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IMPACT OF THE WTO LIBERALISATION ON ORGANIC FARMING IN SWITZERLAND

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Abstract

This paper outlines the potential impact of current WTO trade talks on land use, livestock husbandry and financial performance of organic and non-organic farms in Switzerland. The results of the analysis conducted suggest that organic farms would respond to a potential WTO trade agreement in a similar way than non-organic farms. Due to falling commodity prices, it is expected that revenues from agricultural production will decrease and cause a significant reduction in agricultural incomes. The results indicate that, on average, organic farms are less severely affected by the WTO liberalisation than non-organic farms. Accordingly, the relative profitability of organic farms is likely to improve with increased liberalisation.

Key words: WTO liberalisation, organic farming, policy impact assessment

1. Introduction

Although a number of policies measures have been implemented in Switzerland since the 1990s with the aim to improve the competitiveness of the farming sector (Schweizerische Bundesrat, 2006), Swiss farms still produce at much higher costs than their colleagues in other countries. For example, Gazzarin (2002) reported that EU dairy farms have a break-even point that is 30-38% lower than comparable farms in Switzerland, although dairy production has the lowest comparative cost disadvantages. According to Lehmann *et al.* (2005), specialised pig and poultry farms have production costs that are, on average, twice as high as those of comparable farms in the EU. In light of the poor international competitiveness of Swiss agriculture, there is ongoing public debate about the necessity of a further, more radical liberalisation of food markets and possible financial implications for Swiss farm households (Wasescha, 2002). Among others, there is a discussion on the pros and cons of the current WTO Doha trade talks. On the one hand, it is expected that improved market access for foreign commodities could lead to severe income losses for farmers. On the other hand, multilateral efforts towards liberalisation are important for Switzerland because, first, in view of the small size of the country, access to foreign markets is essential for the national economy of Switzerland; and second, multilateral negotiations provide an opportunity for Switzerland to form alliances with other countries in order to increase its bargaining power.

Against this background, this paper presents model results on the potential impact of the current WTO trade talks on land use, livestock husbandry and financial performance of organic and non-organic farms in Switzerland. An analysis based on differentiations between farming systems is of special interest because:

- organic farming has become an important farming system in Switzerland. This is particularly true for mountain farms where approximately 20% of the farmland and of the farms themselves are managed organically, as well as for dairy and beef farms, of which 15% and 25% respectively are managed organically (FiBL, 2005).

- experiences from Austria (Kola *et al.*, 2000) with EU accession as well as experiences from various EU countries with Agenda 2000 (Nieberg *et al.*, 2005) and with the 2003 CAP reform (Jacobsen, 2004; Offermann and Nieberg, 2006; Schmid and Sinabell, 2007) indicate that organic farms are likely to be less affected financially by liberalisation policies than non-organic farms if price support is transferred to direct payments. However, due to different economic, geographical, structural and legal framework conditions, these experiences cannot be applied directly to the Swiss situation.

This paper is structured as followed. In the second section the modelling approach employed for the analysis is described. This is followed by a brief overview on the current WTO trade talks and scenarios used for the model analysis. The results of the model analysis are described in the fourth section. Finally, some conclusions are drawn.

2. Methodology

The assessment of the impact of the WTO Doha Round on organic and non-organic farming was done using the sector-consistent farm group model CH-FARMIS, which is a further development of the well-established European sector model EU-FARMIS (Offermann *et al.* 2005). CH-FARMIS is a comparative static, process analytical, non-linear programming model that allows a separate assessment of the impacts of policies on organic and non-organic farming in Switzerland (Sanders *et al.*, 2008). The agricultural sector is represented by thirty farm groups, which can be characterised by their farming system, farm type and geographic location. Book keeping data from the Swiss FADN was used as a primary source for the model. By applying farm-specific weighting factors, farm data were aggregated to sector accounts. The technical coefficients of the farm model were either taken directly from farm accounts or calculated on the basis of normative data. Agricultural production is represented by 29 crop activities and 15 livestock activities. The factor allocation and production of each farm group is optimised by maximising farm income under policy and management restrictions. The restrictions cover the area of land and labour use, livestock feeding, fertiliser balance, rearing of young stock, allocation of direct payments and requirements with respect to the organic production system. A positive mathematical programming approach (PMP) was used to calibrate the production activities in the base year to observed activity levels.

3. WTO Doha Round and model assumptions

Since 2001, the WTO Doha Round seeks to reduce substantially existing trade distorting measures among member states. Negotiations on the Doha Development Agenda were officially suspended in July 2006, mainly because participants were not able to agree on specific targets for market access and domestic support. In February 2007, however, the Doha negotiations have been resumed and a new draft on modalities has been presented in July 2007. This draft envisages the abolition of export

subsidies, a reduction of domestic price support in the range of 50-75% and a reduction of tariffs in the range of 48-73% (WTO, 2007).

For the model analysis, two scenarios were specified. First, a reference scenario was defined based on the hypothetical assumption that no further policy changes will occur until the year 2013. This scenario takes into consideration the phasing out of the milk quota regime by 2009 and implementation of free trade for cheese between Switzerland and the EU in 2007. The second scenario comprises of possible changes caused by the WTO Doha liberalisation. Referring to the revised draft modalities for agricultural (Falconer paper), it has been assumed that prices of the most important commodities drop in the range of 50-82% (see Table 1). These price projections (for non-organic commodities) are based on results of a tariff model as well as expert knowledge. So far no empirical evidence exists to indicate whether producer prices for organic products will fall to a similar extent as prices for non-organic products as a result of liberalisation policies. For this analysis, it has been assumed that price for organic products drop to a similar extent. A further assumption has been that the most important direct payments change as follows: increase in payment rates for arable land from 400 to 600 CHF/ha, abolition of the deduction of RGVE payments for milk produced, unification and reduction of the RGVE payments to 600 CHF.

Table 1 Price assumptions for crop and livestock products

Product	Basyr	Reference	WTOLIB
	2000/01	2013	2013
	<i>Relative price level (%)</i>		
Cereals	100	96	72
Sugar beet	100	69	50
Pulses	100	95	82
Potatoes	100	96	69
Milk	100	87	66
Beef	100	100	82
Pork	100	100	70
Table birds	100	99	71

4. Results

In the following, the effects of a WTO liberalisation on land use, livestock husbandry and financial performance are described for different organic and non-organic farm type groups. All results refer to the year 2013 and are based on the assumption that the number of farms and therefore the farm group composition will not changed in the target year.

4.1 Impact on land use and livestock husbandry

Model results indicate that changes in arable land are marginal apart from organic mixed farms. For this farm type, a decline from 4.5 to 4.0 ha is anticipated (which is mainly related to a lower wheat

production,). The small reduction of arable land reflects the low importance of cropping activities on organic dairy and beef farms (less than 1 ha). Furthermore, it corresponds to the decline in producer prices for arable crops. Since organic mixed farms have a relatively high proportion of arable land, this farm group is more affected by lower crop prices. Changes in grassland are only marginal for all organic farm type groups. As a result of lower prices, organic farm type groups generally keep fewer dairy cows and beef cattle apart from organic beef farms, where the number of dairy cattle remains almost constant. The number of pigs decreases for all organic farm type groups whereas the number of poultry is constant or even higher in the three liberalisation scenarios.

As described for organic farm type groups, arable land (i.e. mainly barley and wheat) decreases on non-organic beef and mixed farms. In contrast, the area of arable land increases marginally on non-organic dairy farms, due to an expansion in fodder maize production. Grassland in the non-organic farm type groups is almost unchanged, pointing to changes in the relative profitability of grassland-based enterprises (particularly dairy cows) compared to other farm enterprises. As a result of lower commodity prices, non-organic farm type groups keep fewer dairy cows, beef cattle and pigs in WTO scenarios compared to the reference scenario. The greatest relative reduction can be observed for pigs. Because prices for eggs and table birds are expected to decline less drastically, the number of poultry increases for non-organic dairy and beef farms.

4.2 Impact on financial performance

The effects of the assumed policy changes on farm revenues and production costs of organic farm type groups are presented in Table 2. The model results suggest that crop revenues decrease in line with the price projections for crop products. Similar observations can be made with respect to revenues from livestock production. This is particularly true for revenues from dairy, pig and poultry production. Total revenues from agricultural production decrease by -25% (organic dairy farms) and -26% (organic beef and mixed farms).

Table 2 Impact on financial performance of organic farm type groups (in kCHF)

	Organic DAIRY			Organic BEEF			Organic MIXED		
	Reference	WTOLIB	% Change	Reference	WTOLIB	% Change	Reference	WTOLIB	% Change
Revenues									
Agricultural production	90.94	68.57	-25	45.99	33.81	-26	123.67	91.89	-26
Crops	8.00	7.07	-12	4.55	3.79	-17	31.29	23.75	-24
Dairy	64.08	46.45	-28	3.20	2.87	-10	46.03	33.34	-28
Beef	4.78	3.94	-18	32.60	23.60	-28	13.28	9.95	-25
Pig/Poultry	6.03	3.13	-48	4.33	2.29	-47	24.14	16.66	-31
Others	8.06	7.98	-1	1.32	1.26	-4	8.95	8.19	-8
Direct payments	49.92	63.84	28	60.53	57.32	-5	50.03	57.62	15
Production costs									
Fix costs	-65.32	-65.37	0	-51.04	-45.14	-12	-80.77	-74.95	-7
Variable costs	-21.77	-17.75	-18	-19.78	-16.73	-15	-41.02	-33.61	-18
Agricultural income	56.25	51.75	-8	40.54	34.11	-16	61.60	50.65	-18

The projected changes in direct payments can be described as follows. Organic dairy and mixed farms receive more direct payments in the WTO scenario (+28% and +15% respectively). This increase is

due mainly to higher direct payment rates for arable land as well as the abolition of deduction of RGVE payments for produced milk. Because it has been assumed that the RGVE payments for beef cattle decline from CHF 900/LU to CHF 600/LU, organic beef farms receive fewer direct payments under WTO conditions.

Changes in fixed costs are determined largely by changes in labour and depreciation costs. Since labour input remains constant, organic dairy farms spend the same amount of money on labour under the WTOLIB scenarios compared to the reference situation. In contrast to this, organic beef farms and mixed farms require less labour and consequently have lower labour costs. In addition, both farm groups have lower depreciation costs. Both results can be explained by the lower production activities under the WTOLIB scenarios. Variable costs decrease on all organic farm type groups as a result of lower prices for agricultural inputs in general and lower feeding costs in particular.

Agricultural incomes of organic farm type groups are lower under the WTO scenario than in the reference situation. According to the model results, agricultural incomes decrease particularly on organic mixed farms. Here, income is reduced by approximately 11,000 CHF, whereas organic dairy and beef farms suffer a reduction of approximately 4,000 CHF and 6,000 CHF, respectively. The sharper income reduction on organic mixed farms can be attributed mainly to the fact that revenues from agricultural production make up a higher proportion of agricultural income, which makes this farm type group particularly vulnerable to price cuts. In addition, organic mixed farms produce more arable crops, pig meat and table birds than organic dairy and beef farms, which are particularly affected by the decline in prices.

Changes in farm revenues and production costs of non-organic farm type groups are presented in Table 3. The assumed policy changes in the WTOLIB scenario lead to considerable lower revenues of agricultural production for all three non-organic farm type groups. The greatest reduction can be observed for non-organic mixed farms, which is due to the relative high production level of arable crops, dairy cows and pigs/poultry as well as the assumption that these commodities face the greatest price cuts.

Table 3 Model results for non-organic farm type groups

	Non-Organic DAIRY			Non-Organic BEEF			Non-organic MIXED		
	Reference	WTOLIB	% Change	Reference	WTOLIB	% Change	Reference	WTOLIB	% Change
Revenues									
Agricultural production	101.35	74.73	-26	64.82	48.53	-25	176.01	118.93	-32
Crops	8.63	7.48	-13	3.75	3.63	-3	37.43	27.98	-25
Dairy	65.64	46.15	-30	5.49	4.75	-14	61.46	44.93	-27
Beef	14.07	11.16	-21	50.22	36.05	-28	22.20	16.86	-24
Pig/Poultry	7.07	3.59	-49	2.00	1.09	-46	49.88	24.06	-52
Others	0.75	0.64	-15	0.26	0.24	-7	7.71	5.28	-32
Direct payments	38.74	51.41	33	51.24	49.18	-4	38.55	52.53	36
Production costs									
Fix costs	-57.58	-56.22	-2	-45.11	-43.46	-4	-82.97	-77.34	-7
Variable costs	-32.89	-27.54	-16	-30.30	-23.82	-21	-68.47	-52.66	-23
Agricultural income	49.31	42.06	-15	43.48	33.26	-24	65.71	44.05	-33

The changes in direct payments have similar effects for non-organic farm type groups as described for organic farm type groups. Non-organic dairy and mixed farms receive more direct payments under the WTOLIB scenario than in the reference situation, whereas non-organic beef farms receive less. These farms have lower direct payment receipts in the WTOLIB scenarios than in the reference situation due to the reduction in RGVE payments for beef cattle (i.e. from CHF 900/LU to CHF 600/LU).

Fixed costs decrease only slightly in the WTOLIB scenarios. The decrease is again mainly a consequence of lower labour and depreciation costs, which in turn is due to lower activity levels. Relative savings in variable costs are similar for non-organic dairy and beef farms, whereas non-organic mixed farms achieve the greatest reduction. These farms benefit particularly from cheaper feedstuffs for pigs and poultry.

Agricultural income of non-organic farm type groups corresponds to the figures observed for organic farm type groups. However, income losses are somewhat greater. Comparing the income performance of the three non-organic farm types, non-organic mixed farms suffer the greatest reduction in agricultural incomes (-33%). Agricultural incomes of non-organic dairy farms decrease by 15% and non-organic beef farms have 24% lower incomes. As described for organic farm type groups, lower agricultural incomes are mainly a result of lower commodity prices that are not outweighed by lower input prices and higher direct payments or changes in farm management.

4.3 Comparison of organic and non-organic farm type groups

If one compares the results of organic and non-organic farm type groups, it becomes apparent that organic and non-organic farms generally respond in the same way to agricultural liberalisation policies; both reduce the level of production activities in order to reduce production costs. This result suggests that the farming system (for example, rotational constraints) has no or only little impact on the behavioural response to lower prices.

Comparing the respective financial performance of organic and non-organic farm type groups, it appears that the assumed liberalisation policies have different effects on revenues as well as on fixed and variable costs. In relative terms, revenues from agricultural production fall to a comparable extent on organic and non-organic dairy and beef farms. A relatively lower decrease in revenues from agricultural production can be observed on organic mixed farms, since they suffer less from lower crop and pork meat prices than non-organic mixed farms. In absolute terms, all non-organic farm type groups suffer a substantial higher reduction than the corresponding non-organic farm groups. Changes in direct payments are similar for organic and non-organic dairy and beef farms. In contrast to this, non-organic mixed farms benefit relatively more from the higher contributions for dairy cows and arable crops.

If one compares the various impacts on production costs, the following observations can be made. Non-organic dairy farms are able to reduce slightly their fixed costs. This is not the case for organic dairy farms. This is due mainly to the greater reduction of production activities. For the same reasons, organic beef farms achieve a greater cost reduction than non-organic beef farms. No substantial differences can be observed with respect to absolute and relative changes in fixed costs on organic and

non-organic mixed farms. Furthermore, non-organic farm type groups reduce their variable costs to a greater extent than organic farm type groups. An explanation for this is the slightly greater reduction in livestock production on non-organic farms. Furthermore, they use less home-produced feedstuffs and consequently have much higher feeding costs. Therefore, they benefit more from decreased prices for feedstuffs, which result in a relatively greater reduction in variable costs.

Changes in the relative profitability of organic farm type groups (i.e. changes in the relation of agricultural income of organic farms to agricultural income of non-organic farms) indicate that organic farm type groups achieve a higher profitability compared to non-organic farm type groups. This is particularly true for organic dairy farms. Furthermore, the model results indicate that the relative profitability of organic farm type groups improves if agricultural markets are liberalised. The greatest improvement can be observed for organic mixed farms.

4. Conclusions

The model results presented in this paper suggest that the WTO liberalisation could lead to severe consequences for organic and non-organic farming. As a result of lower commodity prices, it is expected that incomes will substantially fall. This implies that organic and non-organic farms are only partially able to compensate for lower commodity prices through lower production costs, higher direct payments or changes in farm management. According to the modelling outcomes, organic farms are less severely affected financially under liberalised conditions than non-organic farms. This is mainly due to the fact that organic farms receive less revenues from agricultural production which makes them less vulnerable to price cuts. Consequently, the results provide a basis to assume that the relative profitability of the organic farming sector is likely to improve as a result of agricultural liberalisation. In view of the prospect that organic farms are likely to be less severely affected financially by a WTO agreement, conversion to organic farming appears to be a potential strategy for improving or maintaining the viability of non-farm businesses. However, further research would be necessary, in order to identify possible consequences for prices of organic commodities and to what extent lower prices affect the viability of organic farms.

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