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On the performance of the agricultural sectors in Norway and Switzerland

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Preface

The discussion paper is part of the research project "Agriculture and Fisheries Policies between International Regimes on Trade and the Environment" (2006-2009) financed by the Research Council of Norway. It presents a comparison of agriculture and agricultural policies in Switzerland and Norway since around 1990. The aim of the paper is to give an overview of the development of the agricultural sectors in the period from 1990 up to date. Documenting the developments will provide a basis for further analysis on the causes of those developments.

This paper has been prepared for presentation at an internal seminar at NILF 16. December 2009. Comments and feedback at this seminar have been incorporated in this version of the paper.

Oslo, February 2010

Klaus Mittenzwei

Copie of this discussion paper are available at
http://www.nilf.no/Publikasjoner/DP/En/2010/DP-2010-02.pdf

Content

1 Introduction

The primary aim of this paper is to compare the performance of the agricultural sector in Switzerland and Norway after 1990. The main motivation for this undertaking is the observation that the two countries seem to have reacted in different ways to the growing process of internationalization and globalization of agricultural policies starting in the second half of the 1980s. The Organization for Economic Co-operation and Development (OECD) was one of the first to start this process by establishing a quantitative measure of agricultural protection (the so-called PSE – Producer Subsidy Equivalent, renamed Producer Support Estimate) that in a simple and transparent fashion put focus on agricultural protection in OECD countries and allowed cross-country comparison. The GATT Uruguay-round negotiations in which agriculture was an integral part of the negotiations for the first time, but also a major obstacle, started at about the same time (1986) and was finished in 1994. It established the WTO, the successor of the GATT, and upper limits for different categories of agricultural support. In Norway, European integration went a step further through the European Economic Area (EEA) that created free movement of commodities, services, labor and capital between EU-countries and EFTA-countries. The Norwegian negotiations on EU-membership in 1994 are also an example of growing internationalization and globalization.

Switzerland and Norway exhibit similar natural and political conditions for its agricultures: Unfavorable natural conditions due to geography are partially compensated by favorable political conditions in the sense that both countries have a high level of ambition regarding agricultural policies. Somewhat surprisingly, therefore, the two countries seem to have taken different approaches to adjust to the new international framework conditions. It seems that Switzerland has gone through considerable reforms by first reformulating the (multifunctional) goals of agricultural policies and then targeting policy instruments in stepwise reforms. In Norway, the principle objectives of agricultural policies do not seem to have changed over the period, although the way to justify government intervention was modified by putting focus on agriculture's multifunctionality. Policy instruments were changed gradually triggered by the annual negotiations between the government and the farmers' organizations on administrative prices and subsidies, but remained more or less the same on the broad scale.

This paper does not attempt to answer the question why the two countries have chosen seemingly different paths of adjustment. It aims to provide some of the background and empirical data necessary to answer that question.

2 Measuring the performance of agricultural policy

There exists a comprehensive literature, both theoretically and empirically, on how to measure the performance of agriculture and agricultural policies (Bullock et al. 1999). Policies are commonly evaluated to which extent they contribute to the fulfilment of agricultural policy objectives. As policy objectives may vary between countries, it may be difficult to compare agricultural policies. This creates a need for principal criteria to be used in a comparative analysis. The concept of sustainability may be used as such an idea as it has been accepted and adopted by the international community. In fact, sustainability considerations have been made an integral part of the policy decision-making processes in Switzerland, Norway and the European Union (EU).

With regard to agriculture, the concept of sustainability is broken down in different components including economic, ecological and social aspects (Federal Office for Agriculture [FOAG] 2005, European Commission 2001, Gazzarin *et al.* 2004, Henning and Glauben 2000). Table 1 summarizes this work and presents sustainability indicators along the two axes area and dimension. Each axis is divided into three components. Resources, efficiency and equity are components of the axis area, while the area dimension is divided into economics, ecology and social concerns.

Table 1. Sustainability indicators

Area/Dimension	Economics	Ecology	Social concerns
Resources	1.1.1 Capital replacement 1.1.2 Capital stock 1.1.3 Agricultural area (stock) 1.1.4 Share of arable land	1.2.1 Biodiversity 1.2.2 Share of ecological area 1.2.3 Water 1.2.4. Soil quality	3.1.1 Education 3.1.2 Number of farms 3.1.3 Regional share of production value 3.1.4 Regional share of agricultural area 3.1.5 Regional share of arable land
Efficiency	2.1.1 Overall competitiveness 2.1.2 Competitiveness milk 2.1.3 Competitiveness red meat 2.1.4 Competitiveness white meat 2.1.5 Competitiveness cereals 2.1.6 Labor productivity 2.1.7 Viability of holdings	2.2.1 Energy efficiency 2.2.2 GHG-emissions 2.2.3 N-emissions	
Equity	3.1.3 Regional share of production value 3.1.4 Regional share of agricultural area 3.1.5 Regional share of arable land		3.3.1 Income comparison with off-farm income 3.3.2 Quality of life comparison with off-farm population

Source: EU 2001, FOAG 2005, Henning and Glauben 2000, own work

The set-up of sustainability indicators along the two axes shown in table 1 is common for Switzerland and the EU. Switzerland has developed a series of indicators that fit into the matrix of table 1, and publishes the indicators on an annual basis since 2005. The EU has also developed indicators, but whether they are published is uncertain. To the best of my knowledge, there is no set of sustainability indicators available in Norway, although many of the indicators are produced (else this discussion paper would not have been possible).

Not all of the indicators shown in table 1 can be found in the EU and Switzerland. Somewhat surprisingly, the Swiss sustainability indicators do not cover any regional concerns although agriculture's commitment to provide decentralised settlement has been made part of the Swiss constitution. In the EU, regional concerns fall within equity (over space). Competitiveness is neither listed in the EU or Switzerland, but taken from Henning and Glauben (2005).

3 Indicators

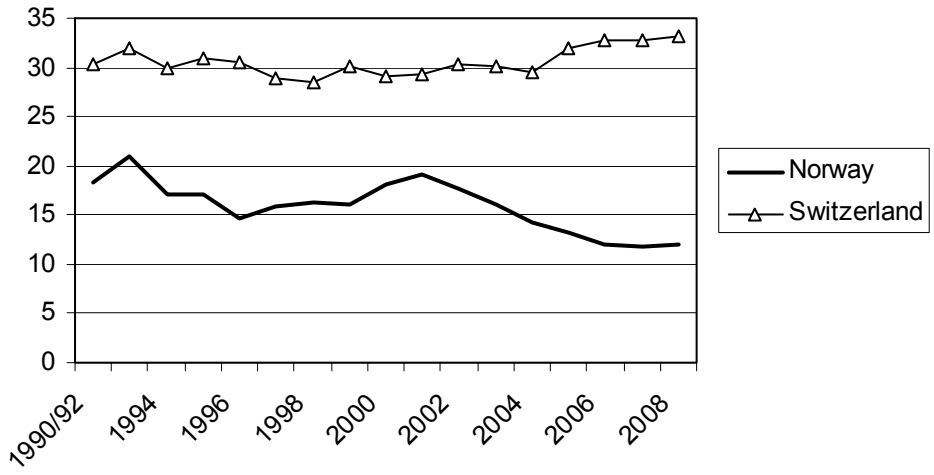
This section presents the sustainability indicators in table 1. Data are given for Norway and Switzerland. For some indicators, data for the EU-15 or single EU member states are presented. EU-15 is chosen because this gives a reasonable comparison for the time period 1990 to 2009.

The presentation follows the axes mentioned in table 1. First, indicators regarding resources are shown, followed by indictors regarding efficiency, while indicators regarding equity are shown at the end.

3.1 Indicators regarding resources (area 1)

Resources are basic requirements of any production process. Important (physical) resources with respect to agriculture are land, labor and capital. Capital is sometimes split up in physical capital and social capital. Other resources include intermediate inputs (produced by other sectors) and institutions. Only physical resources are mentioned in this section.

Indicator 1.1.1: Capital replacement



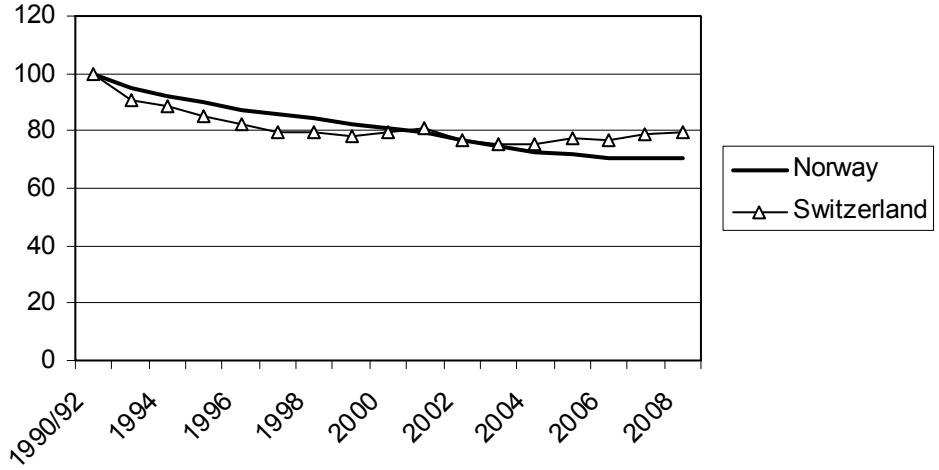
Source: Swiss Statistics, BFJ

Figure 3.1. Number of years it takes to completely replace the stock of capital for which depreciation is calculated (Average 1990/92 – 2008)

The indicator "capital replacement" is defined as the capital stock divided by the gross investments in a given year. The capital stock is restricted to capital for which depreciation is calculated. This refers to buildings and machinery. The indicator tells how many years it would take from a given year onwards to totally replace the starting year's capital stock if the starting year's gross investments were prolonged into the future. The indicator is meant to shed light on agriculture's access to capital and its ability to replace its capital stock. The indicator does not tell how the capital stock develops as such.

Figure 3.1 shows that it takes shorter time to replace the capital stock in Norway compared to Switzerland. The number of years is quite stable in Switzerland, where it takes about 30-35 years to replace the capital stock. In Norway, the values differ between around 20 years in 1993 and 12 years in 2007 and 2008. Some of the difference may be explained by different national accounting practices as the data were taken from national sources. The low number of years to replace the capital stock in Norway indicates a process of building up the capital stock.

Indicator 1.1.2: Capital stock

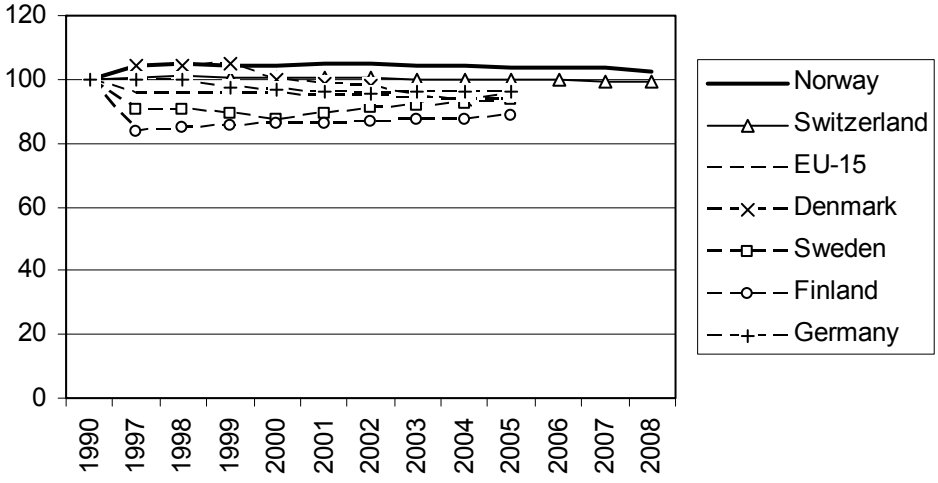


Source: Swiss Statistics, BFJ

Figure 3.2 Stock of capital for which depreciation is calculated (Average 1990/92 – 2008, Average 1990-92 = 100, 1990-prices)

Figure 3.2 shows the capital stock, where capital again is composed of buildings and machinery. The capital stock is shown relative to the situation in 1990/92 and calculated in constant 1990-prices using the consumer price index for the respective countries. The development of the capital stock is quite similar in Switzerland and Norway. There is a decrease in the 1990s that goes somewhat faster in Switzerland in the first half of the 1990s. Since around 2000, the capital stock seems to have stabilized at around 80 percent of its value in 1990/92. The indictor does not support the picture of an increasingly capital-intensive agriculture. Rather is seems that capital intensity has fallen in the period.

Indicator 1.1.3: Agricultural area (Stock)



Source: Swiss Statistics, BFJ, CAPRI

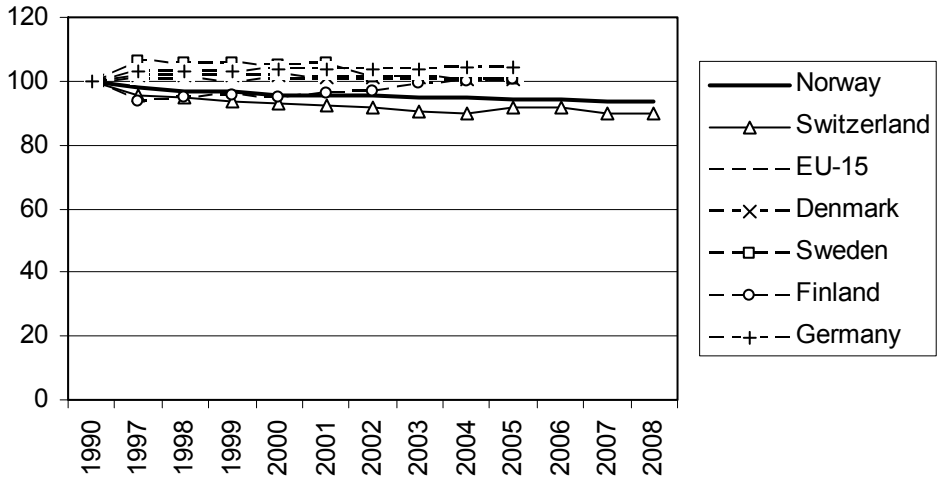
Figure 3.3 Agricultural area (1990, 1997 – 2008, 1990 = 100)

Figure 3.3 shows the development of agricultural area in Switzerland, Norway, the EU-15 and selected EU member states relative to the situation in 1990. The countries' total agricultural area remains quite stable during the period with the exception for Sweden and Finland. For

those countries, there is a quite considerable reduction from 1990 to 1997 (with no observations between these two years). After 1997, total agricultural area remains quite stable. One explanation could be that EU-membership in 1994 changed the measurement of agricultural area. But it can, of course, also be the case that agricultural area went out of production as a result of accession to the EU.

Although the data suggest relative stability, there is a slight reduction in the data for Switzerland and Norway. More agricultural land is devoted to other purposes (e.g., housing, infrastructure) than is developed by afforestation or draining of moors.

Indicator 1.1.4: Share of arable land

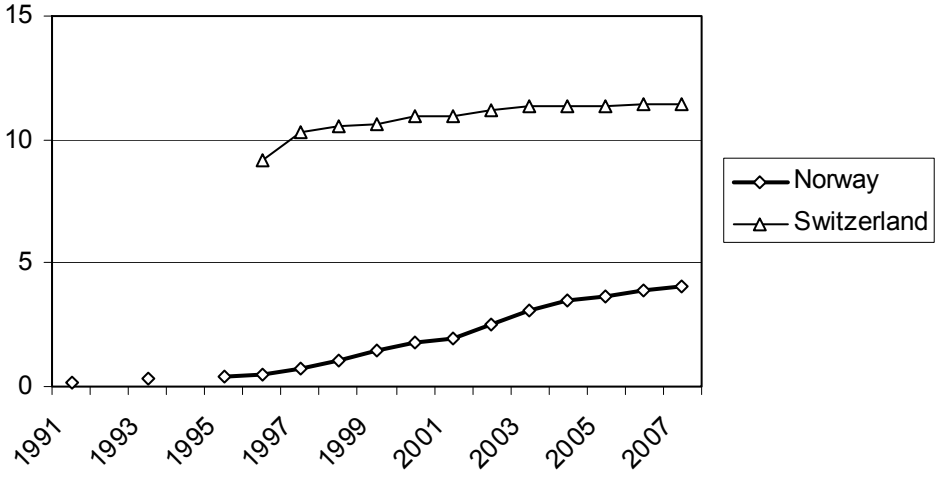


Source: Swiss Statistics, BFJ, CAPRI

Figure 3.4 Share of arable land (1990, 1997 – 2008, 1990 = 100)

The share of arable land is shown in figure 3.4. For Norway and Switzerland, there is a slight decrease in the share of arable land between 1990 and 2008. The changes are less pronounced for the selected EU member states and the EU-14 as a whole. In Germany, the share of arable land is in fact slightly increasing. Regarding Norway and Switzerland a possible explanation could be that the transformation of agricultural land into non-agricultural land for infrastructure, housing or industry purposes hits arable land to a larger extent than non-arable land, because it is more exposed to towns. A specific reason for Norway could be changes in the way non-arable land is counted in the official statistics. Similar changes may, of course, also have occurred in Switzerland and the EU.

Indicator 1.2.2: Share of agricultural land eligible for organic payments

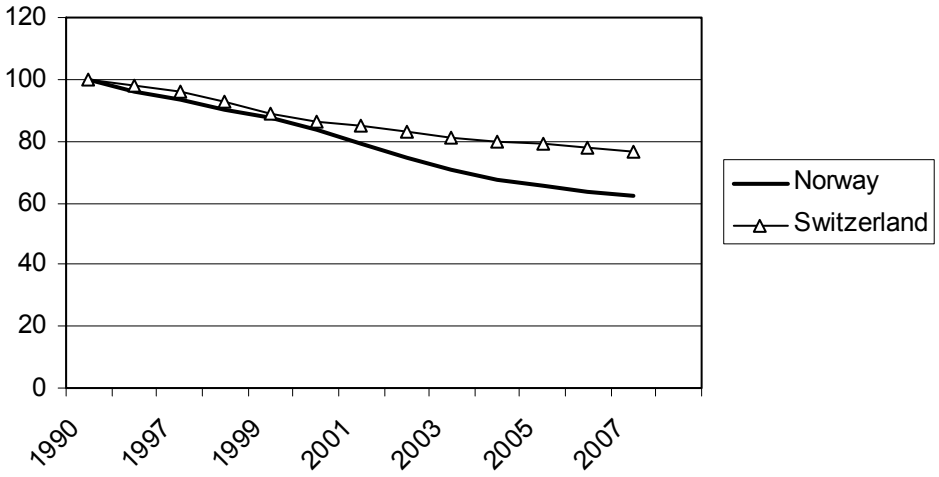


Source: Swiss Statistics, BFJ

Figure 3.5 Share of agricultural land eligible for organic payments (1991 – 2007)

The share of agricultural land that is eligible for organic payments is twice as high in Switzerland compared to Norway (figure 3.5). In Switzerland, the area for organic products is quite stable at 11-12 percent since 2000. In Norway, the percentage share has been increasing in the same period, but seems to have been flattening the last three years. The share of agricultural land eligible for organic payments is still below five percent.

Indicator 3.1.2: Number of farms



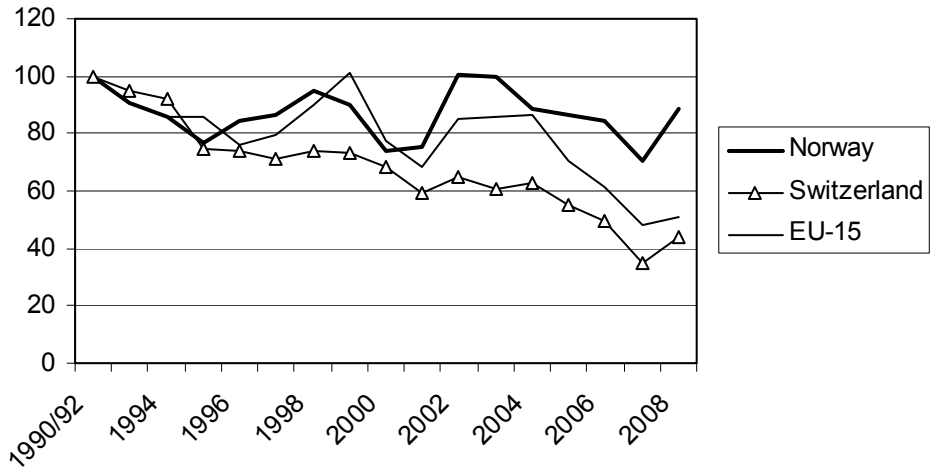
Source: Swiss Statistics, BFJ

Figure 3.6 Number of farms in Norway and Switzerland (1990, 1996 – 2007, 1999 = 100)

The number of farms is decreasing in both Norway and Switzerland (figure 3.6). The pace of change is, however, faster in Norway compared to Switzerland. Until 2000, the pace was somewhat similar, but since 2000 the decrease in the number of farms seems to have accelerated in Norway and slowed down in Switzerland. Around 40 percent of all Norwegian farms that existed in 1990 disappeared until 2007. The corresponding number for Switzerland is a little more than 20 percent.

3.2 Indicators regarding efficiency (area 2)

Indicator 2.1.1: Overall competitiveness



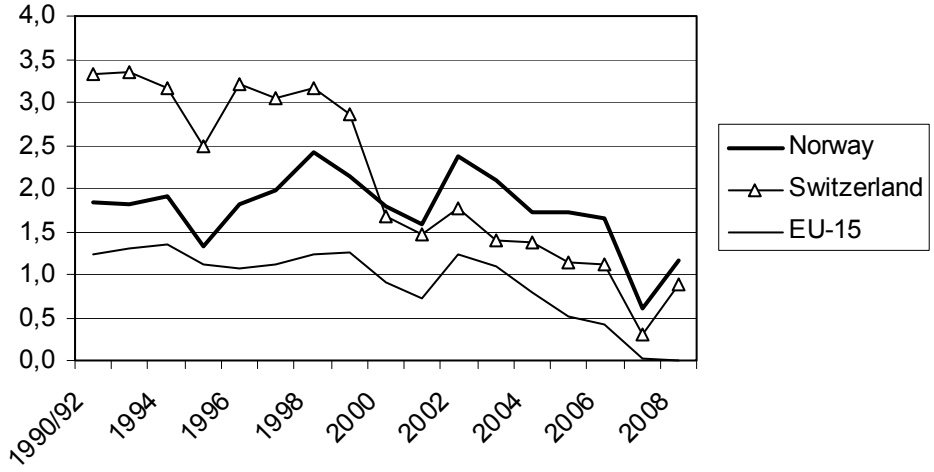
Source: OECD 2009

Figure 3.7 Relative development in Market Price Support (MPS) in Norway, Switzerland and the EU-15 (Average 1990-92 = 100, 1990/92 – 2008)

Market price support (MPS) measures the value of border protection. It is calculated for all agricultural products by multiplying domestic production with the differential between the domestic price and the observed import price at the border. MPS is an indicator for the competitiveness of domestic agriculture compared to international markets. A low level of MPS indicates a small gap between domestic and international prices. A small price gap contributes positively to competitiveness, because agriculture is seemingly in a better position to compete in international markets. The measure does not present, however, a complete picture. Direct price support, for instance, drives a wedge between domestic and international prices in a similar way but is not included in MPS, since it is financed through a country's domestic budget. Other forms of budget support may mitigate the effects of reduced MPS. In figure 3.7, MPS is calculated for Norway, Switzerland and the EU-15 in relative terms compared to the average of the years 1990-92.

Market price support (MPS) has been reduced most in Switzerland during 1990/92 and 2008. MPS in Switzerland has been more than halved during that period. In Norway, the overall reduction is about 10 percent. Two periods can be distinguished. The 1990s show a somewhat similar development where MPS was reduced with about 20-30% from the 1990/92 levels. This development is somewhat parallel in Norway and Switzerland, although more pronounced in the latter country. During the last decade (2000-2008), Norway and Switzerland go apart. While Switzerland continues the path to reduce MPS (in relative terms), Norway sees a sharp increase at the beginning of that period back to 1990/92 levels, a reduction in the following years and an increase in 2008. In summary, MPS in Switzerland has been more than halved compared to 1990/92, while the reduction in Norway is about 10% for the same period.

Indicator 2.1.2: Competitiveness for milk

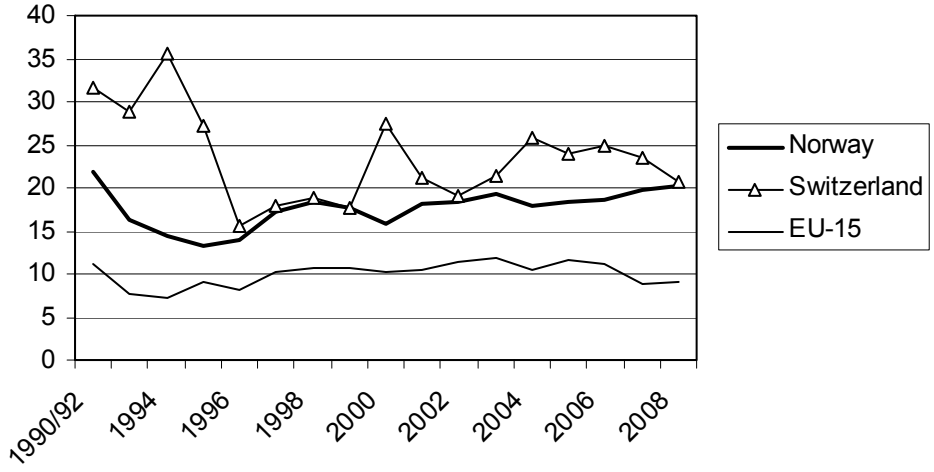


Source: OECD 2009

Figure 3.8 Market Price Support (MPS) for milk in Norway, Switzerland and the EU-15 (kr/kg, Average 1990/92 – 2008, fixed exchange rate Average 1990-92)

Figure 3.8 shows MPS for milk which is the most important product in Norwegian and Swiss agriculture in terms of value added, agricultural employment and land use. Switzerland had by far the largest price gap at the beginning of the period in absolute terms, but was in 2008 at about the same level as in Norway. Reductions in Switzerland took place mostly at the shift of the century where MPS for milk in Switzerland reached the level in Norway. Since then, milk prices in the two countries have developed about the same with a little more variation in Switzerland compared to Norway. The EU-15 MPS for milk is quite stable measured in Norwegian currency throughout the period investigated.

Indicator 2.1.3: Competitiveness for red meat



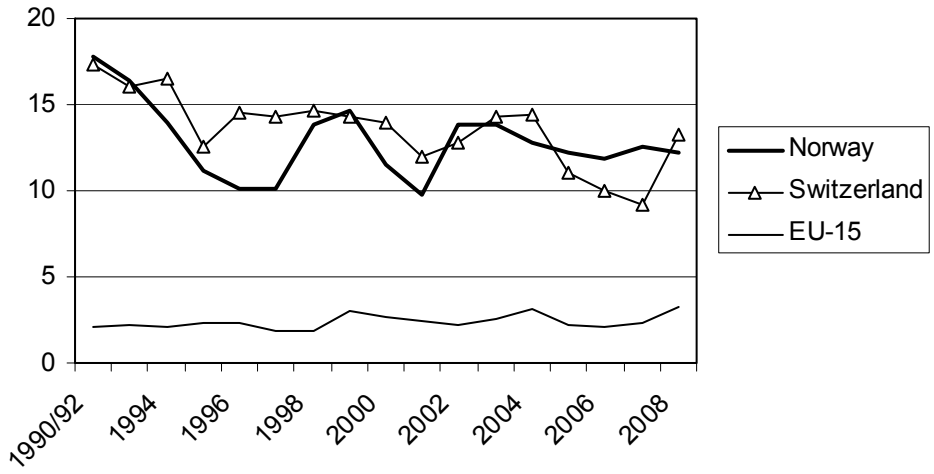
Source: OECD 2009

Figure 3.9 Market Price Support (MPS) for red meat in Norway, Switzerland and the EU-15 (kr/kg, Average 1990/92 – 2008, fixed exchange rate Average 1990-92)

The development for MPS for red meat (beef, veal and sheep) is different from the development for MPS for milk. Figure 3.9 indicates higher MPS variability in Switzerland

compared to Norway and the EU-15. This can partly be attributed to the BSE-cases that disrupted the Swiss beef market in the 1990s. In all three regions observed, MPS for red meat reveals an increasing trend. This trend is least pronounced in the EU-15, but can be clearly observed for Norway and Switzerland from about 2002 onwards. The levels in the two latter countries are higher at the end of the period than at the beginning of the period. MPS for red meat in Switzerland is higher than in Norway throughout the period, and the level is lowest in the EU-15.

Indicator 2.1.4: Competitiveness for white meat

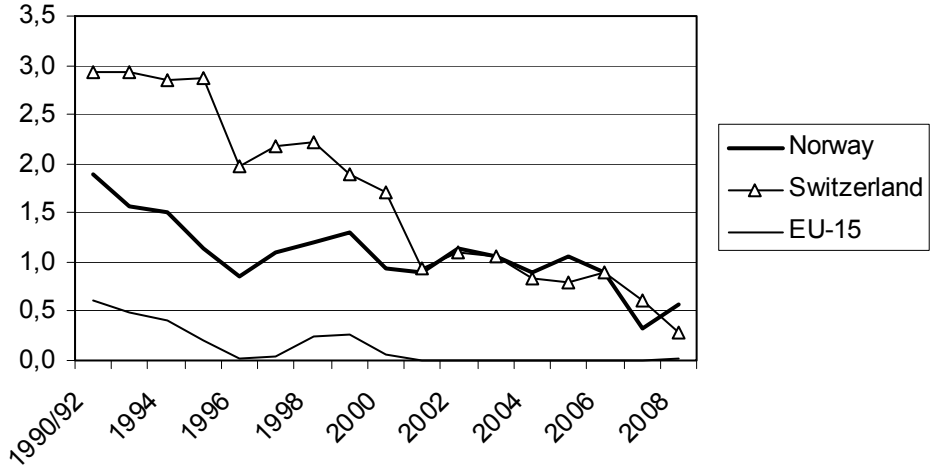


Source: OECD 2009

Figure 3.10 Market Price Support (MPS) for white meat in Norway, Switzerland and the EU-15 (kr/kg, Average 1990/92 – 2008, fixed exchange rate Average 1990-92)

The figures for white meat (pig and poultry) indicate a quite different situation between the EU-15 on the one hand and Norway and Switzerland on the other hand. It is evident that white meat production in EU-15 is by far more competitive in terms of MPS than the corresponding production in the two other regions. The price differential is more than twice as much in Norway and Switzerland compared to the EU-15. Although there has been some reduction in MPS for white meat in the beginning of the period investigated, this development seems to have stopped since the middle 1990s in both Switzerland and Norway. The development of MPS for white meat is closely related to the MPS for cereals as feed concentrates are the most important single input in the production of white meat.

Indicator 2.1.5: Competitiveness for cereals

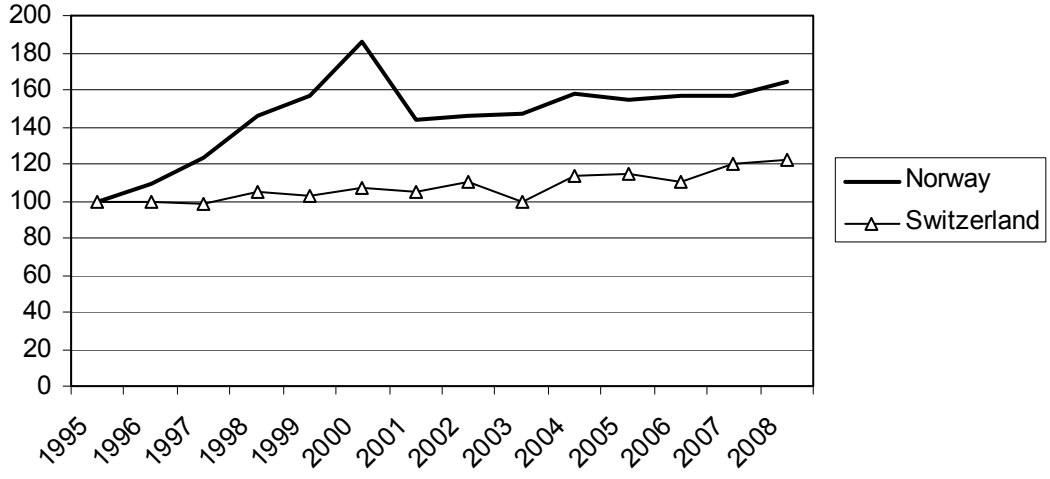


Source: OECD 2009

Figure 3.11 Market Price Support (MPS) for cereals in Norway, Switzerland and the EU-15 (kr/kg, Average 1990/92 – 2008, fixed exchange rate Average 1990-92)

The reduction of MPS for cereals has been an important element of policy reform. Being an important input in animal production, the price for cereals is usually seen as an important "cornerstone" in a country's agricultural policy. At the beginning of the period investigated, the MPS for cereals is triple as much in Switzerland compared to the EU-15 and twice as much in Norway. Since about 2000, domestic and international cereals prices are the same in the EU-15, there is no more MPS for cereals in the EU-15. Until 2000, MPS for cereals in Switzerland was considerably higher than Norway, but since 2000 the development goes much the same and MPS is the same measured in Norwegian currency.

Indicator 2.1.6: Labor productivity



Source: Swiss Statistics, BFJ

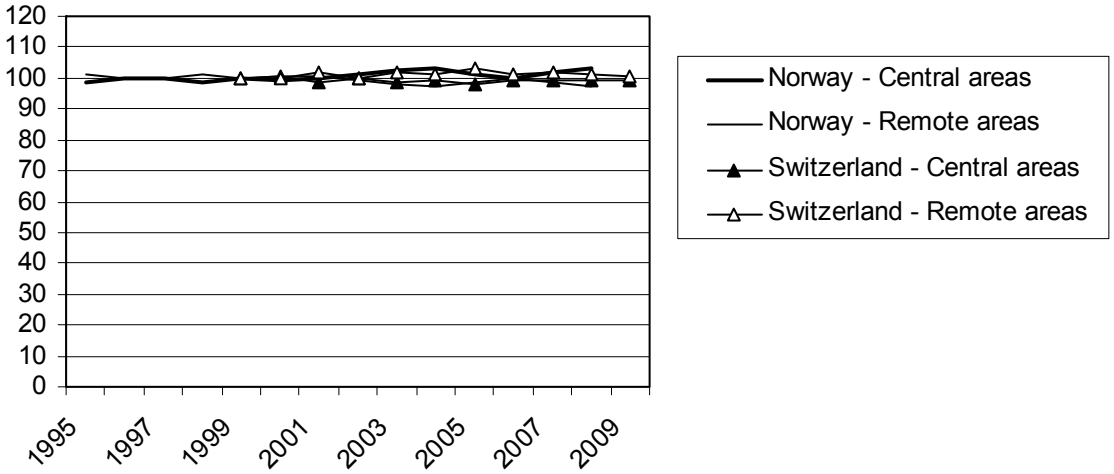
Figure 3.12 Labor productivity 1995 – 2008, 1995 = 100, 2000-prices)

Labor productivity is seen as an important indicator for economic efficiency. However, measuring labor productivity across countries is a difficult task. The data for Switzerland are taken directly from Swiss Statistics. Labor productivity is here defined as the difference

between the gross production value minus intermediate inputs (so-called Bruttoverdiskaping), measured in fixed prices, and divided by the labor force in agriculture measured in annual working units. The same methodology has been applied to calculate the corresponding figures for Norway.

3.3 Indicators regarding equity (area 3)

Indicator 3.1.3: Regional share of production value

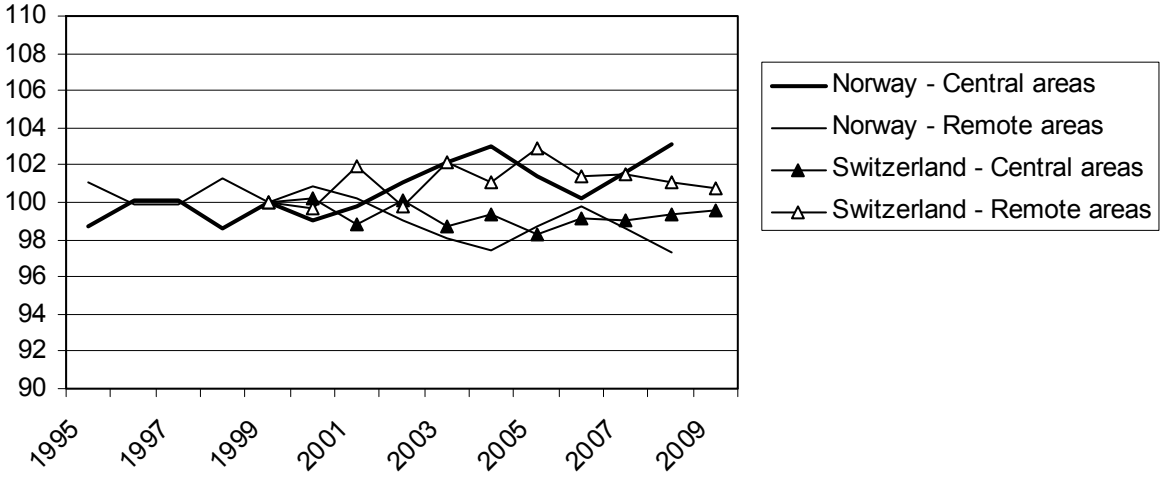


Source: Swiss Statistics, BFJ

Figure 3.13 Regional share of production value in Norway (1995 – 2008) and Switzerland (1999 – 2008, 1999 = 100)

Divided into two regions, the regional share of the production value appears to be quite stable for Norway and Switzerland. The selection of central areas in Norway is based on a classification used by the Norwegian farm account database (NILF 2009). Central areas are municipalities around the Oslofjord, Jæren and the Trondheimsfjord. These are municipalities with good agricultural conditions that allow wheat growing. As yields for cereals are only available at the county level, the production value for cereals had to be based on that level. In case of cereals, counties within central areas include Østfold, Oslo, Akershus, Hedmark, Oppland, Rogaland, Sør-Trøndelag and Nord-Trøndelag. The central areas of Switzerland are comprised of the valley region characterized by good natural conditions for agriculture.

Indicator 3.1.3: Regional share of production value (zoomed in)

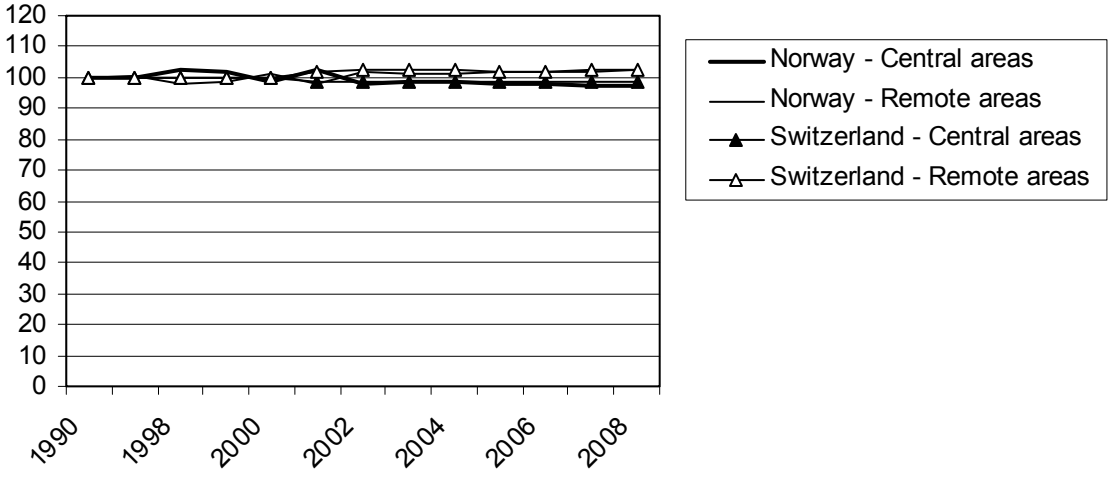


Source: Swiss Statistics, BFJ

Figure 3.14 Regional share of production value in Norway (1995 – 2008) and Switzerland (1999 – 2008, 1999 = 100)

Looking at a larger scale, some changes can be detected. Figure 3.14 indicates that central areas in Norway seem to increase their part of the overall production value, while there is a tendency that remote areas in Switzerland gain a larger part of the production value. As product prices can fluctuate within the period of observation, changes in the regional share of the production value may be contributed to a change in production prices. In addition, the choice of only two regions potentially influences the result. Splitting up Norway and Switzerland in more regions could lead to results indicating larger regional changes as those changes now may be hidden within one of the two regions.

Indicator 3.1.4: Regional share of total agricultural area

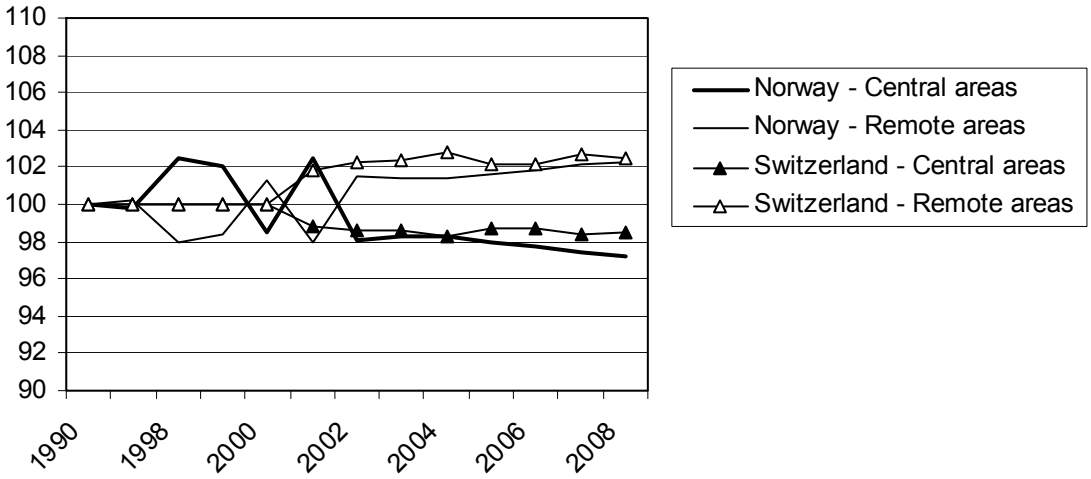


Source: Swiss Statistics, BFJ

Figure 3.15 Regional share of total agricultural area (1990 – 2009, 1990 = 100)

A similar development can be inferred for the regional share of total agricultural area. The changes seem to be quite small.

Indicator 3.1.4: Regional share of total agricultural area (zoomed in)

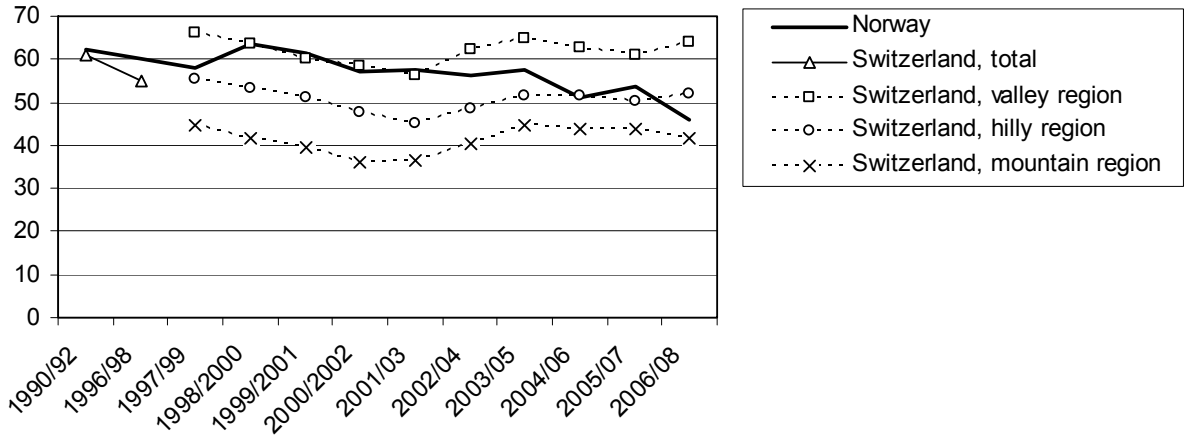


Source: Swiss Statistics, BFJ

Figure 3.16 Regional share of total agricultural area (1990 – 2009, 1990 = 100)

Looking at a larger scale, it becomes evident that the share of total agricultural areas is increasing in remote areas to the expense of central areas in both Norway and Switzerland. A possible explanation may be that agricultural area in central areas to a greater extent than in remote areas is subject to transformation into non-agricultural purposes. Thus, it may be that the absolute amount of agricultural area is decreasing in central areas, while it remains more constant in remote areas.

Indicator 3.3.1: Income comparison with off-farm income



Source: Swiss Statistics, BFJ

Figure 3.17 Agricultural income as a percentage of comparable income (Average 1990/92 – 2008, Average 1990-92 = 100, 1990-prices)

Comparing agricultural income to the income of other self-employed and wage earners is also a tricky task, especially when comparing different countries. The Swiss data are reported directly from their source of publication which is the annual report on the situation of Swiss agriculture (ref.). For both Switzerland and Norway, comparable income is defined as the annual income of an industrial worker. For the period 1990/92 until 1996/98, the data are available at the national level, while data since 1997/99 are presented for three different Swiss regions: the valley region, the hilly region and the mountain region. It appears that

agricultural income is highest compared to non-agricultural income in the valley region. This region has good agricultural conditions, and is characterized by big towns with good job market opportunities. Agricultural income lags more behind the comparable income in the two other regions. During the observation period, agricultural income as a percentage of comparable income both decreases and increases. The long run trend seems, however, to indicate a widening of the gap between agricultural income and comparable income. This gap is more pronounced in Norway. In addition, there are only three single years where agricultural income has increased more than comparable income thus reducing the income gap.

4 Discussion

The comparison of indicators for the performance of the agricultural sectors in Norway and Switzerland presents a first step towards a more comprehensive analysis of the development of these two sectors in the last decades. It highlights at least two important questions related to such work:

1. To which extent are quantitative indicators able to capture relevant trends and developments in a reasonable way?
2. Do the data used in the analysis allow cross country comparison?

Given positive answers to the two questions above, the comparison shows differences in the performance of the agricultural sectors in Norway and Switzerland. Most pronounced is the relative reduction in producer prices in Switzerland compared to relative stability in Norway. There is a higher rate of structural change (measured by the number of farms) in Norway compared to Switzerland, which seems to be consistent with the higher labor productivity in Norway relative to Switzerland. The development of agricultural area shows less pronounced differences between the two countries, while the capital stock seems to decrease more in Norway than in Switzerland.

No efforts have been made to elaborate on the causes of the differences in the observed development. Agricultural policies are, of course, a potential candidate for those causes as both Switzerland and Norway are characterized by a high degree of governmental intervention in the agricultural sector. General economic, social and cultural characteristics and trends may also be potentially important explanatory variables. The research presented in this paper may be a first contribution towards this direction.

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