative to the pre-accession level (but increases relative to the level in 2000) due to the rise of price, then we expect stabilization.

Wholesale real price of skim milk powder (SMP) is expected to go down after year 2005. Domestic production of the SMP declines relative to the pre-accession level (but increases relative to the level in 2000) and domestic use of the SMP after an initial rise remains relatively stable afterwards.

Cheese producers' prices go up initially and then decline. Production of cheese initially increases and then declines towards the end of the projecting period. Domestic use is expected to stay stable and close to the pre-accession level over the forecasting period.

Agricultural income

Agricultural income increases significantly after the accession. Initially, the increase in income is mainly driven by price increases, later, however, the income rise is driven by subsidies. The share of subsidies in the total income increases from 9% in 2005 to 16% in 2015.

The CAP Reform (FCR) Scenario

The projections for macroeconomic indicators, world prices, and intervention prices are the same as in the baseline. Assumptions on agricultural policies differ with the baseline in two respects: (1) full decoupling is assumed from 2007 and (2) modulation is assumed from 2013 (6% in 2013, 8% in 2014 and 10% in 2015).

FCR Scenario Main Results

The results for the CAP reform scenario are shown in Tables 6 and 7. The full decoupling will not have a significant impact on supply and consumption of agricultural commodities. The main reason is that the CAP implemented in Slovakia is highly decoupled. Most of the payment are granted per hectare and the payments (with small exceptions) are not conditional to growing specific crops. Introduction of the CAP reform will therefore have limited impact on the agricultural sector (Table 6).

Modulation has some negative impact on production of agricultural commodities but small because the decoupled payments have a limited impact on farm decision. A stronger impact of modulation is expected on gross agricultural income, declining by around 1.6% in 2015 relative to the baseline. Table 7 shows that subsidies increase in the CAP scenario relative to the baseline between 2005 and 2012 because there is an increase of the per hectare payments in favor of area included in the model. In the baseline, arable area received higher per hectare payments than other areas. With the CAP reform scenario per hectare payments are equalized. The area included in the model (e.g. grassland thus benefiting animal sector) benefits more than the area that is outside the model (e.g. other arable area).

Exchange Rate Change (ERC) Scenario

The projections for macroeconomic indicators, world prices, intervention prices and agricultural policies are the same as in the baseline. In this scenario, three exchange rate sub-scenarios are considered: ERC-1 (euro = 1 USD), ERC-2 (euro = 1.3 USD) and ERC-3 (euro = 1.4 USD). These changes in exchange rate are introduced from 2007.

FCR Scenario Main Results

The results for the exchange rate scenario are shown in Tables 8–10 and Figure 1. The tables and figure show percentage changes of the exchange rate scenario results relative to baseline.

Slovak prices in the exchange rate scenarios ERC-2 and ERC-3 decline relative to the baseline as the Euro

Table 7. Agricultural output, subsidies and income – the CAP reform percentage change from baseline (%)

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Agricultural output value	–0.05	0.03	0.02	0.03	0.05	0.04	0.00	0.00	0.00
Subsidies	7.68	6.94	6.36	5.86	4.58	2.92	–4.81	–6.83	–8.86
Gross agricultural income	0.92	0.97	1.00	1.01	0.81	0.52	–0.80	–1.12	–1.44

Source: Own calculations

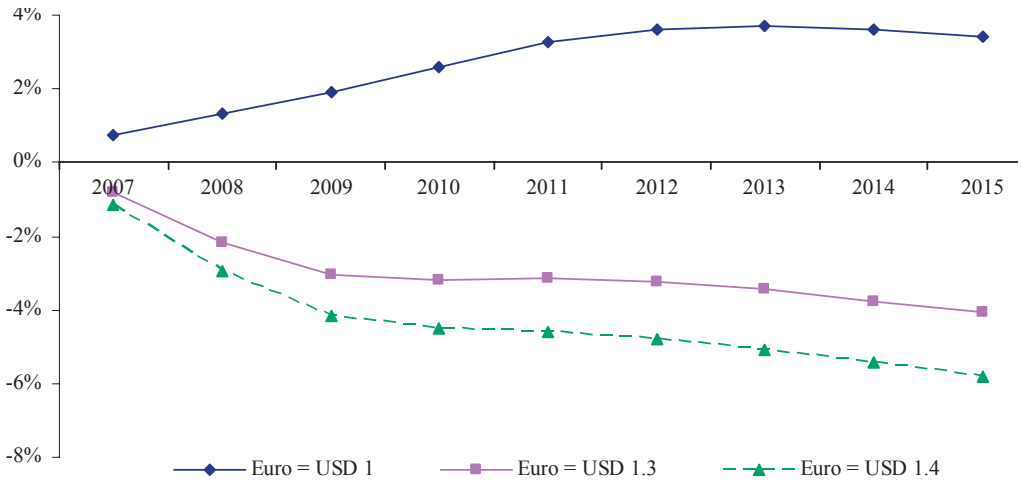

Figure 1. Gross agricultural income – percentage change from the baseline

Source: Own calculations

is assumed to appreciate relative to the US dollar from 2007 (Tables 8–10). The largest decline is in scenario ERC-3, because was assumed the strongest Euro appreciation against US dollar. In scenario ERC-1, where the Euro-US dollar exchange rate equals 1.0, the prices increase relative to the baseline.

In the ERC-1 scenario, the supply of most commodities increases relative to baseline. The exception are grains. Relative prices of grains and oilseeds change in favor of oilseeds. The competition for land resources leads to a reduction of the grains area and hence to reduction in production in favor of oilseeds. There is substitution of meat consumption from pork to poultry and beef as the pork meat price increases more than the prices of poultry and beef. The consumption of crop commodities increases relative to the baseline level. This is driven by an increase in feed consumption which offsets the decline of crop food consumption led by the price rise.

In the ERC-2 and ERC-3 scenarios, the supply of most commodities decreases relative to the baseline because of the prices decline. There is substitution of meat consumption from beef and poultry to pork because the pork meat price decreases more than the prices of poultry and beef. The consumption of crop commodities declines relative to the baseline. The decrease of animal production reduces demand for feed. The decline in consumption of crops is driven by the decrease in feed consumption offsetting the increase of crop food consumption led by the price decline.

The price development is reflected in the agricultural income patterns. For the ERC-1 scenario, gross income increases relative to the baseline. For the ERC-2 and ERC-3 scenarios, gross income declines relative to the baseline (Figure 1).

CONCLUSIONS

A dynamic, partial equilibrium econometric model was used to analyze the impact of the 2003 CAP reform and the possible changes in Euro exchange rate relative to the US dollar on agricultural markets and agricultural incomes in Slovakia. Three scenarios were evaluated: 1) baseline scenario which assumes no change in agricultural policy (Single Area Payment Scheme and top-ups until 2015), 2) CAP reform scenario which assumes full decoupling from 2007 and modulation from 2013, and 3) exchange rate scenario.

Production of most crops increases in the baseline scenario. The expected decline in real prices is more than offset by higher yields caused by technological progress.

In the animal sector, there is a mixed picture observed: pork production carries on its declining trend, there is no change in production of dairy and beef because of the quota constraints, but poultry production increases.

Consumption of crops goes up in the baseline as the income rise offsets the negative effect of price increase. Consumption of pork declines because of the substitution in consumption of pork by poultry, change in consumers' preferences and due to the income rise.

Agricultural income increases significantly after the accession in the baseline scenario. Initially, the income rises because of price increase later the income is driven by rising subsidies.

The CAP reform has only a limited impact on agriculture in Slovakia compared to the baseline scenario. The reason is simple, the CAP was already highly decoupled in the baseline. Modulation has a strong

Table 8. Exchange rate scenario ERC-1 (Euro = USD 1) results – percentage change from the baseline (%)

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total grains									
production	0.0	–0.2	–0.1	–0.2	–0.2	–0.3	–0.3	–0.3	–0.2
domestic use	0.3	0.1	0.3	0.4	0.4	0.4	0.5	0.5	0.5
of which wheat									
production	0.0	–0.2	0.0	–0.2	–0.2	–0.2	–0.2	–0.2	–0.2
domestic use	0.3	0.1	0.3	0.4	0.4	0.4	0.4	0.4	0.4
producer price	0.0	0.4	0.2	0.4	0.5	0.6	0.5	0.5	0.4
of which soft barley									
production	0.0	–0.1	–0.1	–0.2	–0.3	–0.3	–0.4	–0.3	–0.3
domestic use	0.3	0.2	0.4	0.5	0.6	0.6	0.7	0.7	0.6
producer price	0.2	0.1	0.2	0.3	0.4	0.4	0.3	0.3	0.3
Oilseeds									
production	0.0	2.5	3.2	3.7	5.0	5.7	5.4	4.7	4.0
domestic use	2.3	1.7	2.6	3.4	3.5	3.2	2.8	2.4	2.1
of which rapeseed									
production	0.0	3.9	4.9	5.6	7.8	8.9	8.4	7.3	6.3
domestic use	3.5	1.6	3.2	4.1	4.0	3.5	3.1	2.7	2.2
producer price	4.4	2.1	4.2	5.5	5.5	4.9	4.3	3.8	3.2
Beef and veal									
production	0.1	–0.1	0.0	0.1	0.2	0.4	0.6	0.7	0.9
domestic use	0.2	0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.1
producer price	0.5	0.2	0.4	0.6	0.6	0.5	0.4	0.4	0.3
Pork meat									
production	0.1	0.2	0.3	0.5	0.7	0.9	1.0	1.1	1.1
domestic use	–0.02	–0.01	–0.02	–0.03	–0.03	–0.03	–0.02	–0.02	–0.02
producer price	2.4	1.1	2.5	3.5	3.3	2.8	2.5	2.2	1.9
Poultry meat									
production	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
domestic use	0.3	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1
producer price	0.4	0.6	0.6	0.9	1.1	1.0	0.9	0.8	0.7
Milk production	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
milk prod. price	0.5	3.4	4.2	6.1	8.3	10.1	11.0	11.4	11.3
Butter									
production	0.2	0.6	0.9	1.3	1.7	2.0	2.2	2.3	2.3
domestic use	–0.1	0.1	–0.1	0.0	0.0	0.0	0.0	0.0	0.0
wholesale price	0.6	0.3	0.6	0.8	0.8	0.8	0.7	0.6	0.6
SMP									
production	3.2	5.7	7.3	9.7	12.4	14.8	16.6	17.9	18.6
domestic use	–1.0	0.1	–0.2	–0.1	0.4	0.9	1.4	1.6	1.8
wholesale price	2.3	1.2	2.4	3.1	3.2	3.0	2.7	2.5	2.2
Cheese									
production	0.2	0.8	1.1	1.6	2.2	2.6	2.8	2.9	2.9
domestic use	0.0	–0.4	–0.5	–0.7	–1.0	–1.1	–1.2	–1.2	–1.2
wholesale price	0.0	2.1	2.6	3.9	5.5	6.7	7.4	7.6	7.5

Source: Own calculations

Table 9. Exchange rate scenario ERC-2 (Euro = USD 1.3) results – percentage change from the baseline (%)

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total grains									
production	0.00	0.17	0.25	0.25	0.23	0.24	0.25	0.26	0.28
domestic use	–0.31	–0.39	–0.33	–0.36	–0.42	–0.48	–0.52	–0.55	–0.58
of which wheat									
production	0.00	0.19	0.22	0.16	0.15	0.18	0.20	0.21	0.21
domestic use	–0.31	–0.35	–0.29	–0.34	–0.40	–0.45	–0.48	–0.51	–0.54
producer price	0.00	–0.44	–0.62	–0.48	–0.40	–0.41	–0.46	–0.50	–0.55
of which soft barley									
production	0.00	0.13	0.24	0.32	0.33	0.32	0.31	0.32	0.34
domestic use	–0.31	–0.51	–0.50	–0.51	–0.57	–0.64	–0.71	–0.75	–0.79
producer price	–0.18	–0.32	–0.33	–0.30	–0.29	–0.30	–0.33	–0.37	–0.41
Oilseeds									
production	0.00	–2.74	–5.79	–5.96	–4.73	–4.08	–4.16	–4.48	–4.80
domestic use	–2.52	–4.03	–3.43	–2.74	–2.54	–2.67	–2.91	–3.11	–3.30
of which rapeseed									
production	0.00	–4.14	–8.85	–9.14	–7.28	–6.30	–6.43	–6.94	–7.45
domestic use	–3.72	–5.04	–3.69	–2.89	–2.83	–3.07	–3.38	–3.60	–3.81
producer price	–4.83	–6.62	–4.93	–3.92	–3.93	–4.35	–4.77	–5.17	–5.53
Beef and veal									
production	–0.08	0.02	0.06	–0.14	–0.40	–0.61	–0.75	–0.86	–0.96
domestic use	–0.18	–0.28	–0.25	–0.20	–0.18	–0.19	–0.22	–0.25	–0.27
producer price	–0.54	–0.73	–0.52	–0.40	–0.39	–0.43	–0.47	–0.53	–0.58
Pork meat									
production	–0.14	–0.31	–0.48	–0.66	–0.80	–0.92	–1.02	–1.12	–1.22
domestic use	0.03	0.04	0.03	0.02	0.02	0.02	0.03	0.03	0.03
producer price	–2.62	–3.66	–2.88	–2.36	–2.27	–2.43	–2.78	–3.13	–3.46
Poultry meat									
production	0.00	0.00	0.00	–0.01	0.00	0.00	0.00	0.00	0.00
domestic use	–0.30	–0.32	–0.19	–0.16	–0.16	–0.17	–0.19	–0.20	–0.21
producer price	–0.53	–1.18	–1.23	–0.91	–0.79	–0.84	–0.93	–1.03	–1.12
Milk production	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
milk producer price	–0.58	–4.37	–7.76	–8.89	–9.31	–9.83	–10.59	–11.53	–12.62
Butter									
production	–0.22	–0.88	–1.53	–1.88	–2.04	–2.16	–2.27	–2.40	–2.54
domestic use	0.15	0.06	–0.05	–0.03	0.00	0.01	0.01	0.01	0.01
wholesale price	–0.67	–0.97	–0.73	–0.60	–0.61	–0.69	–0.77	–0.86	–0.93
SMP									
production	–3.84	–10.38	–12.07	–12.66	–13.77	–15.48	–17.55	–19.94	–22.70
domestic use	1.25	1.03	–0.32	–1.00	–1.19	–1.24	–1.32	–1.44	–1.60
wholesale price	–2.73	–3.94	–3.01	–2.45	–2.49	–2.80	–3.12	–3.43	–3.75
Cheese									
production	–0.29	–1.17	–2.01	–2.37	–2.54	–2.69	–2.87	–3.10	–3.34
domestic use	0.00	0.39	0.91	1.11	1.13	1.12	1.16	1.20	1.26
wholesale price	0.00	–2.29	–5.01	–6.06	–6.35	–6.59	–7.02	–7.58	–8.23

Source: Own calculations

Table 10. Exchange rate scenario ERC-3 (Euro = USD 1.4) results– percentage change from the baseline (%)

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total grains									
production	0.00	0.25	0.33	0.35	0.35	0.36	0.38	0.38	0.40
domestic use	–0.46	–0.51	–0.48	–0.54	–0.63	–0.70	–0.76	–0.80	–0.83
of which wheat									
production	0.00	0.28	0.28	0.24	0.23	0.28	0.30	0.30	0.31
domestic use	–0.44	–0.45	–0.43	–0.51	–0.59	–0.65	–0.70	–0.74	–0.77
producer price	0.00	–0.65	–0.81	–0.69	–0.62	–0.64	–0.69	–0.73	–0.78
of which soft barley									
production	0.00	0.19	0.33	0.45	0.48	0.47	0.47	0.48	0.50
domestic use	–0.45	–0.69	–0.71	–0.76	–0.85	–0.95	–1.03	–1.09	–1.13
producer price	–0.26	–0.43	–0.47	–0.45	–0.44	–0.46	–0.49	–0.53	–0.57
Oilseeds									
production	0.00	–3.97	–7.87	–8.17	–6.98	–6.33	–6.36	–6.60	–6.85
domestic use	–3.65	–5.36	–4.83	–4.17	–3.96	–4.04	–4.25	–4.41	–4.55
of which rapeseed									
production	0.00	–6.00	–12.01	–12.51	–10.73	–9.77	–9.82	–10.21	–10.61
domestic use	–5.40	–6.60	–5.30	–4.53	–4.43	–4.61	–4.89	–5.07	–5.23
producer price	–7.04	–8.70	–7.12	–6.17	–6.18	–6.55	–6.93	–7.29	–7.62
Beef and veal									
production	–0.11	0.04	0.06	–0.20	–0.55	–0.84	–1.06	–1.24	–1.40
domestic use	–0.26	–0.38	–0.35	–0.32	–0.30	–0.29	–0.32	–0.35	–0.37
producer price	–0.79	–0.96	–0.76	–0.63	–0.62	–0.65	–0.69	–0.74	–0.80
Pork meat									
production	–0.20	–0.42	–0.68	–0.94	–1.17	–1.35	–1.50	–1.65	–1.79
domestic use	0.04	0.05	0.04	0.04	0.03	0.04	0.04	0.04	0.05
producer price	–3.82	–4.80	–4.16	–3.74	–3.59	–3.66	–4.02	–4.39	–4.73
Poultry meat									
production	0.00	0.00	–0.01	–0.01	–0.01	0.00	0.00	0.00	0.00
domestic use	–0.43	–0.41	–0.30	–0.26	–0.24	–0.25	–0.27	–0.28	–0.29
producer price	–0.80	–1.65	–1.70	–1.38	–1.27	–1.32	–1.41	–1.49	–1.58
Milk production	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
milk prod. price	–0.86	–6.23	–10.61	–12.46	–13.51	–14.56	–15.74	–17.00	–18.31
Butter									
production	–0.31	–1.23	–2.12	–2.65	–2.96	–3.17	–3.35	–3.53	–3.69
domestic use	0.22	0.06	–0.05	–0.03	0.00	0.01	0.01	0.01	0.01
wholesale price	–0.97	–1.28	–1.06	–0.93	–0.96	–1.05	–1.13	–1.21	–1.29
SMP									
production	–5.73	–14.38	–16.84	–18.18	–20.23	–23.01	–26.09	–29.44	–33.10
domestic use	1.88	1.28	–0.36	–1.27	–1.66	–1.87	–2.09	–2.33	–2.58
wholesale price	–4.08	–5.25	–4.32	–3.78	–3.85	–4.19	–4.53	–4.87	–5.21
Cheese									
production	–0.43	–1.66	–2.78	–3.36	–3.70	–3.99	–4.29	–4.59	–4.90
domestic use	0.00	0.56	1.24	1.55	1.63	1.66	1.73	1.77	1.83
wholesale price	0.00	–3.33	–6.82	–8.44	–9.17	–9.77	–10.45	–11.20	–11.99

Source: Own calculations

impact on gross agricultural income, which declines by 1.6% in 2015 relative to the baseline because of modulation.

Weak Euro leads to higher prices, higher production and lower consumption. Change of the exchange rate causes some substitution in consumption because it affects the relative prices.

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Contact address:

Pavel Ciaian, Slovak University of Agriculture in Nitra, Tr. A. Hlinku 2, 949 76 Nitra, Slovak Republic
tel.: +421 376 414 593, e-mail: ciaian@yahoo.com, jan.pokrivcak@uniag.sk, lubica.bartova@ec.europa.eu, dusan.drabik@fem.uniag.sk