IMPORTANCE OF CAP REFORMS FOR THE DUTCH AGRICULTURAL SECTOR IN 2000-2020

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Abstract

Since 2000, the two important reforms of The EU Common Agricultural Policy (CAP) took place. The Agenda 2000 Berlin Agreement of March 1999 aimed to increase EU agriculture market orientation and focuses on the grain, oilseed, dairy and the beef sectors. It reduced intervention prices in these sectors and lowered the set-aside requirements for crops and by implementation of non-crop specific compensatory payments.

The core of The Luxembourg Agreement from June 2003 was an acceleration of decoupling of farm support initiated by the Agenda 2000 complementary payment. It introduces a system of direct payments (known as single payment scheme - SPS), which are no longer linked to the production (decoupling). This CAP reform also includes commodity-specific measures, especially in dairy sector. The Luxemburg Agreement links the direct payments to farmers with farm management practices which maintain environmental and other requirements set at EU and national levels ('Cross-compliance').

The goal of this paper is twofold. First, we investigate the impact of the CAP reform on the Dutch agricultural sector in 2004 – 2007; second we examine effects of possible future CAP reform decision on the Dutch agriculture till 2020.

The study is based on the AGMEMOD econometric model developed within the framework of projects financed by the European Commission. It reflects a sectoral, dynamic, partial equilibrium model, which takes into account the national specificities and is built up of models for the Member States of the EU27. The foundation for AGMEMOD is laid in the establishment of country model templates, which must achieve compatibility of the models to be built and the communality of data. The most important differences between the national models are macroeconomic assumptions, components of policies under the CAP and SAPS (in respect with the new Member States) and assumptions on the impact of direct payments on agricultural production (degree of decoupling). On the country level, commodity templates must encapsulate the modeling system to be used. Many components of these templates are based on the information and guidelines delivered by Hanrahan (2001), but then adapted to country-specific conditions. At least, they must contain issues on market and policy description, flow charts, key market and specification of the functional forms of the commodity model. The AGMEMOD model covers all important CAP commodities: grains, oilseeds, potatoes, sugar and sugar beets, livestock products, milk and dairy products.

We will investigate the CAP impact on the Dutch agriculture by mean of policy simulations with the Dutch AGMEMOD model. To isolate policy effect in the historical period 2000 - 2007, counterfactual simulations for 2000 - 2007 will be run.

To simulate the response of the Dutch agriculture on different policy changes in 2008 - 2020, the no-policy change baseline scenario will be developed and several policy experiments will be conducted: milk quota abolition, biofuel directive implementation and animal premiums decoupling. To indentify the policy effects the policy scenarios will be compared with the baseline.

Keywords: CAP, CAP Reform, Dutch agriculture
JEL Code: Q10, Q18

Introduction

Since 2000, two important reforms of the EU Common Agricultural Policy (CAP) have taken place. First, the Agenda 2000 Berlin Agreement of March 1999 was introduced. This agreement was aimed to increase the EU agriculture market orientation and its main focus was on the grain, oilseed, dairy and beef sectors. It reduced the intervention prices in these sectors, lowered the set-aside requirements for crops and introduced non-crop specific compensatory payments.

Second, the Luxembourg Agreement has been introduced in June 2003 (Fischler Reform), at which the main core was an acceleration of the decoupling of farm support already initiated by the Agenda 2000 compensatory payments. This Agreement introduced a system of direct payments (known as 'single payment scheme' - SPS), which would no longer be linked to production levels ('decoupling' of payments). This CAP reform also included commodity-specific measures, especially in the dairy sector. The Luxemburg Agreement would link direct payments to farmers with farm management practices which maintain environmental and other requirements set at EU and national levels ('Cross-compliance').

The goal of this paper is twofold. First, we investigate the impact of the CAP reform on the Dutch agricultural sector in the period 2000–2006. Second, we examine the effects of possible future CAP reform decisions on the Dutch agriculture up to 2020.

The study is based on AGMEMOD, which is an econometric model developed within the framework of projects financed by the European Commission. It is a sectoral, dynamic, partial equilibrium model, which takes into account national specifics and is built up with models for the EU27 Member States.

We will investigate the CAP impacts on the Dutch agriculture by means of policy simulations conducted with the Dutch component of the AGMEMOD model. To isolate the policy effects in the historical period 2000-2005, counterfactual simulations for this period will be run. To simulate the response of the Dutch agriculture on different policy changes in the period 2006-2020, a 'no-policy change' baseline scenario will be developed and then policy experiments will be conducted such as the abolition of milk quota, the implementation of the regional payments and some budget cuts. To identify the policy effects, the policy scenarios will be compared with the 'no-policy change' baseline.

This paper is organized as follows. Section 2 provides an overview of the CAP reforms after 2000 and their implementations in the Dutch agricultural sector. Section 3 summarizes the AGMEMOD model, which serves as starting point of the analyses. In Section 4, we describe the policy variables implementation in AGMEMOD. The results of the experiments conducted in this study are available in Section 5, while the conclusions can be found in the last section.

Implementation of CAP reforms in the Netherlands

AGENDA 2000

The Agenda 2000 reforms concerns six areas of agricultural policy: four farming sectors (arable crop sector, beef and veal sector, milk and dairy sector and wine), rural development and horizontal measures. Concerning the four farming sectors, the Agenda 2000 continues the 1992 MacSharry reforms by replacing price support with direct payments. It reduces the intervention prices by 15% for cereals, butter and skimmed milk and by 20% for beef and veal. The reduction was phased over 2-3 years to give farmers some time to modify their production decisions and it was partially offset by higher or newly introduced direct payments. For cereals and oilseeds, it introduces the uniform intervention prices and uniform per hectare payments calculated by multiplication of historic reference yields with fixed aid per tonne. This resulted in a reduction of per hectare payments for oilseeds, while it sets up the identical policy framework for both cereals and oilseeds. In this way the partially decoupled payments were introduced.

The product related implementation of the Agenda 2000 reforms for the Netherlands can be summarized as follows.

Cereals:

- 15% price decrease: - 7.5% in 2000; -15% in 2001 (from 119.19 €/t in 1999/2000 to 101.31 €/t in 2001/02);
- compensation increase in two equal steps: from 54.34 €/t to 58.67 €/t in 2000/01 and to 63 €/t in 2001/02;
- reduction of area set-aside: compulsory set-aside from 15% to 10%, extraordinary set-aside abolished, voluntary set-aside maintained.

Oilseeds:

- a decrease of compensation payments (same payments as for cereals) in three steps, with a reduction from 94.24 €/t (cereal equivalent) to 63 €/t in 2002/03.

Milk:

- 15% intervention price decrease: -5% in 2005; -10% in 2006 and -15% in 2007;
- Compensation for the milk price decrease: the introduction of a direct payment per tonne of individual reference quantity linked to the global volume of the quota year 1999/2000, which has been set in three steps starting in 2005/06, and amounting to 17.24 €/t from 2007/08 onwards;
- 1.5% linear increase of milk quota: in 3 years from 2005 onwards (0.5% a year).

Beef:

- 20% decrease of market support price: -6.7% in 2000; -13.3% in 2001; -20% in 2002;
- increase of headage premiums for bulls, steers, and suckler cows;
- introduction of new slaughter premiums for adult bovines and calves.

Potato starch:

- 15% cut of the minimum price: -7.5% in 2000/01 and -15% in 2001/02;
- compensation payment increase in two equal steps: from 86.9 €/t in 1999/2000 to 98.7 €/t in 2000/01 and 11.5 €/t in 2001/02;
- reduction of starch potato quota by 1.41% in 2000/01 and 2.87% in 2001/02.

Fischler reform/Luxembourg Agreement

The main goal of the Luxembourg Agreement from June 2003 was a further acceleration of the decoupling of the farm support as had been initiated by the complementary payments of Agenda 2000. The Luxembourg Agreement introduced a Single Payment Scheme (SPS), in which payments are no longer coupled to production. This CAP reform also includes commodity-specific measures (especially in the dairy sector) and allows on limited coupling of payments for certain commodities to maintain a selected production types and to avoid land abandonment.

Member states could follow two ways to introduce the SPS schema: based on historical payments or based on regional payments. In case of historical payments, farmers receive an aid which is based on individual payments they received in the reference period 2000-2002. Regional payments are based on the average level of payments received by the farmers in a region during the reference period. In case of historical payments, farmers who did not receive direct payments in the reference period are not eligible for SPS entitlements. However, in most countries entitlements are tradable. The Dutch choice was to introduce the SPS based on historical payments in 2006. In addition, instead of full decoupled payments, the Netherlands went for partly coupled starch potatoes payments (60%) and fully coupled dried feed crops and flaxseed payments and slaughter premiums. As a result, about 70% of Dutch farmers received the SPS in 2006[1] . Those that didn't receive SPS were mainly in sectors such as horticulture and intensive animal husbandry separated from feed production (mainly pigs and poultry).

The Luxemburg Agreement left the intervention prices unchanged with exception of the butter intervention price, which was cut additionally by 10% in comparison with Agenda 2000.

[1] The implementation vision of Common Agricultural Policy: CAP in 27 EU Member States: http://www.rlg.nl/cap/

The AGMEMOD model

AGMEMOD is an econometric, dynamic, multi-product partial equilibrium model which is built up as a system that integrates 25 EU Member State models[2] and the World-level variables. Based on a common country model template, country level models with country specific characteristics has been developed to reflect the specific situation of their agriculture (Chantreuil, Levert and Hanrahan (2005), Erjavec and Donnellan, (2005) and to be subsequently combined in a composite EU AGMEMOD model. Many components of these templates are based on the information and common guidelines delivered by Hanrahan (2001) and Riordan et al. (2002), but then adapted to country-specific conditions. This approach captures the inherent heterogeneity of the agricultural systems existing across the EU while still maintaining analytical consistency across the country models via as close as possible adherence to template. The maintenance of analytical consistency across the country models is essential for the aggregation and also facilitates the comparison of the impact of a policy across different member states.

Each country level model is built up as a system of mutually related commodity markets models. The EU model distinguishes 34 primary and processed agricultural commodities[3] , although not all commodities have been introduced in each country model. The ruling conditions to incorporate commodities for the individual country are that they should either be influenced by CAP, or they should be of major importance for a country agricultural production. Any commodity model includes behavioural equations and identities explaining production supply, demand creation and price formation. The supply and demand side for all commodities have been modelled using behavioural equations based on the microeconomic theory of consumer and producer behaviour. To represent rigidity in the adjustment of agricultural production levels and consumption patterns, previous production or stock levels are used in order to explain production development, while previous consumption levels are used to explain consumption growth. This introduces the dynamics into the model. Also, time trends are used as a proxy for technological change, while dummy variables are used to represent a special policy regulation (e.g. a quota period) or extraordinary events such as very bad weather and periods of animal health crises. Besides of the variables mentioned above, the agricultural production and consumption is influenced by agricultural policy variables.

Commodity markets are mutually linked via technological relations on the production side and via complementarity/substitutability relations on the consumption side. To assure common trend in agricultural price developments for all EU counties, the agricultural prices are not determined as market-clearing prices but they are linked to the EU prices via price transmission equations. Therefore, for each commodity market there is one endogenous

[2] Malta and Cyprus are not included.

[3] AGMEMOD includes the following commodities: common wheat, durum wheat, barley, maize, rye, oats, triticale, rice, soybean, rape seed, sunflower seed, vegetable oils and meals, potatoes, sugar, milk, butter, cheese, skimmed milk powder, whole milk powder, casein, drinking milk, eggs, beef and veal, pork, poultry, sheep and goat, wine, cotton, tobacco, olive oil, apples, citrus fruits and tomatoes.

variable, generally the export or import variable, which is determined through a supply and demand identity and which closes the commodity market balance. At the EU-level, the EU net export variable is used as the closure variable.

The EU price (the so called 'key price' in AGMEMOD language) is mostly defined as the price of the most important national market for that commodity in the EU. The EU key price formation equation is the only behavioural equation of the EU model. It explains the EU key price formation as a function of the world price, the intervention price level, the EU market equilibrium condition for the commodity in consideration - described by the EU level self-sufficiency rate - and EU trade policy variables. The self-sufficiency ratios in the EU key price equations, in combination with the country specific price transmission equations, ensure a mutual link between all national models. The remaining EU model equations consist of accounting identities, summing the demand and supply variables of all individual country models up to EU level balances and self-sufficiency ratios.

The policy variables

Among other variables, the agricultural policy variables influence the agricultural production and consumption levels in AGMEMOD. There are five types of policy variables, which influence both crop and animal production:

- production quota and payment rights quota;
- direct (headage or area) payments;
- decoupled payments;
- intervention prices;
- budget available for the direct support measures.

The production quota and payment rights quota influence the production levels through stock equations in the animal sector model and through harvested area equations in the crop sector model. The direct payments increase the returns from production and accordingly influence the production levels. It is assumed that the decoupled payments increase the returns from production as well. However, their influence on the production level would be lower than the influence of coupled payments, because producers now receive decoupled payments even without producing agricultural commodities. The level of the decoupled payments is affected by the budget available. Finally, the intervention prices influence the EU key prices and enter the stock level equations of the commodities in the country models.

Two crop sector specific variables, cereal set-aside rates and reference yields, also influence the crop production. The cereal set-aside decreases the crop area, while the reference yield is used to calculate direct payments per hectare and would influence the production return and level. For the animal sector, the butter for direct consumption subsidy

and skimmed milk powder (SMP) for animal feed subsidy would affect the butter consumption demand and the SMP feed use respectively.

In AGMEMOD, the importance of policy variables on the development of agricultural production depends on the parameter values for these variables in the model equations. In respect to the "old" CAP, these parameters were estimated econometrically or calibrated using the historical data up to 2004. In respect with the Dutch AGMEMOD model, the estimation procedure was mainly used to set up model parameters. However, when an estimated parameter in a particular equation had a wrong sign or a wrong magnitude, the parameter value had been set (or calibrated) based on expert's knowledge and literature, while the remaining parameters in that particular equation were estimated. The economic plausibility of the estimated equations are regarded as superior to statistical tests and this could result to the adjustment of particular model specifications (although these could be statistically correct).

To model the impact of the Fischler Reform on the agricultural production, it has been assumed that decoupled payments have supply inducing effects. This effect is considered to be similar to old coupled headage or area payments. However, the decoupled payments are considered to have in general a lower impact on the production than the old (coupled) payments. This has been implemented by replacing the coupled payments by the decoupled payments in the model equations from 2006 onwards. Simultaneously, the estimated/calibrated equation parameters concerning production related payments have been reduced by applying commodity specific impact multipliers from 2006 onwards. These multipliers range from 0 to 1 and show the relative reduction of the decoupled payments impact on the production compared with the coupled payments. The multiplier levels were calibrated to reproduce as well as possible the observed data for production in the year 2006.

For the Netherlands, table 1 presents the multipliers calculated for the specific agricultural commodities. The calculated multiplier values show that the decoupled payments for crops have much higher supply inducing effects than those for animal commodities. Moreover, it seems that the supply inducing effect of decoupled payments for crops is more or less equal to the impact of the previous coupled payment, i.e., the decoupled payments for grains only have a 28% lower impact on production than the coupled payments had.

Table 1 - Commodity specific multipliers

Agricultural commodity	**Multiplier**
Grains	0.72
Oilseeds	1.00
Starch potatoes	1.00
Beef and veal commodities	0.20
Sheep and goats commodities	0.20
Milk	0.25

However, the calibrated multipliers can be biased as they have been calculated based on only one observed year. This year is the first year of implementing the Fischler Reform in the Netherlands, which could be far away from the 'real' equilibrium situation. Especially the multipliers for milk and beef and veal commodities might be downward biased. This is not only due to the presence of the quota regime in the milk sector, but also due to the relatively high beef prices in 2006.

The calculation of decoupled payments has been described in Salputra and Miglavs (2007). In general, decoupled payments have been calculated as per hectare payments computed by dividing the financial budget (envelope) for each country by the eligible agricultural area. In case of cattle, the per hectare payments have been recalculated into per animal payments using the historical livestock density per hectare of grassland.

In case of the historical payments – as applied in the Netherlands – it is assumed that payments are allocated to the same commodities as in the past. This leads to different per hectare payments for eligible arable land (excluding potatoes), potato and grassland. Here, the eligible area only includes arable land or grassland related to crop and cattle payments in the historical period (2000-2002). On the other hand, the regional payments are uniform per hectare payments calculated for all useable agricultural area.

Impact of CAP reforms on the Dutch agriculture: policy experiments

To assess the importance of the two CAP reforms on the Dutch agricultural sector in the period 2000–2020, the following policy experiments have been conducted:

- *AGENDA 2000 counterfactual policy experiment for the period 2000-2005* in order to analyze the impact of the AGENDA 2000. Here, "No-AGENDA 2000" and "AGENDA 2000" simulations are run and their results are compared. Compared with the "AGENDA 2000" experiment, the "No-AGENDA 2000" experiment assumes that the 1999 values of policy variables will also be valid for the period 2000-2005.
- *Fischler Reform policy experiment for the period 2006-2020* in order to asses the impact of the Fischler Reform. Two simulation experiments are run here and their results are compared: the continuation of AGENDA 2000 policy (NoFR scenario) and the Fischler Reform simulations (FR scenario).
- *Future CAP reform simulations for the period 2009-2020* in order to examine effects of the possible future CAP reform decisions (additionally to Fischler Reform). The following scenarios are investigated here:
    - milk quota abolition scenario (Milk scenario) assuming expansion of the milk quota by 1% per year from 2009/10 to 2013/14, quota removal in 2015 and intervention price of butter and SMP cut by -2% per year starting in 2009;
    - switch to regional SPS scenario (Reg scenario) assuming: the same payment entitlement per eligible hectare of agricultural land and no coupled measures at;

- switch to regional scheme with linear reduction of payments to 0 (Reg0 scenario): as Reg scenario but with reduction of budget by 25% in 2009, 50% in 2010, and 100% in 2011.

The results of these reforms will be compared with the Fischler Reform simulation result (FR Scenario).

All other assumptions than the policy exogenous variables – mostly macroeconomic variables concerning GDP population, inflation and world price developments - are kept the same in all simulations.

Agenda 2000 effect on the Dutch agricultural sector

This section presents the effect of the AGENDA 2000 implementation on prices, production and consumption of the agricultural commodities in the period 2000-2005. In tables 2, 3 and 4, the AGENDA 2000 effects on crops are presented. The results can be summarized as follows:

- Cereal and potato prices decrease because intervention prices go down.
- Rapeseed price increases as per tonne payments for oilseeds fall in comparison with cereals payments. This results in a lower oilseeds production, which lifts the oilseeds prices.
- Cereal areas rise due to the implementation of per tonne payments. These payments have higher impacts on production than intervention prices. Especially, because the intervention prices for crops were often lower than the world prices in this period. Consequently, cereal production increases too.
- Potato area and production decrease due to a lower minimum price, whereas the starch potato quota is sufficiently compensated by higher direct payments
- Grain and potato yields go slightly down responding to lower prices, which stimulate the less intensive production.
- The opposite situation is observed for rapeseed. Lower per hectare payments lead to lower harvested area which is only slightly compensated by higher yields. This will lead to a lower rapeseed production.
- Lower cereal prices make the sugar beets production a bit more profitable in comparison with cereals. This encourages farmers to take more risk so that the production of sugar beets could grow above the quota level and this will lead to an increase of the sugar beets area and production.

Table 2 - AGENDA 2000 effect on crops as differences in comparison with the No-AGENDA 2000 scenario (%).

Price	2000	2001	2002	2003	2004	2005	average
Wheat	-4.06	-6.29	-6.10	-6.49	-6.36	-5.96	-5.88
Barley	-3.73	-6.89	-6.24	-5.98	-6.47	-6.86	-6.03
Maize	-1.70	-3.22	-3.00	-3.21	-3.33	-4.01	-3.08
Rapeseed	0.81	0.45	2.17	2.66	0.74	3.57	1.73
Potatoes	-0.96	-2.93	-3.32	-2.17	-1.98	-2.87	-2.37
sugar beets	0.00	-0.00	0.02	0.02	0.02	0.03	0.02
Harvested ha	2000	2001	2002	2003	2004	2005	average
Wheat	0.91	1.00	0.44	0.31	0.18	0.86	0.62
Barley	0.91	1.89	1.90	1.53	1.41	1.25	1.48
Maize	0.91	2.86	4.43	5.60	6.41	6.83	4.50
Rapeseed	-10.45	-18.47	-24.38	-20.52	-10.47	-11.23	-15.92
Potatoes	-0.10	-0.19	-0.13	-0.14	-0.14	-0.33	-0.17
sugar beets	0.00	0.19	0.35	0.43	0.50	0.54	0.34
Yield/hectare	2000	2001	2002	2003	2004	2005	average
Wheat	0.05	-0.03	-0.18	-0.30	-0.41	-0.47	-0.22
Barley	-0.10	-0.31	-0.31	-0.31	-0.35	-0.39	-0.29
Maize	0.00	-0.02	-0.05	-0.09	-0.12	-0.15	-0.07
Rapeseed	0.08	0.15	0.17	0.25	0.20	0.30	0.19
Potatoes	0.00	0.00	-0.01	-0.02	-0.03	-0.04	-0.02
sugar beets	0.00	0.00	-0.07	-0.14	-0.16	-0.18	-0.09
Production	2000	2001	2002	2003	2004	2005	average
Wheat	0.96	0.98	0.26	0.01	-0.23	0.39	0.39
Barley	0.81	1.58	1.59	1.21	1.05	0.86	1.18
Maize	0.91	2.84	4.37	5.51	6.28	6.66	4.43
Rapeseed	-10.37	-18.35	-24.25	-20.33	-10.29	-10.97	-15.76
Potatoes	-0.10	-0.19	-0.13	-0.16	-0.17	-0.37	-0.19

- Similarly to the crop sector, lower intervention prices results in lower beef and milk prices. However, lower grain prices cause the feed prices to decrease, which leads to more pork, poultry and eggs production and – accordingly – a price decrease for these commodities.

- The pig and pork production increase is limited by manure policy (quota). The beef and veal related payments positively affect suckler cows and calves and result in a higher cattle herd. Hence, the veal production will rise in cost of lower beef production. However, as the calves slaughter weight is much lower than the weight of heifers and bulls, the average cattle slaughter weight will decrease. Accordingly the veal and beef meat production will fall.
- A lower milk price does not impact the milk production very much at the presence of milk quota, high quota rent in the Netherlands and falling feed prices. The increase of the milk quota rent in 2004/05 causes (together with lower milk production cost) an increase of the milk cows herd and the milk production after 2004/05.
- The intervention price decrease has the most significant impact on butter prices and this shifts the dairy production away from butter to cheese and milk powder.

Table 3 - AGENDA 2000 effect on animal products as differences in comparison with the No-AGENDA 2000 scenario (%)

Price	2000	2001	2002	2003	2004	2005	average
Beef	-0.83	-2.21	-3.17	-4.49	-4.04	-4.12	-3.14
Pork	-0.63	-0.86	-1.55	-2.09	-2.24	-1.78	-1.53
Poultry	-0.59	-0.86	-2.30	-1.20	-2.77	-1.16	-1.48
Eggs	-0.30	-0.52	-1.31	-0.57	-2.37	-0.99	-1.01
Livestock	2000	2001	2002	2003	2004	2005	average
milk cows	-0.01	-0.01	-0.01	-0.01	0.60	0.38	0.15
suckler cows	2.75	4.35	6.71	4.96	4.49	5.15	4.74
cattle total	0.99	1.76	2.26	1.59	0.97	0.48	1.34
Pigs	0.08	0.21	0.21	0.20	0.12	0.11	0.16
Sows	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Slaughter	2000	2001	2002	2003	2004	2005	average
Cows	0.79	6.37	8.41	10.90	8.47	5.66	6.77
Calves	3.25	12.06	18.35	21.22	21.83	22.20	16.49
Pigs	0.06	0.18	0.20	0.16	0.06	0.01	0.11
Slaughter weight	2000	2001	2002	2003	2004	2005	average
Cattle	-2.20	-5.32	-9.12	-11.12	-12.34	-12.93	-8.84
Pigs	0.03	0.07	0.07	0.08	0.07	0.08	0.07
Production	2000	2001	2002	2003	2004	2005	average
beef and veal	-3.84	-7.29	-10.35	-9.95	-10.91	-11.37	-8.95
Pork	0.09	0.25	0.27	0.24	0.13	0.10	0.18
Poultry	1.64	2.67	2.64	3.01	3.20	0.02	2.20
Eggs	-0.02	-0.03	-0.08	-0.06	-0.09	-0.03	-0.05

Table 4 - AGENDA 2000 effect on dairy products as differences in comparison with the No-AGENDA 2000 scenario (%)

Price	2000	2001	2002	2003	2004	2005	average
milk	-0.06	-0.17	-0.18	-0.16	-2.11	-5.31	-1.33
SMP	0.00	0.00	0.00	0.00	0.00	-3.23	-0.54
cheese	-0.08	-0.23	-0.18	-0.20	-1.28	-3.29	-0.88
butter	-0.09	-0.23	-0.28	-0.22	-3.76	-7.41	-2.00
Production	2000	2001	2002	2003	2004	2005	average
milk	-0.01	-0.01	-0.01	-0.01	0.59	0.34	0.15
SMP	0.02	0.07	0.07	0.07	1.63	1.30	0.53
cheese	-0.03	-0.06	-0.02	-0.05	1.23	1.93	0.50
butter	-0.05	-0.10	-0.14	-0.09	-2.31	-2.64	-0.89

Fischler reform and future policy reform effects on the Dutch agricultural sector

This section shows the simulated results of the Fischler Reform and its possible future impacts on the Dutch agricultural sector. Comparing the Fischler Reform (FR) scenario with the continuation of AGENDA 2000 scenario (NoFR) we can notice the following (Tables 5, 6 and 7):

- A first effect of decoupled payments is a slightly lower agricultural production in the EU, which leads to a slight increase of EU agricultural prices. There is an exception for the dairy sector, which faces a decrease of milk prices due to an additional cut of the butter intervention price in comparison with AGENDA 2000. In general, the Dutch agricultural prices and productions follow this development.
- The direct payments have strong supply inducing effects on rapeseed production in comparison with other crops in the Netherlands. As a result, the Fischler Reform leads to a strong increase of the rapeseed area and rapeseed production. Areas and production of other crops will decrease slightly. It is worth to notice that the rapeseed harvested area is a very small fraction (less than 1%) of the total cereals and oilseeds area.
- The total cattle herd is rarely affected as it strongly depends on the number of dairy cows and the fixed relation between the number of calves born per cow.

Table 5 - Fischler reform and future policy reform effects on crops: differences between scenarios (%)

	FR-NoFR			Milk-FR		Reg-FR		Reg0-FR	
					Price				
	2006	2010	2020	2010	2020	2010	2020	2010	2020
Wheat	0.3	0.1	0.0	0.0	-1.0	1.1	1.8	1.1	3.1
Barley	0.3	0.3	0.1	-0.0	-0.1	0.6	0.7	0.6	2.3
Maize	0.5	0.7	0.2	0.0	-0.1	0.6	1.3	0.6	4.8
rapeseed	-0.0	-0.1	-0.1	0.0	-0.0	-0.1	-0.1	-0.1	0.6
potatoes	0.0	0.6	1.2	0.0	0.0	-2.3	-2.8	-2.3	0.3
sugar beets	0.0	0.0	0.0	0.0	-0.0	-0.0	0.0	0.0	0.0
Sugar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					Harvested areas				
	2006	2010	2020	2010	2020	2010	2020	2010	2020
Wheat	-2.4	-0.6	-0.1	0.0	-0.4	0.5	0.7	0.5	-3.2
Barley	-2.4	-2.2	-0.5	-0.0	0.6	1.5	0.3	1.5	-8.2
Maize	-2.4	-3.8	-1.0	-0.0	0.4	1.7	2.1	1.7	-10.7
rapeseed	1.6	4.5	8.6	-0.0	0.0	4.4	3.3	4.4	-33.6
potatoes	-3.5	-3.0	-2.5	-0.0	0.0	5.2	6.1	5.2	-0.7
sugar beets	0.0	-0.0	-0.0	-0.0	0.1	0.0	-0.1	0.0	-0.2
					Yield per hectare				
	2006	2010	2020	2010	2020	2010	2020	2010	2020
Wheat	-0.1	-0.0	-0.0	0.0	-0.1	0.0	0.1	0.0	-0.0
Barley	0.2	0.2	0.0	0.0	-0.1	-0.1	-0.0	-0.1	0.7
Maize	0.0	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.1
rapeseed	-0.0	-0.0	-0.1	0.0	-0.0	-0.0	-0.0	0.0	0.2
potatoes	0.0	0.1	0.1	-0.0	0.0	-0.1	-0.1	-0.1	-0.0
sugar beets	0.0	0.0	0.0	0.0	-0.0	-0.0	0.0	0.0	0.0
					Production				
	2006	2010	2020	2010	2020	2010	2020	2010	2020
Wheat	-2.5	-0.7	-0.1	0.0	-0.5	0.6	0.8	0.6	-3.2
Barley	-2.2	-2.0	-0.5	-0.0	0.5	1.4	0.3	1.4	-7.6
Maize	-2.4	-3.8	-1.0	-0.0	0.4	1.7	2.1	1.7	-10.6
rapeseed	1.6	4.4	8.5	-0.0	0.0	4.4	3.3	4.4	-33.4
potatoes	-3.5	-2.9	-2.4	-0.0	0.0	5.2	5.9	5.2	-0.7
sugar beets	0.0	-0.0	-0.0	-0.0	0.1	0.0	-0.1	0.0	-0.2
Sugar	0.0	0.0	0.0	0.0	-0.0	-0.0	0.0	0.0	0.1

- Considering the animal production, the strongest effect of the decoupling of payments is visible for suckler cows. Its herd will decrease in comparison with the AGENDA 2000 prolongation scenario by 7.5% to 17%. Consequently, the overall veal and beef meat production will slightly decrease as a result of the Fischler Reform implementation, whereas pigs and poultry production will not be affected.
- Lower milk prices lead to a slightly lower milk production (0.3%) under the Fischler reform. However, a significant shift is observed in the dairy products production pattern: milk powder and cheese will gain (2.8% and 1.4% respectively) and butter will loose (6%).

Table 6 - Fischler reform and future policy reform effects on animal products: differences between scenarios (%)

	FR-NoFR			Milk-FR		Reg-FR		Reg0-FR	
					Price				
	2006	2010	2020	2010	2020	2010	2020	2010	2020
Beef	0.0	0.2	0.1	-4.4	-7.6	-1.6	-0.5	-1.6	-0.3
Pork	-0.0	0.0	0.0	-0.8	-1.1	-0.1	0.1	-0.1	0.2
Poultry	-0.0	0.1	0.2	-0.0	-0.1	-0.0	0.1	-0.0	0.1
Eggs	-0.0	0.1	0.2	-0.0	-0.1	-0.0	0.1	-0.0	0.1
					Livestock				
	2006	2010	2020	2010	2020	2010	2020	2010	2020
milk cows	-0.3	-0.3	-0.3	1.8	6.0	-0.0	-0.1	-0.0	-0.1
Suckler cows	-16.8	-12.5	-7.5	-3.2	-3.2	-2.7	-2.7	-2.7	-3.8
cattle total	0.1	-0.3	-0.2	0.1	2.4	-0.7	1.0	-0.7	0.1
Pigs	-0.0	-0.0	0.0	-0.0	-0.1	-0.0	-0.0	-0.0	-0.1
Sows	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					Slaughter				
	2006	2010	2020	2010	2020	2010	2020	2010	2020
Cows	-2.1	-2.0	-1.4	-0.3	4.0	-4.6	2.6	-4.6	-1.0
Calves	-0.1	-0.5	-0.4	0.9	3.8	-10.4	-14.0	-10.4	-13.8
Pigs	-0.0	-0.0	0.0	-0.1	-0.1	-0.0	-0.0	-0.0	-0.1
					Slaughter weight				
	2006	2010	2020	2010	2020	2010	2020	2010	2020
Cattle	-0.1	-0.1	-0.1	0.2	0.5	9.4	13.2	9.4	13.3
Pigs	-0.0	-0.0	-0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.0
					Production				
	2006	2010	2020	2010	2020	2010	2020	2010	2020
beef and veal	-0.4	-0.8	-0.5	0.4	3.6	8.9	11.8	8.9	12.6
Pork	-0.0	-0.0	0.0	-0.1	-0.1	-0.0	-0.1	-0.0	-0.1
Poultry	-0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0
Eggs	-0.0	0.0	0.0	-0.0	-0.0	-0.0	0.0	-0.0	-0.0

If - in addition to the Fischler Reform - the milk quota is abolished (Milk scenario), then significant changes in the dairy sector as well as in the beef and veal sector are observed. In comparison with the Fischler Reform (FR) scenario, the Milk scenario leads to the following:

- Despite of a milk price decrease (by more than 13% in 2020), which is caused by intervention price reductions, the milk quota abolition leads to an increase of the milk production (by 6% in 2020) cattle herd (2.4% in 2020) and beef and veal production (3.6% in 2020) compared to the Fischler Reform scenario.
- Lower milk prices lead to lower dairy product prices. The most significant price drop is observed for butter (19%). This results in a decrease of the butter production and an increase of the production of other dairy products.
- Higher demand for feed leads to higher coarse grains production and to lower wheat production, which in turn leads to an increase of the wheat price by 1% compared to the Fischler Reform scenario.

Table 7 - Fischler reform and future policy reform effects on dairy: differences between scenarios (%)

	FR-NoFR			Milk-FR		Reg-FR		Reg0-FR	
					Price				
	2006	2010	2020	2010	2020	2010	2020	2010	2020
milk	-5.0	-4.7	-4.3	-2.7	-13.2	0.0	-0.0	0.0	-0.0
SMP	-2.1	0.9	1.5	-0.0	-4.9	0.0	-0.1	0.0	-0.1
cheese	-0.4	-2.6	-2.4	-2.8	-9.2	0.0	-0.0	0.0	0.0
butter	-9.1	-9.0	-8.7	-4.2	-19.3	0.0	0.0	0.0	0.0
					Production				
	2006	2010	2020	2010	2020	2010	2020	2010	2020
milk	-0.4	-0.3	-0.3	1.8	5.9	-0.0	-0.1	-0.0	-0.1
SMP	1.0	2.6	2.8	3.3	11.1	-0.1	-0.1	-0.1	-0.2
cheese	3.4	1.4	1.4	1.7	9.7	-0.0	-0.0	-0.0	-0.1
butter	-6.0	-6.1	-6.0	-0.2	-3.7	-0.1	0.0	-0.1	-0.0

The implementation of regional SPS in all EU countries (Reg scenario) leads to significant changes of the Dutch arable crop and beef sectors compared to the original Firschler Reform implementation (FR scenario):

- The switch from historical to regional SPS will cause a further (to the already observed fall in the Fischler Reform scenario) decrease of the per hectare payments. In turn this will lead to a decrease of the cereal production and an increase of cereals prices in the EU. The Dutch price follows this development.

- In case of the historical SPS scheme in the Netherlands, the per hectare payments for eligible arable crops are much lower than the per hectare payments for eligible grassland. Therefore, implementations of regional flat payments lead to a slight increase of payments for arable crops and a significant decrease of payments in the beef sector. This results in an increase of the arable crop harvested areas and arable crop production in the Netherlands with exception of sugar beets. The production growth is especially high for rapeseed (more then 3% in 2020) and potatoes (more than 6%) in 2020. High rapeseed and potato productions lead to lower prices for these commodities.
- The suckler cows herd will decrease (by almost 3%) and the calves slaughter will decline (by 14%) as a result of the low beef payments and the decoupling of slaughter premiums. At the same time, the number of heifers and bulls will increase, which will lead to higher slaughter weights and higher meat production. This causes a slight decrease of the beef prices.

The implementation of regional SPS, together with a stepwise reduction of payments to zero, has the most significant impact on the arable crop sector in the Netherlands from all considered policy scenarios.

- After the disappearing of direct payments, the arable crops production will decrease gradually. In 2020 and in comparison with the Fischler Reform scenario, wheat production is 3% lower, barley production more than 8% lower, maize production almost 11% lower, rapeseed production almost 34% lower and potatoes production almost 1% lower. As a result, arable crop prices increase from 0.3% for potatoes to almost 5% for rapeseeds.
- The abolishment of direct payments has similar impacts on beef and veal production than the implementation of regional payments. There are two important reasons for this. First, the regionalization of payments already reduces payments in the beef and veal sector by almost 70%. Second, the abolishment of direct payments will lead to a higher increase of beef prices in the EU and this effect will partially offset the negative effect of the payment decreases.

Conclusions

Based on AGMEMOD, the investigated policy scenarios show that only drastic policy changes have a significant impact on the Dutch agricultural sector. The implementation of the historical SPS scheme - with payments to farmers that already received direct payments in the reference period - does not influence the Dutch agricultural sector significantly. However, the milk quota abolition (or increase of the quota) as well as the implementation of regional SPS gradually decreasing to zero will importantly influence the relevant agricultural commodities.

The milk quota abolition, supported by lower butter and milk powder intervention prices, will lead to significant increases of the milk cows herd, the total cattle herd and the

milk production. Accordingly, milk and dairy product prices will fall with the most significant price drop observed for butter. This leads to structural changes in the dairy commodity production pattern. The production structure is characterized by a lower butter share in the total dairy commodities production.

The regionalization of payments will importantly affect the arable crop production and will lead to structural changes in the beef and veal sector. The most pronounced changes are observed for the arable crop sector when the SPS have been abolished. These lead to significant cuts in crop production levels (especially for coarse grains and rapeseeds) and to price increases. In the beef and veal sector, the regionalization of payments and the slaughter premium abolition will lead to a decrease of the veal production and an increase of the beef production. The total livestock herd is barely affected and the total beef and veal production is growing due to higher slaughter weights of animals.

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