The Austrian agricultural sector in 2013 – Management and environmental perspectives

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Abstract

Long-term policies must be based on reliable forecasts of economic development. This paper presents a base-line scenario of the Austrian agricultural sector until 2013. It is based on a spatially differentiated sector model that captures both EU and national policies in a detailed manner. Emphasis is put on environmental measures, which focus on land use and farm management. The policies we consider particularly are the implementation of the CAP reform 2003 and the introduction of the new programme for rural development. The results show that the single farm payment, which was introduced in 2005, will have considerable consequences on land uses. The model results capture the combined effects of technical progress and reduced policy intervention in agricultural markets. Model results can be summarized as follows: (i) production is likely to become less intensive, (ii) environmentally friendly production methods become more attractive for farmers, and (iii) agricultural land will not be abandoned.

Keywords: Common Agricultural Policy, Austria, environmental policy

1. Introduction

Two recent events have changed the operating framework of Austrian farms: (i) the EU-accession of ten new Member States in 2004 of which four are neighbouring countries of Austria, and (ii) the implementation of a reformed Common Agricultural Policy (CAP) in 2005.

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The EU enlargement has boosted the trade of agricultural commodities and food. The Austrian food processing sector benefited from a better access to new consumers and to additional suppliers. Farmers also benefit from a competitive food processing sector by potentially more commodity sales, but it also means additional pressure on commodity prices.

In 2003, EU farm ministers decided to reform the CAP. From 2005 on, direct payments, which were previously linked to outputs, will be linked to agricultural land as well as to environmental and animal welfare standards. Farmers are no longer required to produce specific crops or raise ruminants to benefit from support measures. An additional component of the reform package was the adjustment of a set of market organisations aiming at aligning EU domestic farm prices with world market prices (SINABELL and SCHMID, 2005). This reform component is not yet fully implemented. Notably the EU prices for sugar and milk products (butter and skimmed milk powder) are still deviating from world market prices.

The projections presented in this paper span a decade to the year 2013. It is assumed that the current CAP will stay unchanged and be implemented according to the decisions made in 2003. Furthermore, the scenarios presented in this analysis are based on several core assumptions:

- Farm commodity prices are exogenously determined (see OECD, 2004; details are given in table 2 in the appendix). It is based on the small country assumption, because the Austrian agricultural sector represents only 2% of the EU agricultural markets. Therefore developments in Austria are expected to have no significant consequences on EU and world markets. Prices of commercial non-farm inputs are assumed to remain constant in real terms.
- The programme for rural development (dubbed "the second pillar of the CAP") is of major importance in Austria. Based on the decisions made by farm ministers in summer 2005 (CEC, 2005a), we expect that the volume of total transfers is kept constant. We further assume that the volume of funds for agri-environmental measures and support for farms in less-favoured areas will be reduced and therefore more funds will be available for other measures (e.g. investment aid).
- A moderate technical progress in plant and animal production will lead to slightly higher average crop yields per hectare and more

productive milk cows (assumptions are based on SINABELL and SCHMID, 2004 and , 2005).

- Exogenous economic assumptions for Austria (like GDP or population size) are not explicitly considered in this analysis. Agricultural production is mainly driven by resource availability, prices, and technological development. Since Austrian agriculture is an integrated part of the common market, European demand patterns carry over and determine the results via price transmissions.

2. PASMA – an Austrian Agricultural Sector Model

The Positive Agricultural Sector Model Austria (PASMA) is used to estimate the impact of the 2003 CAP reform on selected agricultural and environmental indicators to measure rural and agricultural development. PASMA depicts the political, natural, and structural complexity of Austrian farming in a very detailed manner.

The model structure ensures a broad representation of production and income possibilities that are essential in comprehensive policy analyses. Data from the Integrated Administration and Control System (IACS), Economic Agricultural Account (EAA), Agricultural Structural Census (ASC), Farm Accountancy Data Network (FADN), the Standard Gross Margin Catalogue, and the Standard Farm Labour Estimates provide necessary information on resource and production endowments for 40 regional and structural (i.e. alpine farming zones) production units in Austria.

The model considers conventional and organic production systems (crop and livestock), all other relevant management measures from the Austrian agri-environmental programme (ÖPUL), and the support programme for farms in less-favoured areas (LFA). Thus, the two most important components of the programme for rural development are covered on a measure by measure basis.

The model maximises farm welfare and is calibrated to historic crop, forestry, livestock, and farm tourism activities by using the method of Positive Mathematical Programming (PMP). PMP was initially published by HOWITT (1995**)** and has been modified and applied in several models (e.g. LEE and HOWITT, 1996, RÖHM and DABBERT, 2003).

PASMA is a set of three almost identical Linear Programming (LP) models. The purpose of the first one is to assign all farm activity levels

i.e. crop, forestry, livestock, farm tourism, and remaining cost shares from feed and manure balances. For instance, the area of meadows is recorded in various data sources listed above. However, information on which activities are actually carried out and to what extent are not available (e.g. grazing, hay, silage, or green fodder production activities). In the model, these activities and remaining cost shares (i.e. fertilizer and feed) are accordingly assigned using historical livestock records and detailed feed and fertilizer balances (phase 1). Phase 2 is the second LP in which the perturbations coefficients (HOWITT, 1995) are incorporated to compute the calibration coefficients of a linear marginal cost curve primarily following the approach of RÖHM and DABBERT (2003). The third LP (phase 3) is the actual policy model. Calibration coefficients are built in using linear approximation techniques that allow calibration of crop, forestry, livestock, and farm tourism activities to observed and estimated shares (SCHMID and SINABELL, 2005). Other model features such as convex combinations of crop and feed mixes, expansion, reduction and conversion of livestock production, a transport matrix, and imports of feed and livestock are included to allow reasonable responses in production under various policy scenarios.

3. Austrian agriculture in the next decade: the farm policy framework

The model is simulated for a number of years for which important policy changes are expected. The introduction of the decoupled premium takes place in 2005 for most commodities, only some premiums will remain coupled completely (e.g. suckler cows and heifers), or partly (40% of slaughter premiums).

By 2008 the milk reform will be completed and in the same year the new programme for rural development will likely be implemented. The agricultural policy of the first pillar is (more or less) guaranteed to be financed until the production year 2013/2014.

Due to uncertainties concerning the flow of funds from 'modulation' (a cut of support for larger farms) we make the assumption that Austrian farms who might be beneficiaries will get the same amount as other farms loose through this measure. Therefore, the flows cancel out at sector level.

An important assumption is that land will be maintained in good agricultural and ecological condition ('cross compliance'). This is a prerequisite for obtaining de-coupled farm payments. According to the Austrian CAP implementation (e.g. individual farm payments), de-coupled payments are different across farms and regions.

4. Austrian agriculture in the next decade: scenario results and discussion

Selected model results of the scenario analysis are listed in Table 1. Summarizing these results we find that:

- Farm incomes at sector level (measured as producer surplus) will decline until 2008 but rise thereafter which is mainly due to improving real terms of trade, ongoing technical progress and structural change – driving forces which are exogenously given by assumption.
- Per capita farm income (measured as producer surplus per annual working unit) is likely to increase even if we do not assume an exogenously driven decline of farm labour.
- Rising incomes are also a consequence of structural adjustments which allow cost savings in crop and livestock production (mainly cattle).
- The acreage of agricultural farm land will not change significantly. This is the consequence of the 'cross compliance' measure, the contingency of farm payments on maintenance of farm land. However, arable land will be turned to grassland and the acreage of extensive grassland will be expanded.
- Organic farming will become more attractive for farmers, mainly due to the assumption that premiums of the agri-environmental programme will remain. Other reasons are higher commodity prices for organic products, while opportunity costs will be lower after the implementation of the reform. Conventional farming will become more extensive, the acreage of arable land managed conventionally will decline.

Table 1: The Austrian agricultural sector in 2008 and 2013 compared to 2003 in percent change

	unit	**2008**	**2013**
farm income indicators			
producer surplus agricultural sector[1)]	Euro	-0.2	2.4
producer surplus per farm labor unit	Euro	1.6	5.1
farm labor	AWU	-1.8	-3.0
variable cost			
plant production	Euro	-2.8	-3.5
livestock production	Euro	-3.1	-4.8
land allocation			
utilized agricultural land	ha	0.0	-0.4
arable land	ha	-4.4	-5.7
grassland (excluding alpine meadows)	ha	5.5	6.2
crops on arable land			
conventional production			
cereals (including maize)	ha	-4.6	-5.9
protein crops	ha	-7.0	-9.0
oil-seeds	ha	-4.0	-4.8
forage crops	ha	-4.8	-7.7
other crops	ha	-3.8	-4.8
set aside	ha	-4.0	-4.9
total	ha	-4.6	-6.0
organic production			
cereals (including maize)	ha	1.5	2.5
protein crops	ha	8.3	15.0
oil-seeds	ha	-1.1	-1.5
forage crops	ha	-2.9	-4.5
other crops	ha	-1.1	-1.1
set aside	ha	0.3	0.7
total	ha	0.0	0.3
livestock production			
beef and veal	t	-2.0	-3.0
pork	t	-1.4	-0.9
poultry meat	t	0.0	0.0
sheep meat	t	2.5	2.5
goat meat	t	-7.4	-7.3

Source: own estimates; AWU – annual working units

Notes: 1) sum of market revenues minus operating expenses plus farm policy transfers including decoupled payments.

- The output of beef will drop, which is due to different factors: the number of heads of cattle will decline significantly (approximately 10% depending on the particular type), partly because of productivity gains (milk cows), and partly due to decoupling (bulls and oxen). If premiums for suckler cows were decoupled as well, we would expect an even larger decline of output.
- Milk production will be maintained in most regions despite a significant decline in prices. Total milk production will expand by 1.5% according to the increase in total quota.
- The output of pork and poultry meat is not significantly affected by the 2003 CAP reform.

5. Conclusions

Our results show that the single farm payment, which was introduced in 2005 will have an important effect on land allocation. Because this payment is only granted if land is maintained in good agricultural and ecological condition, farmland is kept in production which otherwise would most likely have been abandoned.

The scenario analysis shows the combined effect of technical progress and reduced policy intervention in agricultural markets: production is likely to become less intensive, environmentally friendly production methods are more attractive for farmers and the environmental situation is likely to improve. Because sectoral farm incomes are expected to improve, the Austrian agricultural sector is likely to benefit from the reformed CAP in an enlarged EU.

Compared to similar forecasts published by the European Commission (CEC, 2005b), our results are less optimistic concerning farm incomes, while the other results are rather similar. The main explanation for the deviating results are different assumption on structural change in farm employment. We do not assume an exogenously given declining trend of farm labour, in our results farm labour requirements are declining only at the rate that is determined by output reductions.

The income indicator used in this analysis does not cover all aspects of farm welfare. Wealth effects like values of farm land and values of production quota (milk, sugar beet) are only indirectly accounted for via changing shadow values (which generally decline). Regional patterns of shadow values show that not all regions will be affected in

the same way. More detailed analyses are necessary to evaluate the detailed consequences of such developments.

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Appendix

Table 2: Assumptions on selected nominal farm prices in Austria

product	base price	organic prices[1)]	unit	price relatives in	
				2008	2013
wheat	111.8	178.9	in €/t	0.90	0.88
rye	105.4	158.1	in €/t	0.91	0.90
summer barley	100.2	75.1	in €/t	0.91	0.90
oats	95.1	57.1	in €/t	0.91	0.90
maize	106.1	84.9	in €/t	0.91	0.90
beans	140.0	105	in €/t	0.85	0.84
sugar-beet	46.1	-	in €/t	1.00	1.00
rape-seed	157.4	118.1	in €/t	1.36	1.36
veal	4.3	1.1	in €/kg SW	0.94	1.01
heifer for suckler cow	783.1	55	in €/head	0.94	1.01
lamb	4.0	4.6	in €/kg SW	0.94	1.01
beef (oxen)	2.5	2.9	in €/kg SW	0.94	1.01
pork	1.4	0.4	in €/kg SW	0.96	0.93
beef	2.6	0.3	in €/kg SW	0.94	1.01
turkey	2.8	4.2	in €/kg SW	0.93	0.91
eggs	0.1	0.1	in €/egg	0.93	0.91
chicken	1.8	2.8	in €/kg SW	0.93	0.91
young sow	264.2	90.3	in €/head	0.96	0.93
sow	0.9	0.2	in €/kg SW	0.96	0.93
milk-A-quota	303.9	27.9	in €/t	0.83	0.83
milk-D-quota	334.3	30.7	in €/t	0.83	0.83

Source: own assumptions based on OECD, 2004. SW: slaughter weight
Note: [1)] Price mark-up for organic products based on conventional prices.