PACIOLI 18

Proceedings of the 18th international workshop on micro-economic databases in agriculture

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Proceedings of the 18th international workshop on micro-economic databases in agriculture

Koen Boone
Colinda Teeuwen (eds.)

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The international Pacioli network shares knowledge on the management and use of agricultural micro-economic databases (such as Farm Accountancy Data Networks). Each year a workshop is organised by LEI, part of Wageningen UR, in close collaboration with a local organiser. The Pacioli 18 workshop took place in Ghent, Belgium, in September 2010.

Photo: LEI, part of Wageningen UR

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Preface

Innovative ideas face many hurdles to become successful implementations. This is also true in farm accounting and in Farm Accountancy Data Networks (FADNs). Therefore it makes sense to bring together the 'change agents', the persons that have a personal drive to change the content of their work and their organisations. For farm accounting and policy supporting FADNs it is appropriate to do this in an international context: this creates possibilities to learn from each other. By bringing FADN managers and data users in micro-economic research together, feedback is fostered.

It is with this background that the Pacioli network organises a workshop every year. This year already the 18th edition took place. This small but open network has become a breeding place for ideas on innovations.

Pacioli was originally a Concerted Action in the EU's Third Framework Programme for Research and Technical Development (AIR3-CT94-2456). After completion of the contract with the PACIOLI-4 workshop, the partners decided to keep the network alive at their own costs.

Pacioli 18 was organised in cooperation with the Flemish Ministry of Agriculture and Fisheries in Belgium. We want to thank them, and especially Ester Van Broekhoven and An Van den Bossche, for a perfectly organised workshop.

Prof. Dr R.B.M. Huirne
Managing Director LEI

1 Introduction

1.1 Pacioli 18 workshop

In cooperation with the Flemish Ministry of Agriculture and Fisheries, LEI organised the 18th international Pacioli workshop. The international Pacioli network shares knowledge on the management and use of agricultural micro-economic databases (such as Farm Accountancy Data Networks). The workshop took place from 5-8 September 2010 in Ghent, Belgium.

1.2 Pacioli 18 programme

Sunday, 5 September

20.00-21.30	Get together for informal drink

Monday, 6 September

08.30	Welcome by Koen Boone, LEI Wageningen UR, Netherlands
08.35	Welcome by Dirk van Gijseghem, Flemish Ministry of Agriculture and Fisheries
09.00	Introduction workshop programme (Koen Boone)
	Paper Session I: Simulating effects of changing CAP
09.30	'Farm viability after reduction of farm payments' Hans Vrolijk, LEI Wageningen UR, Netherlands
10.00	'The effects of regional flat rate on farm return in Italy; An analysis of FADN data' Antonella Bodini, Andrea Povellato and Alfonso Scardera, INEA - National Institute of Agricultural Economics, Italy
10.30	Break
	Paper Session II: Cost of production and Efficiency
10.45	'Flexible cost function estimation using FADN data' Rembert de Blander, EcRu, Belgium
11.15	'Estimation of production costs based on the German FADN' Frank Offermann and Anja Berner, von Thünen Institute vTI-BW, Germany
11.45	'Agricultural efficiency at the farm level' Andrew Woodend, DEFRA, United Kingdom
12.15	Lunch
13.15	*Workgroup Session 1: The future of the EU-Farm Return* 'A new farm return for the EU-FADN post-2013' Introduction by Thierry Vard, DG-Agri, European Commission
15.15	Break

Paper Session III: Typology and sampling

15.30	'A new typology for horticultural holdings in Flanders, Belgium' Nicole Taragola, Institute of Agricultural and Fisheries Research (ILVO) and Ester Van Broekhoven en Sanne Bouters, Flemish Ministry of Agriculture and Fisheries, Belgium
16.00	'The effects of the new typology: an analysis based on 2000 Agricultural Census data' Concetta Cardillo, INEA - National Institute of Agricultural Economics and Laura Esposito, ISTAT - National Statistical office of Italy, Italy
16.30	'The new Swiss FADN selection plan - on the expected accuracy of aggregated data' Andreas Roesch, Agroscope ART, Switzerland
17.00	Break
17.15	'Applying European methodology for FADN in a new member state : principles for statistical choices' Marju Aamisepp, Rural Economy Research Centre (Estonia) and Bernard Del'homme, Enita Bordeaux, France
17.45	'Statistical farm register' Anita Stamnova, State Statistical Office, Macedonia
18.15-18.45	'Farmer's risk exposure: statistical analysis based on micro-data' Christine Le Thi, OECD
20.00	Dinner

Tuesday, 7 September

Paper Session IV: Forecasting, dissemination and feedback to farmers

08.15	'The use of micro-simulation for making prognoses of incomes' Hennie van der Veen, LEI Wageningen UR, Netherlands
08.45	'Data dissemination in Finish FADN - Current situation and plans for the future' Arto Latukka, MTT Economic Research, Finland
09.15	'How pleased are farmers with the Flemish FADN?' Sanne Bouters, Flemish Ministry of Agriculture and Fisheries, Belgium
10.00	Break
10.15	*Workgroup Session 2: Design a new FADN website*
12.15	Lunch
13.00-21.00	Excursion

Wednesday, 8 September

	Paper Session V: Monitoring performance
08.30	'Profitability in cattle herding' Ann-Marie Karlsson, Swedish Board of Agriculture, Sweden
09.00	'Economic performance of Macedonian farms using FADN type data' Martinovska Stojceska, A., Faculty of Agricultural Sciences and Food - Skopje, Macedonia
09.30	'Comparing economic performance indicators for agricultural holdings between member states: interpreting differences and policy aspects' Boris Tacquenier and Dirk Bergen, Flemish Ministry of Agriculture and Fisheries, Belgium
10.00	'Monitoring sustainability of Dutch agriculture' Koen Boone, LEI Wageningen UR, Netherlands
10.30	Break
10.45	*Workgroup session 3: FADN: Tool for monitoring income or agricultural policy?*
12.45	Lunch
13.45	Leave for the airport

1.3 Welcome by Dirk Van Gijseghem, Flemish Ministry of Agriculture and Fisheries

On behalf of our Minister for Agriculture and Fisheries and on behalf of our secretary general, I welcome you to the city of Ghent for the 18th session of Pacioli.

General overview

The Flemish region is one of the three regions of Belgium, north of the Walloon region and the Brussels Capital Region.[1] Flanders is situated at the heart of Europe, with boundaries with the Netherlands, France and the other two Belgian regions. The Flemish region is part of the metropolitan regions of North West Europe.

The surface of the Flemish region covers nearly half of the Belgian territory (13,522 km^2 out of a total of 30,528 km^2). The Flemish population noticeably outnumbers its Walloon counterpart and the population density in Flanders is more than double the Walloon's region population density (in 2005 respectively 446/km^2 and 201/km^2).

As such, Flanders has one of the highest population density levels in Europe. The area with the highest population density is mainly situated in the central part of Flanders enclosed by the cities of Antwerp, Ghent and Brussels.

Agricultural characteristics

In Flanders, as in many other parts of Europe, the rural area is characterised by the farmed landscape. In Flanders, there are hardly any undeveloped areas left. The agricultural sector occupies more than half of the Flemish surface area.

[1] The three Belgian regions are situated on the NUTS 1 level (NUTS = Nomenclature of territorial units for statistics).

The municipalities have been divided into 11 groups, four of which are specialised orientations (breeding, vegetables, ornamental plants, and fruit), one dominant orientation (dairy) and six combined types. The typical regions are identifiable:

- fruit around Sint-Truiden;
- vegetables around Sint-Katelijne-Waver, Roeselare and Hoogstraten;
- ornamental plants around Ghent;
- and breeding in West-Flanders, the Meetjesland, the Land van Waas and the Campine;
- dairy in the Flemish Ardennes and the Pajottenland, and in the Campine in combination with breeding;
- beef cattle in the region around Bruges, southern West and East-Flanders;
- and in Flemish-Brabant and South-Limburg in combination with arable farming.

The locations of the regional concentrations and specialisations generally have a historical background. Thus the locations of the municipalities with a breeding typology are explained or partly explained by the locations of the mixed-feed industry and the abattoirs, and the municipalities with a vegetable or fruit typology are also located around the auction houses and derived industry.

Arable farming and dairy and beef cattle farming are primarily explained by soil-physical factors: arable farming on rich soils and livestock farming on other soils.

Ornamental plant cultivation is historically concentrated around Ghent.

Number and average area of agricultural businesses

The number of agricultural businesses in Flanders is constantly falling. With respect to 1998, this number has fallen by 32% to 29,446 businesses in 2009. This is a fall of 2.9% per year on average. Of the total number of businesses in Belgium, 66% are in Flanders.

It is mainly the smaller businesses that are disappearing. The remaining businesses are getting bigger. With respect to 1998, the average area of cultivated land per business has increased by 44% to 21.0 ha.

The agricultural area varies greatly according to the type of business: from 7.9 ha for specialised horticultural businesses to 28.5 ha for mixed businesses. The low value in horticulture is attributable to businesses with greenhouse cultivation.

As a result of the scale increase, increasing numbers of companies are being set up. In 2008, 2,696 businesses or 8.8% of all agricultural businesses were operated as a legal entity. This is almost double the number in 1998.

Final production value

The final production value of Flemish agriculture and horticulture is EUR4.5 to 5bn and presented a slight increasing trend between 2000 and 2008. It should be noted that the compensating amounts under the CAP reforms (operating subsidies, nurse cow premium, etc.) are not included in the production values.

Flanders has a share of approximately 75% of the national final production value. Save for a number of arable farming products, Flanders clearly accounts for more than half of the most important products. For pigs, vegetables, fruit and ornamental plants, the share is even more than 90%.

The final production value is broken down as follows: 8.5% from arable farming, 32.1% from horticulture and 59.4% from livestock. The three products that contribute the most to the turnover in Flanders are: pork, vegetables and dairy products.

Eco efficiency of agriculture

A comparison of the development of the environmental pressure from agriculture to the gross added value of agriculture gives an indication of the eco-efficiency of the sector. For 2007, the gross added value of the agricultural sector is estimated to be EUR2.3bn, against EUR2.9bn in 2000. This fall of 23% is the result of increasing production prices on the one hand and falling sales prices and shrinking production on

the other. Over the period 2000-2007, the environmental pressure of agriculture clearly decreased, except for the erosion sensitivity of land usage and, in the last few years, pesticides.

In the period 2000-2007, both the acidifying (-28%) and fertilising emissions (-67%) fell substantially. This fall is due to the fertiliser policy and the economic climate, which can be seen in shrinking livestock numbers. The fertiliser policy has reduced the use of synthetic fertilisers, the application of low-emission techniques, a lower nutrient content for fodder and increasing manure processing. The shrinking livestock numbers explains the decrease in greenhouse gas emissions (-13%) and fine dust emissions (-10%).

The erosion sensitivity of land usage rose by 4% between 2000 and 2007 due to the choice of more erosion-sensitive crops such as maize and potatoes. The pressure on water life due to crop protection had fallen in 2003 by 44% with respect to 2000. This large decrease can be attributed to a ban on the use of the most polluting pesticides. In 2004 and 2005, however, there was a slight increase.

Development of Belgian agricultural trade

The total Belgian trade in agricultural products shows a positive trade balance. Both imports and exports are increasing significantly. In contrast to the general trend in foreign trade, the agricultural trade surplus increased by 5.5% in 2008. It is now EUR3.5bn. In 2008, total exports came to EUR34.1bn, while imports of agricultural products were EUR30.6bn. As a comparison: EUR30.1bn of agricultural products were exported and EUR26.7bn were imported in 2007.

The share of imports and exports of agricultural products in total Belgian trade is 9.6% and 10.6% respectively, which indicates the not to be underestimated importance of the agricultural sector for Belgian exports. Figures from the National Bank of Belgium show that Flanders is responsible for 82% of national imports and 83% of national exports of agricultural products.

The EU member states are the most important agricultural trading partners, even more so than in total Belgian trade. 73% of imported agricultural products come from the EU and 84% of exported agricultural products go to EU member states. Within the EU, the neighbouring countries in particular are of great importance.

Division for policy analysis

In the Division for Policy Analysis, about 70 people are employed.

The division is responsible for:

- the Farm Accountancy Data Network;
- and works as a policy advisory service for the Minister of Agriculture;
- and is responsible for the Platform for Agricultural Research.

Reports:

- *Agriculture report 2008* (2 yearly);
- *Pocket agricultural indicators*;
- And many other reports …

2 Farm viability in the EU

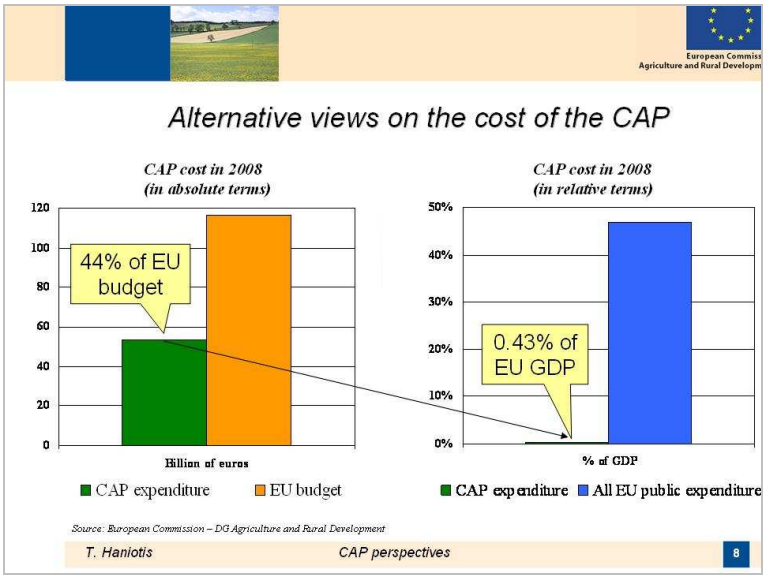
Impact of reduction of farm payments

Dr. Hans C.J. Vrolijk
LEI (Agricultural Economics Research Institute)

Problem description

- Farm viability depends on level and volatility of incomes
- Level of income depends to different extents on farm subsidies
- Farm payments under discussion

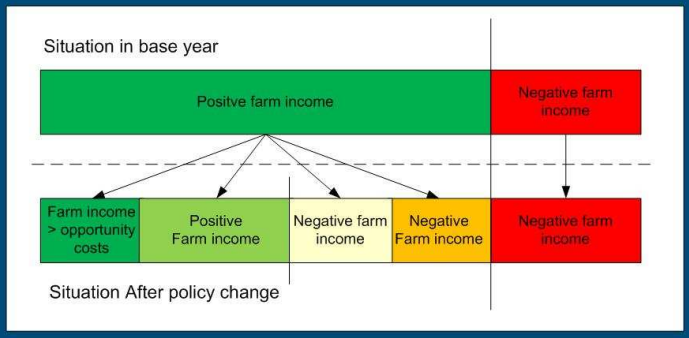
- Research objective
  - Importance of subsidies in the agricultural sector
  - Impact of reduction of payments on viability of farms



Methodology

- FADN dataset
  - Most detailed micro-economic dataset
  - Includes the variety among farms in a country
  - Focus on income from farming
- Three scenarios evaluated:
  - All farms subsidies
  - Decoupled payments
  - Decoupled payments plus production related subsidies

Farm viability categories



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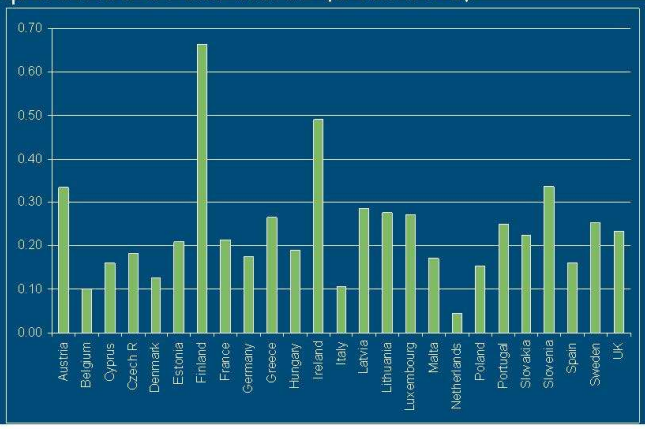
Importance of subsidies (countries)



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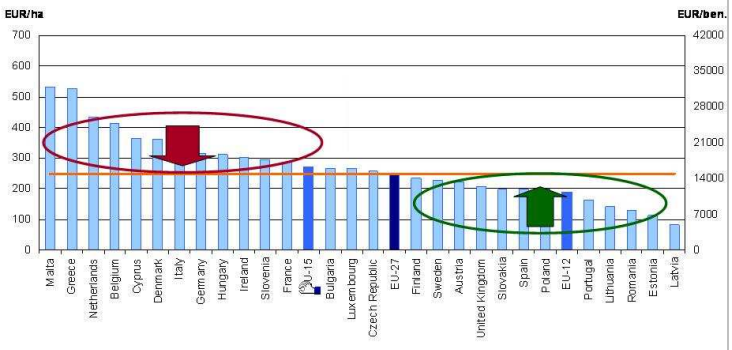
Average payments per ha (UAA) and per beneficiary



Source: European Commission – DG Agriculture and Rural Development

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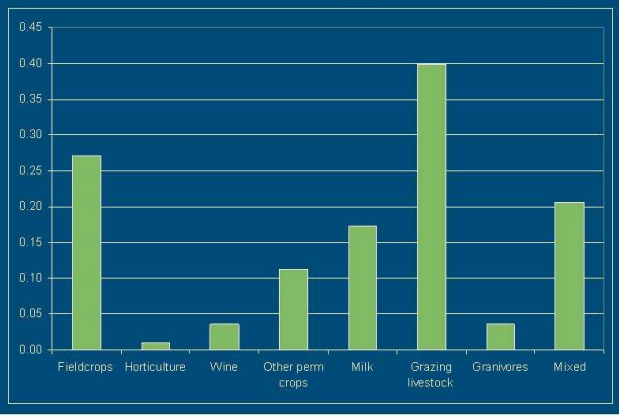
Importance of subsidies (types of farming)



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Results (national results bottom and top 5)

Table 5.2	Countries with highest percentage of farms			
Category 1	Category 2	Category 3	Category 4	Category 5
Lithuania	Spain	United Kingdom	United kingdom	Denmark
Latvia	Italy	Sweden	Slovakia	Cyprus
Luxembourg	Austria	France	Ireland	Sweden
Belgium	Poland	Denmark	Denmark	Slovakia
Estonia	Estonia	Finland	Germany	Slovenia

Table 5.3	Countries with lowest percentage of farms			
Category 1	Category 2	Category 3	Category 4	Category 5
Ireland	Denmark	Slovenia	Luxembourg	Latvia
Sweden	Slovakia	Luxembourg	Cyprus	Lithuania
United kingdom	United Kingdom	Latvia	Slovenia	Greece
Denmark	Sweden	Spain	Lithuania	Spain
Finland	Lithuania	Estonia	Poland	Poland

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Results (national results)

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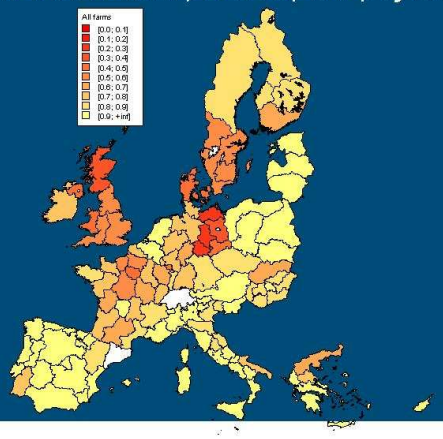
Results (national results, decoupled payments)



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Results (arable, decoupled payments)

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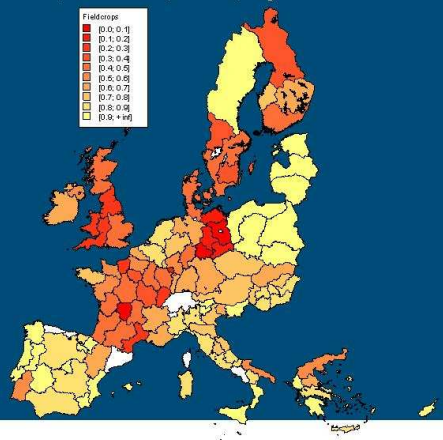
Results (arable, decoupled payments)



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Results (arable, decoupled and product payments)

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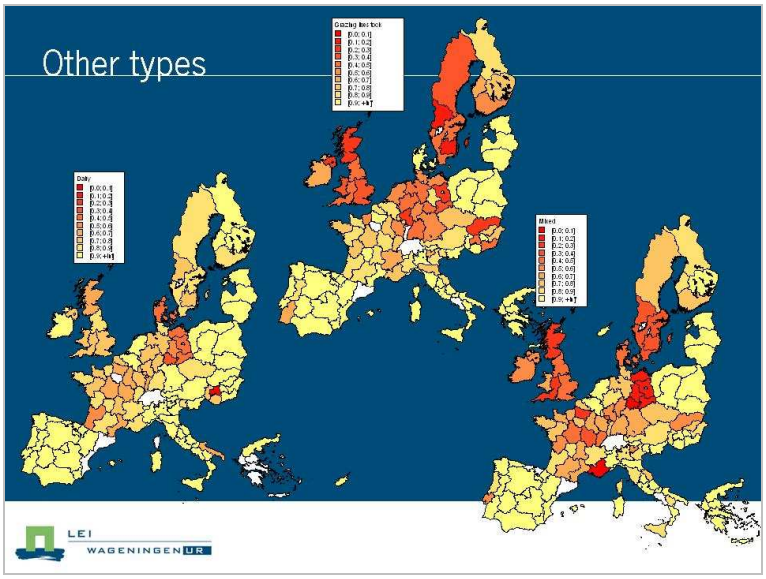
Other types



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Other impacts of abolishment of farm payments

- Simulation describe first order impacts
- Other indirect effects
  - Adaptations of farmers
  - Land prices
  - Structural change
  - Risk exposure
  - Prices of products

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Sensitivity

- 20% price increase of output and intermediate consumption
- 15% of farms improve viability class
- 3.5% shift from negative to positive income
- Large number of farms shifting to positive income in Denmark (12%), France (8%), Germany (8%), Luxembourg (7%) and the UK (7%)

Discussion

- Limitations of approach
  - First order impacts
  - Assumption of fixed cost structure
  - Only income from farming included in the analysis

Conclusions

- Denmark, Ireland, Sweden and UK heavily affected, for some types France, Germany, Hungary and Slovakia
- CAP types of farms less vital, adaptations can be expected, intensive sectors (horticulture, permanent crops and granivores) less affected
- Land related farming activities most affected, impact on rural areas
- FADN of great importance to estimate effects at farm level, integration with other agricultural models

3 Effects of regional flat rate on farm return in Italy An analysis based on FADN data

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3.1 Abstract

While the debate on the future shape of CAP after 2013 is going on, the continuation of direct supports to European farmers does not seem to be under discussion. Full decoupling also does look inevitable. Italy and eight other Member States operate the historical model for SPS payments. The Health Check suggests a moderate approach to distribute direct payments for the next future. Regional flat rate per eligible area is taken into account in this analysis to assess the effects on farm income.

The use of Italian FADN data has allowed describing the economic results of the current situation (accounting year 2007) and to appraise the redistribution effects on wealth of farmers after the implementation of the flat rate approach. For simplicity - and even for political considerations - the regional plafond within the 20 Italian regions was kept unchanged.

For ease of interpretation and comparability and according to literature, the Net Value Added (NVA) was chosen as main indicator of global farm efficiency and farm stability in remunerating production factors. The amount of subsidies redistributed to all agricultural holdings is first pillar subsidies, accounting for about 87% of all subsidies received by farms.

Preliminary results show that there will be a shift in terms of contribution of subsidies to the NVA from farms specialised in field crops to farms with permanent crops and horticulture. The results suggest that in the future the criterion for redistribution could be related to ecosystem services provided by farmers, rather than remaining an aid linked to the past.

Keywords: FADN, regional flat rate, subsidies distribution, income effect

3.2 Introduction

The 2003 reform of the CAP introduced a new system of direct payments, known as the Single Payment Scheme, under which aid is no longer linked to production (decoupling). Most of the support provided in the different sectors has been transferred from the Common Market Organisations (CMOs) to the new system of direct payments during the period 2005-2008. The Single Payment Scheme (SPS) is the most important system of direct payments. Italy and eight other Member States operate the historical model for SPS payments.

The current debate on the future shape of CAP after 2013 let envisaging that direct supports to European farmers will be granted, however with different criteria of distribution among farmers. Full decoupling also does look foreseeable. The Health Check has indeed suggested a moderate approach to distribute direct payments for the next future. Regional flat rate per eligible area can be taken into account to redistribute subsidies to all agricultural holdings in Italy.

Previous attempts have been made to assess the effects of regional flat rate on income in Italy (Anania and Tenuta, 2008; Pupo D'Andrea, 2008). The analyses have involved various definitions of regions and different assumptions have been made on the amount of subsidies to be redistributed. Both researches have taken into account entitlements and special rights owned by farmers, using administrative data from

the Payment Agency. In both cases researchers have formulated different hypothesis of region definitions, one that split the country in 20 regions as the administrative ones, and one that consider the whole country as a unique region. In the work of Pupo D'Andrea (2008) approached a third hypothesis that considers the country (Italy) was divided in 4 main geographical areas (aggregation of multi-region), whereas Anania and Tenuta (2008) have adopted an approach that combined the administrative regions and the altitude zone. At European level, Vrolijk et al. (2010) quantify the importance of subsidies on the farm income and explore the impacts of more radical changes in farm subsidies (zero payments) on the viability of farms and regional differences in farm viability.

In this research given the available structural and economic information of FADN data, the aim is firstly to give an overview on payments received by the Italian farmers according to the current payment scheme in 2007, and secondly to analyse the effect on farm income after the scenario of the adoption of regional flat rate.

3.3 Method

A preliminary analysis was run on the current distribution of subsidies within Italian agricultural holdings according to 2007 FADN. The distribution has been analysed according to the type of farming and economic size, as well as according to altitude area. The latter classification variable is significant at national level and allows giving alternative insights of results to previous researches.

There can be different regional flat rate approaches, stemming from different definitions of region. To simplify the analysis and similarly to Anania and Tenuta (2008), we assumed that every administrative region will not change its *plafond* and will redistribute an average aid to all agricultural holdings irrespective to farm type and economic size, or any other classification variable.

To describe the current and future situation of agricultural holdings structural and economic key figures are taken into account. According to literature (Johnson et al., 2007) the Net Value Added (NVA) is the most suited variable to assess the value of goods and services generated by farms accounting for total production, whether sold or consumed within farms. With this variable different farm indicators can be calculated in order to compare farms and quantify the amount of subsidy that enter the NVA. The NVA allows assessing the remuneration of all production factors and represents a good *proxy* for the social role of agriculture.

The analysis involved Italian FADN dataset of 2007.[1] The subsidies taken into consideration do not include subsidies on investments, thus only subsidies on working capital. Even though the decoupling process was partially implemented in 2007, the exercise was run *as if* all UAA were eligible and the first pillar subsidies per hectare were used *as if* all payments were decoupled. The first pillar subsidies were isolated from the other subsidies on working capital (mainly Rural Development payments) and redistributed according to two approaches of regional flat rate. Within first pillar, besides SPS and modulation, coupled payments were included.

3.4 Current economic results

Net Value Added - Farms receiving the above described first pillar subsidies account for 75% of the NVA generated in the Italian agricultural sector. On the other hand 25% of the NVA belongs to farms that do not receive any first pillar subsidies. The NVA/AWU is on average at about €22.700, above average agricultural holdings in the North of the country and on the plain area. The ability of farms to remunerate the production factors per Labour Unit is below average on mountain and hilly areas, this results is justified by the type of farming most run in these areas. Field crops are most cultivated on the plain area, whereas grazing livestock is more concentrate on the mountain area.

[1] Random sample is adopted in the Italian FADN survey. The threshold of Italian FADN sample is 4 ESU.

As a matter of fact, in farms specialised in field crops 41% of the NVA is generated by subsidies, whereas in farms with granivores this amount accounts only for less than 5%. From the altitude perspective it looks like on the mountain area, where the risk of abandonment is higher, the subsidies accounts only for 18% on the NVA, whereas the rich areas are more subsidised.

Type of farming	**NVA/AWU (€)**
Specialist field crops	22,700
Specialist horticulture	19,647
Specialist permanent crops	15,990
Specialist grazing livestock	31,903
Specialist granivores	77,801
Mixed cropping	14,704
Mixed livestock holdings	18,811
Mixed crops-livestock	23,450
Total	*22,737*

As expected the NVA/AWU increases by ESU, due to the better allocation of the labour units in the large scale farms.

ESU	**NVA/AWU (€)**
4-<8	9,743
8-<16	11,692
16-<40	18,400
40-<100	30,610
>=100	56,384
Total	*22,737*

Subsidies

According to FADN data, farms without subsidies accounts only for 7% in terms of UAA. Farms receive 96% of the subsidies on working capital, whereas only 4% on investments. Within subsidies on working capital, first pillar subsidies represent 91% of the total, of which 78% is covered by SPS and Modulation and 12% by other coupled payments. Only 9% of the subsidies on working capital are granted through second pillar (6% through agro-environment schemes and 2% due to Less Favoured Area).

The calculated average value of subsidies per hectare is €355/ha. Farms on plain area receive on average €490, whereas farms on mountain area are below the average.

Altitude area	**Subsidy (€/ha)**
Mountain	187
Hills	311
Plain	491
Total	*355*

From the type of farming perspective, the results show, as expected, that horticultural-specialist farms receive less than the average per hectare aids. Granivores represent a special case in Italy, as the specialist farms in granivores livestock are most of the time profit-sharing farms, thus they own little amount of UAA and livestock is not owned by the breeding farmer. So the ratio of subsidy per hectare is high.

Type of farming	Subsidy (€/ha)
Specialist field crops	403
Specialist horticulture	241
Specialist permanent crops	358
Specialist grazing livestock	319
Specialist granivores	419
Mixed cropping	278
Mixed livestock holdings	306
Mixed crops-livestock	307
Total	*355*

Subsidies per hectare

According to 11 groups by which the sample was divided, the distribution of subsidies is shown in the table below, giving an alternative perspective to the current situation of direct payments in Italy. Farms receiving less than €100/ha cover/use about 16% of the UAA and receive 2% of the subsidies. Farms granted with very high per hectare subsidies (5% of the holdings) cover/use 4% of the UAA, but are granted with 20% of the subsidies. This envisages that there is high concentration of aids on a small number of profitable farms. The payment class of €300-400/ha shows that 20% of subsidies are linked to about 20% of UAA. Farms above average value of NVA/AWU (€22,156/ha) are those receiving more than €300 per hectare subsidies. Farms without subsidies seem to be at a good level of competitiveness.

Subsidy (€/ha)	Number (%)	UAA (%)	AWU (%)	NVA (%)	Subsidies (%)
W/Out Subsidies	24	7	27	25	0
<100	10	16	11	8	2
100-200	14	15	13	9	7
200-300	15	18	14	11	14
300-400	14	19	12	12	20
400-500	10	11	8	9	14
500-750	6	7	6	8	12
750-1,000	3	4	3	6	10
1,000-2,000	4	3	4	8	12
2,000-5,000	1	1	1	2	6
>5,000	0	0	0	1	2
Total	*100*	*100*	*100*	*100*	*100*

3.5 Economic results after regional flat rate

We assume two possible options:

a. *100% regional flat rate*, that is the implementation of the regional flat rate to all the UAA and farms without any change in the total amount of subsidies currently (2007) paid to the farms;
b. *70% regional flat rate*, that is the implementation of the regional flat rate to all the UAA and farms with a 30% reduction on the total amount of subsidies currently (2007) paid to the farms.

a. *100% regional flat rate*

After redistribution the total amount of first pillar aids, the distribution of subsidies per NVA remain stable for classes of payments of €200 to €500/ha, the percentage of subsidies accounting for NVA increases in farms that have received less than €200/ha. Inequalities are high in farms with current subsidies above €500/ha. Looking at the distributional effects from a broader perspective the

distribution look quite homogenous but farms with higher subsidies per hectare above €750/ha look worse off in terms of NVA/AWU.

b. *70% regional flat rate*

As expected the results show a worsening of the situation for most of the farms type and from the altitude zone perspective, it looks like mountain farmers would be better off than farmers on the plain area.

% Change in NVA	After flat rate 100% (%)	After flat rate 70% (%)
Mountain	8	2
Hills	1	-5
Plain	-3	-7
Specialist field crops	-4	-14
Specialist horticulture	1	0
Specialist permanent crops	2	-2
Specialist grazing livestock	-1	-6
Specialist granivores	1	-2
Mixed cropping	4	-7
Mixed livestock holdings	0	-6
Mixed crops-livestock	2	-5
Total	*0*	*-5*

3.6 Final remarks

Any scheme of regional flat rate implies a redistribution of subsidies. The redistribution is significant according to the definition of region, of subsidy and if the redistribution takes into account derogation such as farms with special rights. Policy makers should take into account the costs of farms losing after redistribution and benefits of farms gaining after redistribution. This means taking into consideration the social welfare and the choice of a common criterion for redistribution. The shared criterion could be represented by the fact that many farms, especially on less favoured areas and on mountain areas, provide public goods through the maintenance of extensive production systems.

Thanks to off-farm income Italian farms will be less affected by the redistribution. Also the high variability of farm specialisation wealth and income will be less affected. These preliminary results give insights into how mountain farmers need to be encouraged for the public good (ecosystem services) they provide the society, such as the preservation of landscape and environmental resources. The results suggest that direct payments should be based on the remuneration of externalities rather than mere income aid. Direct payments will shift from being an income support to a tool useful for the global welfare for farms operating within the same area (region). This may represent a step towards equality.

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4 Estimating flexible cost functions using EU-FADN and Eurostat data

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Estimating Flexible Cost Functions using EU-FADN and Eurostat Data

Rembert De Blander and Bruno Henry de Frahan

6th September 2010 - Ghent

Cost Function

- Based on Symmetric Generalised McFadden (SGM) cost function
  - invariant to normalization
  - restrictions do not destroy flexibility
  - no unrealistic input demand elasticities ($\leftrightarrow$ translog)
- Addition of third-order tems in outputs (Y_1^3, $Y_1^2 Y_2$, . . .)
  - allows for a U-shaped marginal cost (MC) function
  - a quota system could force farms to operate on the downward sloping part of their MC function.

$$
\begin{aligned}
TC &= (\theta'W)\, a'Yt + (\phi'Y)\, \beta'Wt + Y'CW + Z'DW\,(\phi'Y) \\
&\quad + \frac{1}{2}(\theta'W)^{-1} W'EW\,(\phi'Y) \\
&\quad + (\theta'W)\left\{ Z'FZ\,(\phi'Y) + Y'GY + Z'HY + \sum_{m}^{M} y_m\,(Y'Q_mY) \right\}
\end{aligned}
$$

- output quantities $Y = (y_1, \ldots, y_M)'$
- input prices $W = (w_1, \ldots, w_I)'$
- fixed inputs $Z = (z_1, \ldots, z_K)'$

Input markets

- Optimizing behavior
  - no need for third-order terms in prices
  - Shepard's lemma provides the optimal input demand equations
  - equating observed unput with optimal input, provides us with I input demand equations.

Restrictions

- symmetry restrictions: coefficients with permuted indices are identical.
- adding up constraint: $\sum_{j=1}^{J} e_{ij} = 0$.

Monotonicity conditions

non-decreasing in output quantities (marginal costs not negative): imposed

non-decreasing in in input prices (input demands not negative): verified

non-increasing in fixed inputs: verified

Non-negativity of $MC_m = \frac{\partial TC}{\partial y_m}$

1. the estimated marginal cost may not be negative for any of the observed outputs of farms.
2. the minimum of the marginal cost curve on $Y = [0, \infty)^P$ should be positive.

Curvature conditions

- Concavity of TC in input prices: negative semidefiniteness of $E = -L_E \cdot L'_E$
  - where $L = \begin{pmatrix} l_{11} & & & 0 \\ l_{21} & l_{22} & & 0 \\ \vdots & \vdots & \ddots & \vdots \\ l_{I1} & l_{I2} & \cdots & l_{II} \end{pmatrix}$
  - adding up constraint: $\sum_{i=1}^{I} l_{ij} = 0$.
- Convexity of TC in fixed inputs: positive semidefiniteness of $F = L_F \cdot L'_F$

Curvature conditions

- Convexity of TC in output quantities (standard SGMcFadden): positive semidefiniteness of $G = L_G \cdot L'_G$
- Convexity of$MC_m = \frac{\partial TC}{\partial y_m}$ in output quantities (augmented SGMcFadden): positive semidefiniteness of $Q_m = L_{Q_m} \cdot L'_{Q_m}$.

Data

- 3 panels for each country: dairy, livestock and crop farms (based on TF classification)
- Outputs and inputs aggregated into a limited number of categories
- Törnqvist price indices for each category
- Prices: farmgate prices → regional averages →national average →Eurostat prices

Bovine farms

Inputs	Outputs
animal-specific inputs	dairy
crop-specific	other animal products
cows	crop products
intermediate	
purchased	
2 types of land	

Crop farms

Inputs	Outputs
fertilizers	oil and protein seeds
pesticides	cereals
seeds	potatoes
services	industrial crops
capital inputs	winter wheat
land	

Results: dairy LT

Input demand elasticities

Variable	Obs	Mean	Std. Dev	Min	Max
ϵ_{x_1,w_1}	123463	-0.0005	0.0004	-0.0066	-0.0000
ϵ_{x_2,w_2}	123463	-0.0009	0.0005	-0.0058	-0.0002
ϵ_{x_3,w_3}	123463	-0.5259	0.2544	-5.0292	-0.0513
ϵ_{x_4,w_4}	123463	-0.0539	0.0196	-0.1930	-0.0090
ϵ_{x_5,w_5}	123440	-0.0643	0.3211	-19.268	-0.0030

Results: dairy LT

Marginal costs milk

Variable	Obs	Mean	Std. Dev	Min	Max
MC_{y_a} (€/ton)	120379	145.213	5.735	132.59	161.67
MC_{y_a} (%)	120379	0.5146	0.0105	0.4786	0.5559

Results: dairy LT

Technology characteristics

Variable	Obs	Mean	Std. Dev	Min	Max
$ORTS$	110311	1.104	0.144	0.979	1.689
$PSRTS_{y_a}$	119187	1.034	0.021	0.996	1.074
$ESCP$	113327	1.026	0.023	0.992	1.107

5 Estimation of production costs based on the German FADN

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5.1 Introduction

A central problem in determining per unit costs of production in agriculture originates from the fact that most farms produce multiple outputs, while standard farm-accounting data is only available at whole-farm level. Direct collection of enterprise-level information via farm surveys is time-consuming and costly, and existing studies (e.g. IFCN, Agribenchmark) are therefore often limited to small samples. A common alternative is the use of general pragmatic allocation rules to distribute costs to single products, based on e.g. their respective share in total output or land use (e.g. EU Commission, 2010). The drawback is that the allocation may not always be appropriate, and thus this approach is often limited to applications for main products in specialised farms. Approaches based on econometric techniques may offer an alternative for obtaining reliable estimates.

This paper reports first results and experiences made within the EU research project FACEPA[1] concerning the development and application of an econometric method to estimate production costs based on FADN data. First the data base and the method used are explained in more detail. Then results are presented, differentiating production costs of key products by region and other farm characteristics. The paper ends with a discussion of encountered estimation problems and related conclusions.

5.2 Method and data base

Data from the German Farm Accountancy Data Network is used for this study. The sample consists of approximately 11,000 farm accounts per year. The production cost analysis includes 16 aggregated input categories, including subsidies (defined as negative input) and net value added, as well as 31 output categories. To estimate the model various techniques can be applied (e.g. OLS regression, Bayesian, Generalised Maximum Entropy, and Linear Programming approaches). A discussion of related econometric issues is given by, e.g. Errington (1989), Midmore (1990), Hallam et al. (1999), Léon et al. (1999). Here, the model is estimated based on the so-called seemingly unrelated regression (SUR).

To estimate the cost-allocation coefficients from farm accounting data a set of linear equations is considered where the derived demand from farm f for each input i is represented as a function of several outputs k (Peeters and Surry, 2003). The relevant microeconomic unit is assumed to be the professional farm holding, therefore the model derives the empirical estimates from the FADN statistical database. The output of the various products is denoted $y_k (k = 1,.....,K)$ and the $x_i \ (i = 1,.....,I)$ represent the non-allocated costs of the production factors. Assuming I inputs used by F farms to produce K outputs the set of equations can be written as (Peeters and Surry, 2003):

[1] The research leading to these results has received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement no 212292.

(1) $$x_{if} = \sum_{k=1}^{K} \beta_{ik} y_{kf} + u_{if} ,$$

where x_{if} is the total cost of input i paid by farm f (including subsidies and net value added);
y_{kf} is the total value of output k produced by farm f;
β_{ik} is the unknown technical production coefficient, which is defined as the average (for all farms) expenditure on input i required to produce one unit of output value k;
u_{if} is the error term specific to each input and farm.

On each farm f, the observed costs in input i differ from the theoretical costs by a random factor u_{jf} of zero expectation and is independent from one farm to the next. This means that the use of input i by a given farm is not affected by another farm use of the same input.

In order to achieve the accounting consistency of the model, we have to introduce the constraint that the sum of output values equals the sum of input costs plus net value added the model is estimated subject to:

(2) $$\sum_{k=1}^{K} \beta_{ik} = 1$$

This equation ensures that the production coefficients add up to one.
The subsidies enter the model as an independent variable with negative values. Thus, it is possible to derive the average amount of subsidies associated with the production of one unit of output value k. The net value added is composed of the sum of output value plus subsidies minus input costs. Using the aforementioned nomenclature this relation can be written as:

(3) $$\text{Net value added}_{\,f} = \sum_{k=1}^{K} y_{kf} - \sum_{i=1}^{I-1} x_{if}$$

5.3 Results

An overview of the primary model output is given in Table 1. The costs coefficients indicate the share that individual cost components have in total output. The variation over years is therefore also due to changes in output as a consequence of yield and price fluctuations. In this example, most of the coefficients are statistically significant; however a few of the coefficients show small negative values. The negative subsidies are a consequence of the model specification, where subsidies are treated as negative inputs.

Table 5.1	Estimated costs coefficients for wheat, Germany, 1996-2008												
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Seed and plants	0.05	0.05	0.08	0.04	0.05	0.04	0.05	0.04	0.04	0.07	0.06	0.04	0.03
Fertiliser	0.11	0.07	0.08	0.11	0.11	0.07	0.11	0.10	0.13	0.18	0.12	0.10	0.14
Plant protection	0.14	0.16	0.18	0.15	0.16	0.15	0.15	0.16	0.19	0.21	0.17	0.09	0.10
Fuels	0.05	0.06	0.04	0.05	0.07	0.07	0.07	0.06	0.10	0.11	0.09	0.04	0.07
Other energy	0.01	0.01	0.00a)	0.00a)	0.01	0.02	0.01	0.00a)	0.01	0.01	0.01	0.01	0.01
Contract work	0.03	0.03	0.05	0.00a)	0.06	0.06	-0.01a)	0.08	0.03	0.05	0.02	0.02	0.02
Maintenance buildings	-0.02	0.00a)	-0.02	0.00a)	0.01	0.02	0.02	0.02	0.04	0.01	0.04	0.02	0.03
Maintenance machinery	0.02	-0.01	0.03	0.02	0.04	0.05	0.04	0.06	0.05	0.04	0.04	0.01	0.02
Other costs	0.13	0.12	0.10	0.03	0.05	0.08	0.04	0.07	0.08	0.03a)	-0.04	0.01	-0.01
Depreciation	0.20	0.17	0.18	0.24	0.24	0.12	0.20	0.12	0.18	0.19	0.18	0.10	0.13
Subsidies	-0.27	-0.19	-0.26	-0.22	-0.29	-0.28	-0.36	-0.33	-0.42	-0.01	0.00a)	0.04	-0.01
Net valued added	0.54	0.53	0.54	0.57	0.47	0.59	0.68	0.63	0.57	0.11	0.32	0.52	0.48
Output plus subsidies €/ha	1,148	1,028	998	1,053	1,059	1,107	943	1,026	1,086	713	867	1,320	1,193
Production costs I €/ha	663	565	571	560	671	594	470	540	651	636	592	611	622

a) Not statistically significant at 95% level.
Source: German national FADN and own calculations.

In the following, based on the estimated coefficients, production costs have been recalculated as per unit costs (e.g. per ton), and results have been averaged over three accounting years to increase their robustness. For the graphical presentation, the costs have been aggregated as follows:

- *Specific cost*
  Costs for feed, veterinary costs, other specific animal production costs, seed, fertiliser and crop protection.
- *Non-Specific cost*
  All other costs, except depreciation (fuel, other energy cost, contract work, building, machinery, other costs and taxes).
- *Production cost (I)*
  All costs described under specific and non-specific cost, including depreciation.

For full cost estimation, in addition the costs for land, labour and capital have been included in the estimation model.

- *Land costs*: All costs for renting land; *Labour costs*: Costs for hired labour; *Interest*: Interest costs.
- *Own land*: Imputed costs for own land; *Family labour*: Imputed costs for own labour; *Interest on own capital*: Imputed interest for own capital.

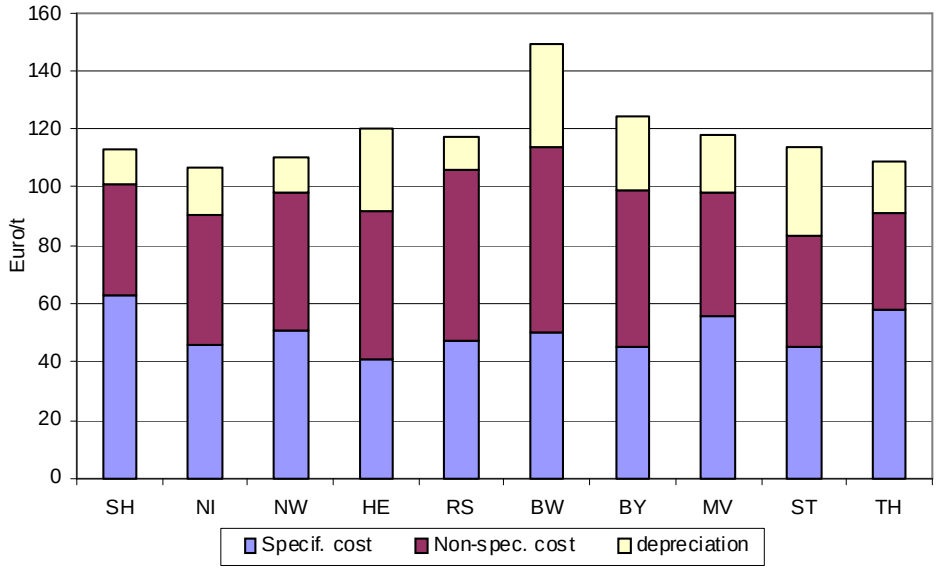
Allocation of subsidies excludes the decoupled single farm payment.

- *Subsidies*: First pillar payment excluding decoupled single farm payment, plus 2nd pillar subsidies.

Production costs in different regions

The average (2006-2008) production costs (I) per ton of wheat for different German regions are shown in Figure 5.1. The differences in production costs (I) between different regions are generally not very pronounced, with the exception of Baden-Württemberg, which exhibits the highest costs. The highest value for specific costs are estimated for Schleswig-Holstein, whereas of Baden-Württemberg has the highest costs for non-specific costs and depreciation. Results for Brandenburg and Saxony were judged implausible due to larger negative coefficients and are thus not displayed here.

Figure 5.1 **Production costs (l) per quintal of wheat for different German regions (Ø 2006-2008)**

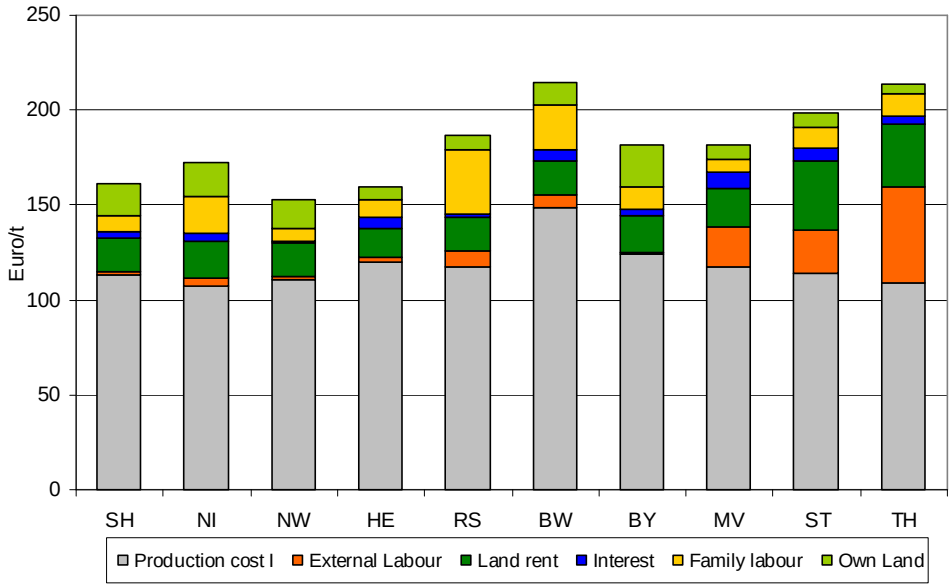


Source: German national FADN and own calculations.

Figure 5.2 shows the average full costs per ton of wheat for different German regions. The production costs (l) are the same costs as shown in Figure 1 (sum of specific cost, non-specific cost and depreciation). In addition, costs were estimated for external labour, land rent, and interest as well as the imputed costs for own factors such as family labour, own land and interest on own capital. The results reflect that farms in the old member states have higher costs for own factors, especially for own labour, whereas farms in the new member states have higher costs for hired labour and rented land. Baden-Württemberg still shows the highest total costs with €228/t. However, for some regions the level of labour costs does not seem realistic (e.g. RS, TH) and points to estimation or data problems.

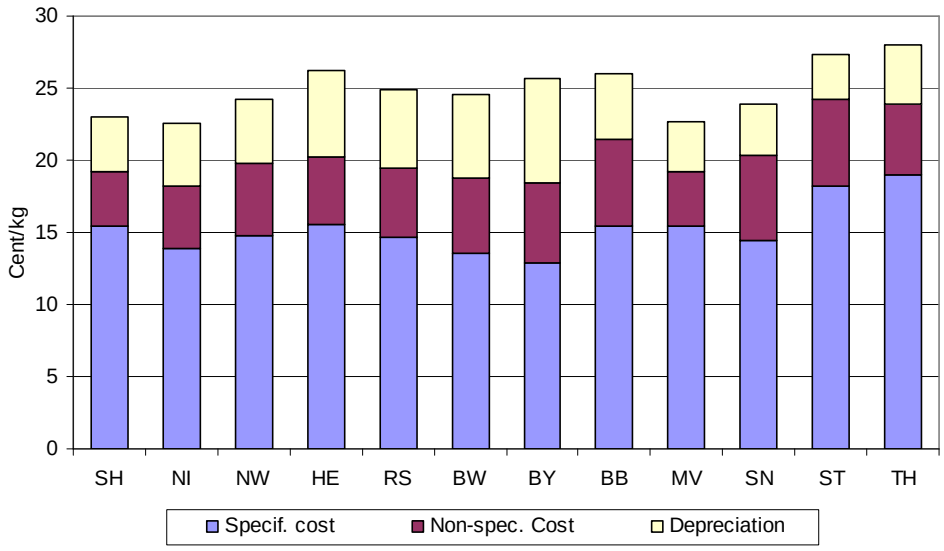
In Figure 5.3 the average production costs (l) per kg of milk during 2006-2008 are illustrated. The highest mean production costs (l) can be found for Thuringia with 28 cent/kg and the lowest are found in Lower Saxony with 22.6 cent/kg. Thuringia also shows the highest value for specific costs, Saxony-Anhalt has the highest value for non-specific costs, and Bavaria for depreciation.

Figure 5.2 **Full costs per ton of wheat for different German regions (Ø 2006-2008)**



Source: German national FADN and own calculations.

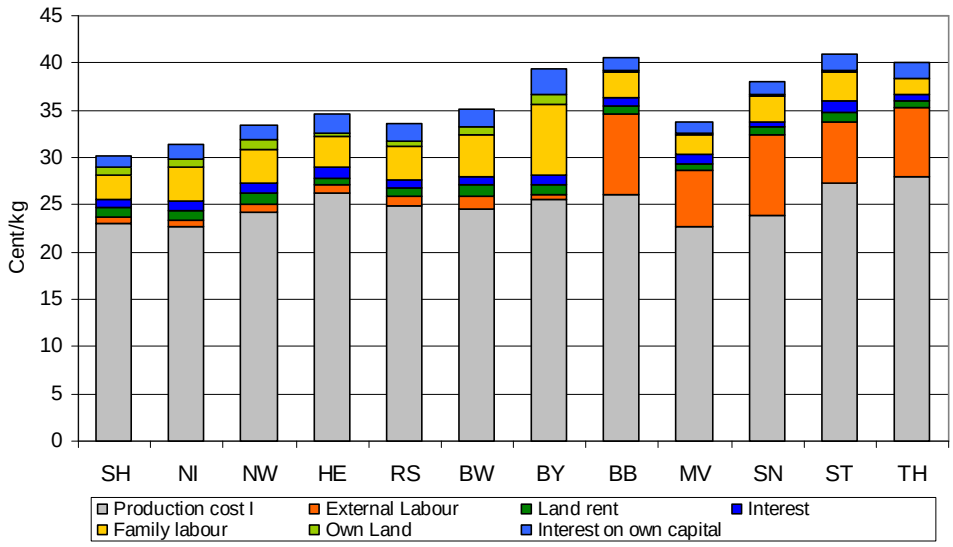
Figure 5.3 **Production costs (I) per kg of milk for different German regions (Ø 2006-2008)**



Source: German national FADN and own calculations.

In Figure 5.4 once again the production costs (I) are illustrated together with costs for external labour, land rent and interest as well as costs for only factors such as family labour, own land and interest on own capital. As for wheat the difference in the cost structure between new and old member states becomes obvious. Whereas the old member states have again higher costs for own factors, the new member states have much higher costs especially for external labour. External labour costs are highest in Brandenburg and Saxony, with 8.6 cent/kg. Total labour costs per ton are higher in the more small-structured Southern regions (Baden-Württemberg, Bavaria) than in Northern regions. A comprehensive interpretation of these results however needs to take into account the regional differences in farm gate milk prices.

Figure 5.4 **Full costs per ton of milk for different German regions (Ø 2006-2008)**



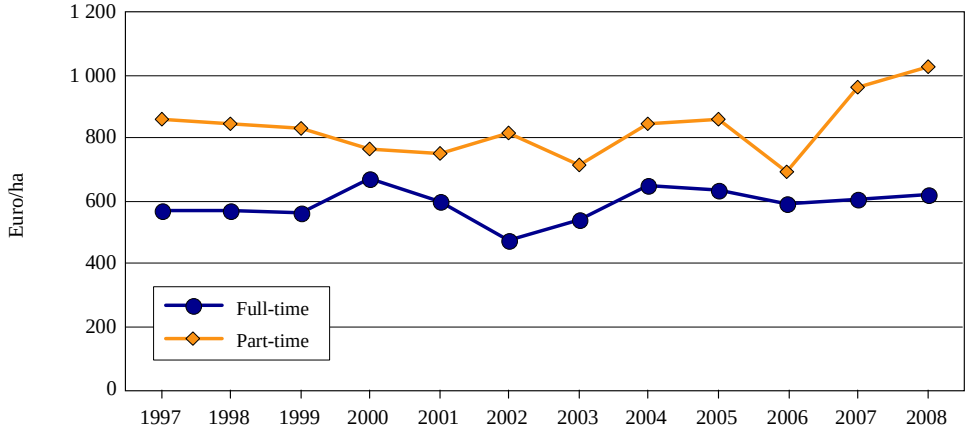
Source: German national FADN and own calculations.

Production costs for other differentiations

Further differentiations are made by land quality, part- and full-time farmers, legal forms, education of the farm manager and between specialised and non-specialised farms.

- Looking at the *land quality*, for wheat and milk no significant differences between different reference value classes was found. (No calculations for pigs were made, as there is no connection between soil quality and pig production.)
- For wheat, the model estimates revealed higher production costs (I) for *part-time* farmers than for full-time farmers for all years (Figure 5.5). This might be due to scale effects, as *full-time* farmers cultivate on average 139 ha UAA (utilised agricultural area), while part-time farms have on average only 27 ha UAA. For pigs the production costs (I) are also slightly higher for part-time farms, but for some they are almost equal. The same can be observed for milk.

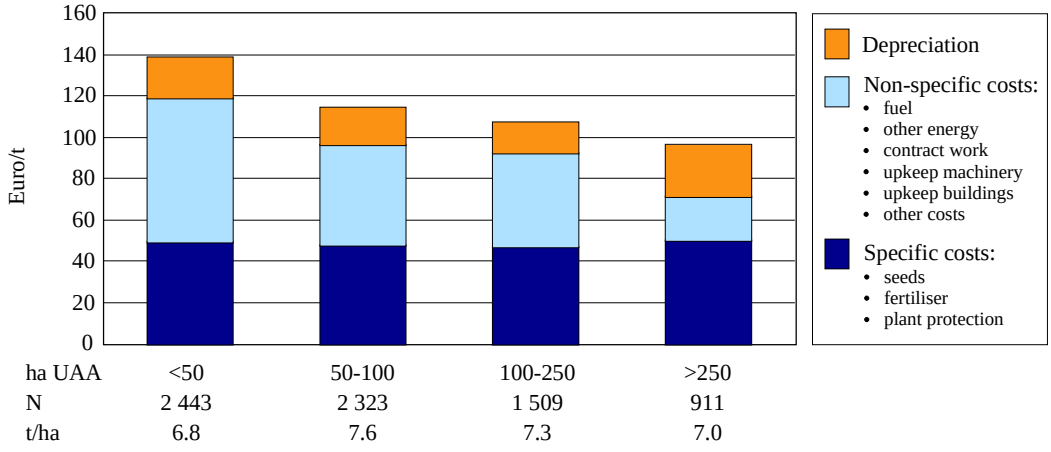
Figure 5.5 **Production costs (I) for wheat in full- and part-time farm, 1997-2008 a)**



a) Respective sample sizes in 2005: full-time farms 5 208: part-time farms 613.
Source: German national FADN and own calculations.

- For wheat, no clear ranking regarding the production costs (I) for different *legal forms* was observed, while for pigs, the production costs (I) are for most years the highest for private partnerships. The same can be seen for milk production, where private partnerships also have mostly the highest production costs (I) followed by individual farms, while the lowest production costs (I) can be found for legal entities.
- The results on the correlation between the cost of production and the *education of the farm manager* have to be regarded with caution. Although for pigs there is a high correlation between those two variables, it might only be due to size effects.
- Surprisingly, for all three products the production costs (I) of *specialised farms* are mostly higher than those for the average of all farms and for non-specialised farms.
- As in the area of livestock production, farms become more and more specialised with respect to the processing steps and the output produced, special emphasis is also put on the *costs of beef and pig production*. Estimations were differentiated between bull fattening farms and specialised suckler cow farms, and between pig fattening and piglet production, respectively. It can be seen that specialised bull fattening farms have a higher cost and return level than the results for total beef production. Costs are covered by market returns only until 1998 and in 2005 and 2007. The cost development of specialised suckler cow farms coincides with that of the bull fattening farms. After decoupling the remaining Pillar-2 payments are on a level of €150/LU, which is higher than the net value added, and the profitability of suckler cow production is to a large part depending on Pillar-2 payments. A specific analysis of farms specialised in pig fattening farms highlights the influence of varying piglet prices for total production costs, and reflected the strong rise of the price for feeding stuff during the last two years analysed.
- The *size of the farm* area also plays an important role in the level of the production costs (I). Farmed with an UAA smaller than 50 ha have the highest level of wheat production costs (I), which continuously decrease with farm size (Figure 5.6). For milk, scale effects were taken into account by differentiating by dairy herd size. Here, the production costs (I) also decrease with increasing herd size, except for farms with more than 200 cows, where the production costs (I) rise again slightly.

Figure 5.6 **Production costs (I) for wheat by size of farm area (Ø 2006-2008)**



Source: German national FADN and own calculations.

5.4 Discussion

For the main agricultural products (e.g. wheat, pig and milk) the quality and plausibility of results derived from the SUR estimation are generally satisfying. Estimated total costs are in the expected range, and also the cost structure seems generally plausible. However, for 'minor' products, the results are

often rather implausible, including many negative coefficients, and unrealistic level of individual cost components.

Numerous data and methodological problems were encountered during the estimations:

- Obviously, the assumption of a common *Leontief-technology* can be challenged on theoretical as well as empirical grounds.
- The SUR method allows for *negative coefficients*, which are in this respect rather implausible and can't be really interpreted.
- Another problematic issue is the *multi-collinearity* between the output of certain products, e.g. wheat and barley.
- A strong impact on the results was also found for *outliers*. The identification of outliers is particularly difficult due to the high number of interconnected variables. First attempts have been made to eliminate outliers prior to estimation, leading to improved results. However, the implementation of outlier identification still poses challenges, as the share of farms excluded was rather high, and the related process intransparent.
- The FADN data is generally compiled for *tax purposes* and may be influenced by related considerations and may therefore not appropriately reflect the production economic relationships.

Based on theses experiences, it can be concluded that the quest for '*one generic model for all FADN samples and products*' will remain a challenge, as each issue has to be treated differently and the model has to be adjusted accordingly.

One possibility to overcome some of these problems is the use of entropy-based estimators, which prevent negative coefficients and allow the inclusion of a-priori-information. Nevertheless, the data- and theory-inherent problems remain. Some good results could be achieved already, nevertheless further research in this area is necessary.

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5.6 Appendix

BB	Brandenburg
BW	Baden-Württemberg
BY	Bavaria
HE	Hesse
MV	Mecklenburg-West Pomerania
NI	Lower Saxony
NW	North Rhine-Westfalia
RS	Rhineland-Palatinate + Saarland
ST	Saxony-Anhalt
SH	Schleswig-Holstein
SN	Saxony
TH	Thuringia

6 Agricultural efficiency at the farm level

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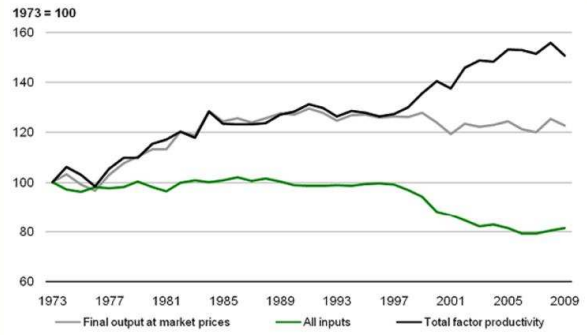
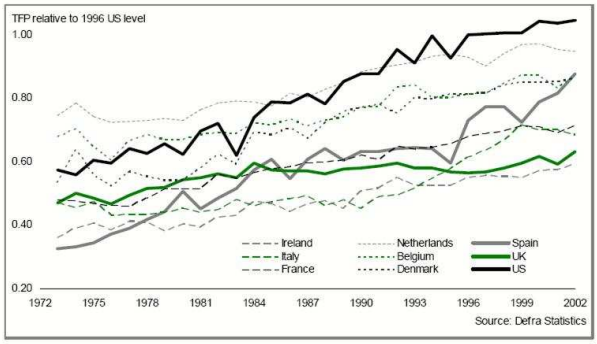
Defra, Department for Environment Food and Rural Affairs

looked at in isolation, UK farming's productivity record seems reasonable....

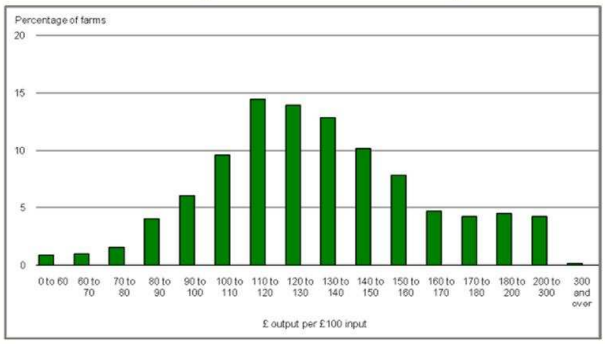


.....but compared with other countries UK's overall performance has been pretty lacklustre.....



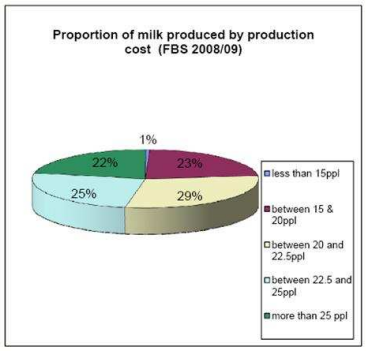
And there is enormous variation in performance amongst farms.....

.....as shown by the Farm Business Survey for 2008/09



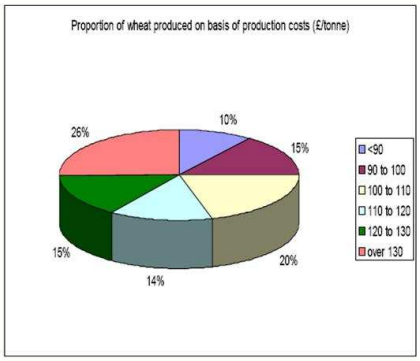
Taking dairying as an example……..

- FBS shows large variation in performance.
- Average milk price received was just over 26½ ppl in 2008/09.
- Production costs for milk ranged from 14 pence to over 45 ppl.
- With less than 25% produced at below 20ppl;
- And over 20% produced at above 25ppl



Similarly with cereals……..

- In 2008/9, average wheat price received was £116/tonne.
- 45% of wheat was produced at less than £110/tonne but;
- Over 40% of wheat cost more than £120/tonne to produce.



So what drives productivity?

- **Enterprise**
- **Innovation**
- **Competition**
- **Investment (*Physical capital)***
- **Skills (*Human capital)***

But, in order to progress, we need better to understand.....

- Why some farms perform much better than others;
- How far relevant practices and behaviours can be adopted – or adapted – by lower performing farms.

To explore these issues a project was commissioned from the Scottish Agricultural College (SAC)

Scottish Agricultural College (SAC) project aims to....

- Use FADN data to compare efficiency between farm types and EU countries and;
- Identify characteristics of farms on the 'efficient frontier'.

Methods

• Stochastic Production Frontiers
– one-stage inefficiency effects model
– translog production function

• 'Metafrontier' Analysis
– Battese et al (2004)

• Stability Analysis
– panels of top and low performers

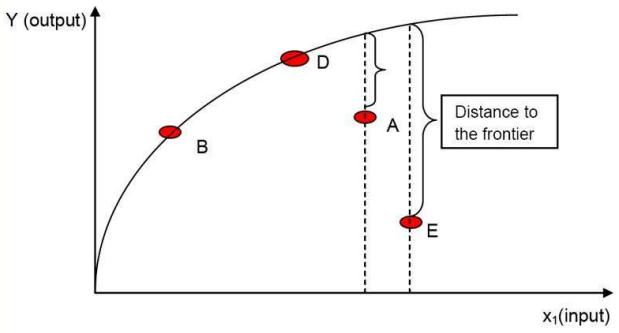
- The stochastic production frontier technique is a popular approach for agricultural economists to measure technical efficiency at farm-level.
- The credibility of the results was tested by drawing on expert opinion and farm management studies.
- New field of investigation - care in interpreting the results. Preliminary estimates to aid discussion.

FADN Data used

Variable	Description
OUTPUT	The value of main output less subsidies. Subsidies were removed from outputs due to the fact that they inflate artificially the output without increasing the inputs. In addition, this also provides consistency over the post-2004 period, when payments were decoupled from activity.
MATERIALS	This comprises all variable costs aside from energy used on the farm enterprises. For cropping farms these include cost of fertilizers, seeds, crop protection and other costs, for livestock these include cost of feed, veterinary and medicine as well as other costs.
ENERGY	Total cost of energy consumed on the farm, comprising fuel and oil, and electricity
LAND	Total area used for agricultural production
LABOUR	Total hours of labour paid and unpaid in hours
CAPITAL	Constructed to represent the flow of services, taking running and maintenance costs, depreciation and interest of capital stock (taken at 3% p.a)
TIME TREND	An integer representing technical change (where 1 is first year to N years)

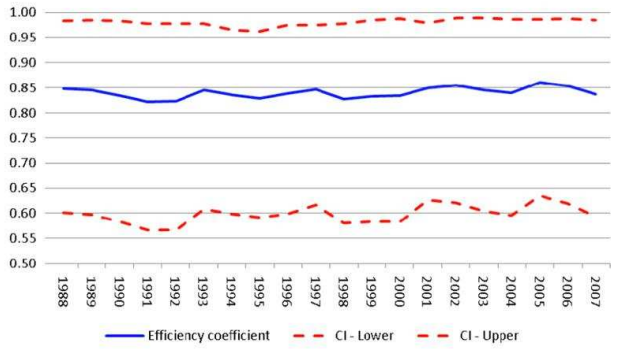
- These were deflated using Country-specific deflators.
- The deflators enabled conversion of values into quantities of outputs and inputs, i.e. for measuring technical efficiency.

Measuring technical efficiency and identifying the frontier of efficiency



- Mean technical efficiency shows closeness of the average farm to the frontier of efficiency,
- "Technical change" gives an indication of how the efficient frontier moves out, or falls back, year by year.
- In general the frontier can be seen to have expanded over the period of research, implying positive technical *change*.
- Technical 'growth' is where farms have moved closer to the frontier.
- The sectors to have seen most progress since 1989 are pigs, poultry, and dairy; all having average farms that have moved closer to their frontiers, *coupled with* positive technical change shown by advancing frontiers.

Cereal farms – mean technical efficiency relative to the frontier (England and Wales)



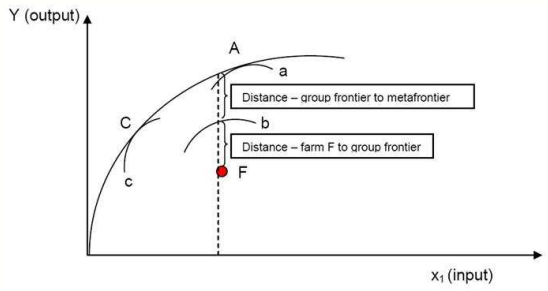
Cereal farms (England and Wales)

• Average T.E. 89-2008	84%
• Returns to scale	Increasing
• Average frontier movement	- 1.1%
• Average farm movement relative to the frontier	- 0.09%
• Stability Analysis	60%

- Most farm types in England and Wales were found to have relatively high levels of mean technical efficiency,
- This implies that for each farm type, the average farm is operating at a level close to the best practice farms on the frontier of efficiency.
- The majority were found to have increasing returns to scale, so that in theory, a proportionate increase in the level of inputs would result in a more than proportionate increase in the level of output. An exception to this was dairy farms which were considered to be operating at optimal scale.

- In England and Wales the most significant characteristics of efficient farms varied by farm type, but the most efficient farms were generally found to be:-
  - those with higher levels of specialisation;
  - those with a greater amount of contracting;
  - larger farms;
  - those taking more risk (through higher ratios of borrowing to assets) ;
  - those with higher ratios of paid to unpaid labour.

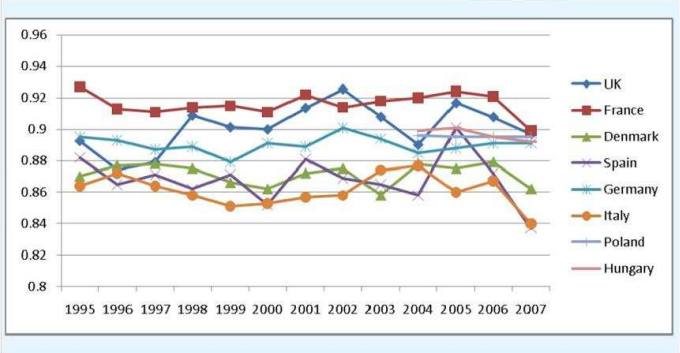
Constructing a Metafrontier (at EU level) for mean technical efficiency



- The next step in the research compared technical efficiencies across a number of selected countries within the EU.
- Separate Stochastic Production Frontiers are run to derive the frontiers and a farm (eg F) can be measured relative to its country's own frontier.
- However, different countries operate under different technological possiblities and therefore should be measured against a different frontier if comparisons are made across EU.
- The metafrontier is composed of EU wide technologies and therefore farm F can be measured relative to the metafrontier. For each farm type, in most EU regions there is at least one farm which is touching the metafrontier – indicating that it is, in theory, possible for farms in EU countries to improve technical efficiency to the leading level.

- As in E and W, for each farm type, most countries were seen to have high technical efficiencies relative to their own country's efficient frontier for that farm type.
- This was particularly the case for cereals and dairy.
- There are many caveats around comparisons across countries but the UK emerged with a reasonable standing; considered a leading country for cereals and for dairy.

EU FADN specialist cereals, oilseed and protein crops farms – technical efficiency relative to each country's frontier.



EU Metafrontiers (specialist cereals, oilseed and protein crops farms)

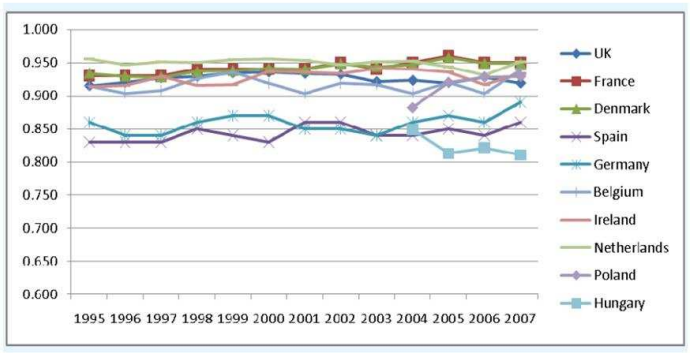
	Mean Technical Efficiency	Mean MTR	Mean MF
UK	0.900	0.773	0.696
France	0.916	0.550	0.504
Denmark	0.872	0.571	0.498
Spain	0.868	0.753	0.654
Germany	0.891	0.680	0.606
Italy	0.862	0.761	0.656
Poland	0.896	0.900	0.806
Hungary	0.897	0.724	0.649

- MTR = metatechnology ratio which indicates the gap between the group frontier and the metafrontier (increase in the ratio equals a decrease in the gap).

- In effect, the MTR takes the value of between 0 and 1, where 1 indicates no gap between the farm in a particular region and the metafrontier.

- The metafrontier (MF) is simply the TE * MTR for each farm.

EU FADN specialist dairy farms – technical efficiency relative to the EU metafrontier



EU Metafrontiers (specialist dairy farms)

	Mean TE	Mean MTR	Mean MF
UK	0.926	0.883	0.817
France	0.942	0.657	0.619
Denmark	0.942	0.625	0.589
Spain	0.843	0.732	0.617
Germany	0.858	0.769	0.660
Belgium	0.916	0.599	0.549
Ireland	0.928	0.513	0.476
Netherlands	0.949	0.603	0.572
Poland	0.915	0.925	0.846
Hungary	0.823	0.654	0.539

Key findings:

England and Wales Analysis

- In general the frontier can be seen to have expanded over the period of research.
- Most farm types have high levels of mean technical efficiency compared to the frontier.
- And majority have increasing returns to scale
- The two sectors to have seen most technical progress since 1989 are pigs and poultry, and dairy; both having average farms that have moved closer to their frontiers, coupled with positive technical change implied by advancing frontiers.
- Main drivers of efficiency: area, risk, higher waged to unpaid labour, specialisation, contracting.
- Mostly stable trends over time (confirmed in stability analysis)

Key findings (contd)

EU Analysis

- For each farm type, most countries show high mean levels of technical efficiencies relative to their own frontiers for that farm type.
- UK shows high technical efficiency relative to EU Metafrontier for cereals and dairying.
- UK has at least 1 farm on the Metafrontier in most types – indicating that in theory it is an achievable goal to reach the leading edge of EU technical efficiency.

Pointers from research methodology

- The need to construct consistent deflators for the FADN data - the national data is transformed into Euros in the FADN but the price indices to deflate seem to be kept in local currency .
- This is something that the EU can clarify (and could usefully calculate) because in the absence of physical units, with robust price indices one can estimate multiproduct cost functions (to measure cost efficiency) or distance functions (to measure technical efficiency).

Pointers learnt from methodology (contd)

- A major problem with using 'traditional' FADN-based approaches to measure efficiency, eg output per unit input, is that the information is at whole farm level, not by enterprise. Therefore data reflects several enterprises.
- Traditional methodologies therefore not very useful except for specialist farms, such as dairy or cereals farms, where a very high share of total farm output and income comes from only one enterprise.

Pointers learnt from methodology (contd)

- Data on crops are relatively easy to record but the data on livestock (physical movements from one category to other) is poorer (in the FADN it is not possible to follow the dynamics of the herds). Also, it is difficult to obtain true measures of performance such as calving rates, lambing rates, milk yields etc.
- There are therefore incentives to improve the econometric techniques and make them closer to the data available. For instance, exploration of techniques for measuring multi-output production systems.
- This would better reflect reality on mixed farming systems rather than assuming farms only produce one product.

SUMMARY

- Very wide range in productivity and economic performance.
- UK experience shows many farms still unaware of how their economic performance compares with their peers
- Research shows it is possible to identify the frontiers of efiiciency
- In most EU countries and for most farm types the average efficiency across farms is close to the frontier for that country.
- More work needs to be done to identify drivers of technical efficiency and characteristics of the most efficient farms.
- Implications for GHG emissions, - does good efficiency = good economic performance = good (low) GHG performance

7 A new typology for horticultural holdings in Flanders, Belgium

Nicole Taragola[1]
Sanne Bouters[2]
Ester Van Broekhoven[2]

7.1 Introduction

In the European Union there is a wide diversity of production structures and systems in agriculture and horticulture. To make it easier to analyse the structural and economic results of the agricultural and horticultural holdings, an appropriate classification per type of farming and economic size class has been developed by the European Commission.

Since 1985 this typology was based on standard gross margins (SGM), calculated taking into account the gross output and the subsidies, as well as certain deductible specific costs. In the meantime the common agricultural policy has drastically changed and the majority of the direct payments has been decoupled. Due to this decoupling of direct payments since 2005, it was not possible to maintain the previous typology (Commission decision 85/377/EEC) based on SGM. A SGM without subsidies could be negative and therefore cannot be used as classification criterion. Therefore, a new typology has been established, making use of the Standard Output (SO) instead of the SGM. The Standard Output (SO) of an agricultural or horticultural product (crop or livestock) is the average monetary value of the agricultural or horticultural output at farm-gate price, with the exclusion of direct payments, value added tax and taxes on products.

In Flanders horticulture is an important sector, which represents EUR1.3bn, or 30% of the production value of Flemish agricultural and horticultural products (Bernaerts et al., 2009). To analyse the structural and economic results of this sector in a meaningful way, it is necessary to dispose of a useful typology for horticultural holdings. Since the number of groups is rather limited in the typology established by the European Commission, a more detailed typology for horticultural holdings is used in Flanders. Due to the change from SGM to SO, this typology needs to be adapted. In this paper a new typology for horticultural holdings is presented.

7.2 The new European typology for horticultural holdings (European Commission, 2009)

7.2.1 Most important differences with the previous typology

In 1984 the European Commission presented a typology for agricultural and horticultural holdings based on the standard gross margins (SGM), calculated taking into account the gross output and the subsidies, as well as certain deductible specific costs (Commission Decision of 29 February 1984 amending Decision 74/463/EEC establishing a Community typology for agricultural holdings).

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Classification of holdings was based on their type of farming and economic size. The determination of these two elements was based on the SGM of the various types of agricultural production. The type of farming was determined on the basis of the relative importance of the individual activities (or 'enterprises') carried out by a given farm. The total SGM of a farm was calculated by multiplying its crop areas and livestock numbers by the appropriate SGM coefficient and adding up the thus obtained values for all activities on the farm.

The typology was arranged in a way that homogeneous groups of holdings can be assembled in a greater or lesser degree of aggregation. With regard to horticulture the EU typology made a distinction between horticultural and permanent crops. The horticultural crops included vegetables (including strawberries), flowers and ornamental plants, and several other crops, among which mushrooms. The permanent crops included fruit (excluding strawberries), nurseries, permanent crops under glass and other permanent crops.

An advantage of the European typology was that the type of each agricultural or horticultural holding could be defined in an unambiguous manner. Application of the EU typology on the data of the agricultural census of 15 May allowed to determine the composition of the population and the partitioning of the holdings according to size classes. This offered the possibility of reviewing the representativeness of the sample, and to weigh the results in a satisfactory manner, if needed.

However, due to the decoupling of direct payments since 2005, it was not possible to maintain the previous typology based on SGM. A SGM without subsidies could be negative and therefore cannot be used as classification criterion. Therefore, a new typology has been established, characterised by following innovations:

- Use of Standard Output (SO) instead of Standard Gross Margin (SGM);
- No reference to a balance of fodder; fodder crops which are fed to own animals are taken into account, which did not happen in the old typology;
- A 3-level 'type of farming' classification (instead of 4 levels in the previous one);
- Expression of the economic size of the holdings directly in Euro (instead of European size units in the previous one);
- Introduction of a new classification variable reflecting the importance of the other gainful activities (OGA) directly related to the holding.

7.2.2 Definitions and principles for calculating Standard Output (SO) coefficients

The SO of an agricultural product (crop or livestock) is the monetary value of the agricultural gross production at the farm gate price:[1]

- including sales, farm use, farm consumption and changes in stocks;
- including both the value of the principal and any secondary products. The principal product[2] is usually the one with the highest value; the other products are taken as secondary ones;
- excluding direct payments, value added tax and taxes on product:[3] no direct payments (coupled, decoupled and other payments) are to be taken into account when calculating SO.

The SO is a unit value: for each type of crop production it corresponds to one hectare,[4] and for livestock production it corresponds to one head of livestock.[5]

[1] The marketing (and transporting) expenditures are to be considered as costs and they are not deducted from the price to be used in the standard output calculation.

[2] For example the principal product of a dairy cow is the milk; the values of the calf and the cow meat are secondary products.

[3] No compensation from a private company in case of bad weather for example, or from the state in case of animal health problem is to be taken into account. The SO coefficient should correspond to the output expected in 'normal' conditions. If in a year the whole MS is concerned by an epizooty (like the blue tongue), this abnormal year may be excluded from the calculation for the products concerned.

[4] Or 1 are in the case of mushrooms and forcing of witloof chicory.

[5] Or 100 heads in the case of poultry; or one hive in the case of bees.

The data used to calculate a SO cover a twelve-month production period. If the period of production for crops and livestock is other than twelve months, the figure should be converted into values relating to a period of twelve consecutive months.

The SO coefficients are calculated for each cultivation and livestock characteristic in the Farm Structure Survey (FSS). The characteristics of the FSS are defined in EG regulation 1166/2008.

In order to smooth out the effects of short-term fluctuations, which may be considerable in horticulture, the SO coefficients are calculated as an average over a reference period covering five successive years. For a FSS year N, the SO coefficients for the reference period N-3 are applied, calculated as the average of year N-5 to year N-1. Therefore for FSS 2010, the SO '2007' coefficients will be applied, calculated as an average of 2005-2009.

The SO '2004' are the first average SO coefficients calculated for the Flemish region. Exceptionally, these SO coefficients are calculated as an average of only three years (2003-2005) (D'Hooghe, J. & Campens, V., 2009). The SGM are also calculated for the last time over the same time period in order to make a comparison. The typology of the agricultural holdings in the FSS 2007 is calculated on the basis of both SGM '2004' and SO '2004'.

The SO for horticulture is calculated by following formula:

SO (€/ha) = (external sales + internal sales + stock changes + closing stock 'not harvested' - beginning stock 'not harvested' + sales secondary products)/surface(ha)

In the above-mentioned formula the closing and beginning stocks 'not harvested' are equal to the non harvested crops which are still present on the cultivation surface. The surface in the formula is the surface really occupied by a cultivation, this for cultivations which occupy a plot during the complete year. For cultivations which do not occupy a plot during a whole year, the outputs of the main crops and successive crops are divided by the plot's surface. When the successive crops are of equal economic importance, which is often the case in horticulture, the surface which is taken into account is based on the period during which the cultivation occupies the plot (e.g. for a 4 month cultivation of lettuce on a 9-are plot, a surface of 3 are will be taken into account). These adjusted surfaces are called 'basic surfaces'.

The calculation of the SO coefficients for the different horticultural crops in the FSS is based on FADN data and data from fruit and vegetable auctions. A separate SO coefficient is determined for each horticultural crop in the FSS when enough data are available. On the basis of these individual SO coefficients a weighted average of the SO for each group of horticultural crops in the FSS is calculated, based on the surface of each horticultural crop belonging to the group. This weighted average is also applied for horticultural crops when not enough data are available for calculation of the SO.

7.2.3 Firm types

In Table A7.1 in the appendix, the classification according to the new EU horticultural typology, for the holdings specialised in horticulture, permanent crops and mixed cropping, is presented in bold letter type. The codes P1, P2 and P3 in the schematic overview are respectively the total SO of general crops, horticultural crops and permanent crops of a holding. The extensive horticultural crops (new FSS-code 2.01.07.01.01) are considered as general crops. The horticultural crops are:

- fresh vegetables, melons and strawberries, which are outdoors or under low (not accessible) protective cover (horticultural/intensive cultivation) (2.01.07.01.02);
- fresh vegetables, melons and strawberries under glass or other (accessible) protective cover (2.01.07.02);
- flowers and ornamental plants (excluding nurseries, including bulb cultivation), which are outdoors or under low (not accessible) protective cover (2.01.08.01);
- flowers and ornamental plants (excluding nurseries) under glass or other (accessible) protective cover (2.01.08.02);
- mushrooms (2.06.01);

- nurseries (2.04.05).

For Flanders P3 is the sum of the SO of:
- orchards and small fruit (fruit trees and berries) (2.04.01);
- other multiannual crops (2.04.06);
- permanent crops under glass (2.04.07).

Citrus fruit, olives and wine grapes are not cultivated in Flanders. Table grapes are classified in Flanders as permanent crops under glass (2.04.07), together with berries and other small fruit, excluding strawberries.

Comparing the new with the old European typology shows that basically there are little changes in the classification of the principal types of farming. However, in the category of the particular types of farming important changes can be observed. In the typology based on SGM, after the general type 'specialist horticulture', a separation was made in 'specialist vegetables', 'specialist flowers and ornamentals' and 'mixed horticulture'. Only then each of these principal types of farming was divided into 'outdoor cultivation', 'indoor cultivation' or a combination of both. In the new European typology the general type 'specialist horticulture' is first divided into 'outdoor cultivation' and 'indoor cultivation' and then split in the particular types 'vegetables', 'flowers and ornamental plants' or a combination of both.

In the old European typology based on SGM, nurseries belonged to the general farming type 3 'specialist permanent crops'. To be more specific, nurseries belonged to the principal farming type 'various permanent crops combined'. In the new European typology nurseries are categorised under the principal farming type 23 'other horticulture' and the particular farming type 232 'specialist nurseries'. Also the 'specialist mushrooms' and 'various horticulture' are categorised under this principal farming type.

The general farming type 'mixed cropping' (type 6) does not change in the new European typology.

7.2.4 Economic size

The economic size of a holding is equal to its total SO, measured in Euro. Each hectare or head of livestock present on the holding is multiplied by the corresponding SO coefficient, the given result for each activity is the individual SO of that activity. The economic size of the holding is the sum of the individual SOs. As mentioned before neither the subsidies nor the holding's other gainful activities are included in the economic size of the holding. The total economic size of the holding is therefore determined by its structure (number of hectares and animals) and by the SO coefficients applied in the region the holding belongs to. In other words, the economic size of a holding corresponds to the output a farmer can potentially expect to get from his/her land and livestock in a given region.

The holdings are classified according to their economic potential in 14 economic size classes (Table A7.2 in the appendix). The economic size classes are used:
- to establish the threshold defining the field of observation for the FADN. For the Flemish FADN this threshold is fixed at 25.000 Euro;
- to establish the selection plan of the holdings to be part of the FADN sample and, in consequence, to weigh the FADN results;
- to display the results of the holdings broken down by robust size classes at national or EU level. The robustness means that they are not sensitive to the kind of production of the farms.

7.3 The new Flemish typology for horticultural holdings

7.3.1 Methodology

The introduction of the EU typology in 1985 offered a lot of advantages, but this typology appeared inadequate for studying the Belgian horticulture sector. For this reason in 1986, a separate horticultural typology was established by Van Lierde (1986), which is presented in Table A7.3 in the appendix. Due to the establishment of a new European typology, making use of Standard Outputs (SO) instead of Standard Gross Margins (SGM), this horticultural typology needs to be adapted. In contrast to the existing horticultural typology the new Flemish horticultural typology is an extension of the European typology.

At the drawing up of the new Flemish typology, we examined which horticultural crops are important in Flanders at this moment. The importance of the different horticultural cultivations has changed since the development of the horticultural typology in 1986. For example, in the previous Flemish horticultural typology there is a separate category for begonia companies, which are now much less important than they were in 1986. To determine which cultivations are currently important enough to have their own specialised holding type, we started by examining the average area taken by the cultivation in Flanders during the period 2003-2007. Also the total area of each cultivation in Belgium during this period was examined. However, a cultivation with a large area is not always a cultivation with a large turnover or a high production value. For this reason, besides the area, also the total SO of each cultivation was calculated, by multiplying the average area by the corresponding SO '2004'-coefficient. Special attention was paid to the typical Flemish regional products, such as Belgian endive (witloof chicory) and azaleas.

7.3.2 The Belgian endive (witloof chicory) problem

At the drawing up of the new Flemish horticultural typology on the basis of SO, we were faced with a classification problem of the companies which are forcing witloof chicory. In the previous horticultural typology it was decided to split the cultivation of witloof chicory roots in intensive and extensive cultivation. Extensive cultivation comprised the witloof chicory roots which are sold by the holding where they are cultivated. For all clarity, this means that these roots are not forced on the holdings where they are cultivated. This cultivation, which often takes place in alternation with agricultural cultivations, was entirely considered as a field crop. Intensive cultivation of witloof chicory roots comprised the witloof chicory roots which are forced after the harvest (either with or without preservation) on the same holding where they were grown. These roots, which are often grown in alternation with horticultural cultivations, were considered a horticultural cultivation. So, in fact the difference between extensive and intensive witloof chicory roots was not originating from the method of cultivation but from the destination.

An SGM was calculated for extensive and intensive cultivation of witloof chicory roots, but not for forcing the witloof chicory roots. The SGM of extensive cultivation of witloof chicory roots was calculated as the gross output of the roots diminished with the specific costs of the root production, divided by the surface of the root production. The SGM of intensive cultivation of witloof chicory roots was calculated as the gross output of the 'witloof' diminished with the specific costs of the root and witloof production, divided by the surface of the root production. When calculating the economic size and type of the holding the surface needed for forcing the witloof chicory roots was not taken into account. It was assumed that all the holdings which force witloof chicory roots also cultivate their own witloof chicory roots. Indeed, this was the case when the first horticultural typology was established. However, due to the development of hydroponic cultivation of witloof chicory, more and more holdings started to buy witloof chicory roots and specialised in witloof production. According to the agricultural census in 2007 61 holdings were forcing witloof chicory without having an own production of witloof chicory roots. When their economic size is calculated on based on the SGM, the forcing of witloof chicory roots will not be taken into account, resulting in an economic size of 0 Euro.

In order to typify and classify the holdings which force witloof chicory roots in an univocal manner, it was decided to create a new firm type within the new horticultural typology for Flanders. This firm type

would include holdings forcing witloof chicory roots which are not cultivated by themselves, but which are bought from other firms specialised in the production of witloof chicory roots. First, it was decided where this new firm type would be added in the structure of the new horticultural typology. Hydroponic cultivation of witloof chicory shows some similarities with production of mushrooms (multi-layer system). However, the European Union defined only a firm type for specialist mushrooms (231 'specialist mushrooms'). Our primary concern at drawing up the new Flemish horticultural typology was that it would be an extension of the European typology. However, by adding a new firm type at the same level as the European type 231 'specialist mushrooms', the structure of the Flemish horticultural typology would no longer be an extension of the European typology. For this reason the firm type 'specialist vegetables witloof chicory forcing' was created as a sub type of 'specialist vegetables indoor', including vegetables under glass or other accessible protective cover. Moreover, the SO coefficient for forcing witloof chicory roots is approximately equal to the SO coefficient of the other indoor vegetables.

Also the classification of the witloof chicory roots was reviewed. Since an SO coefficient was introduced for forcing witloof chicory roots, a difference between intensive and extensive cultivation of witloof chicory roots no longer exists.

Following 3 possibilities were considered:

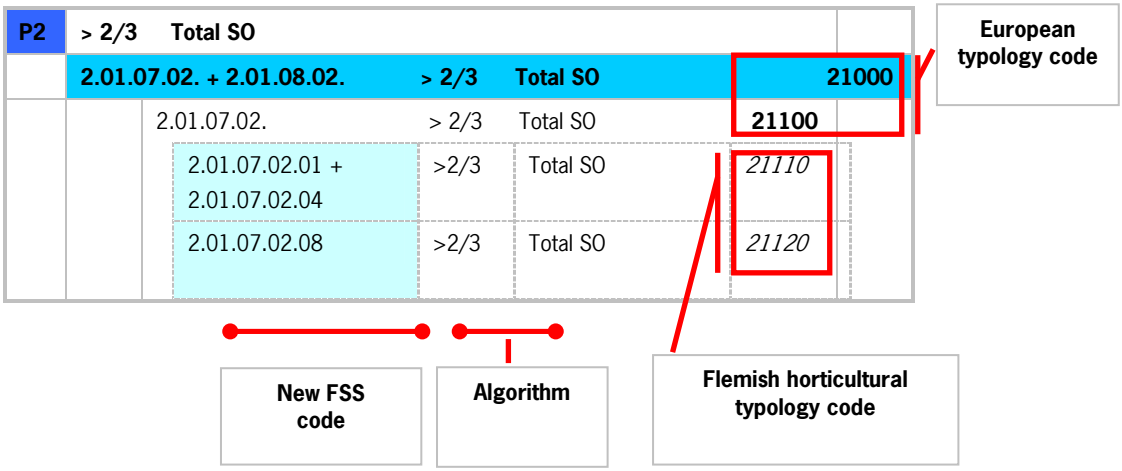
1. All witloof chicory roots, both grown in alternation with agriculture or horticulture cultivations are considered as extensively grown outdoor vegetables. Witloof chicory root production is therefore entirely classified as agriculture.
2. All witloof chicory roots, both grown in alternation with agriculture or horticulture cultivations are considered as intensively grown outdoor vegetables. Witloof chicory root production is therefore entirely classified as horticulture.
3. Witloof chicory roots, grown at holdings without forcing of witloof chicory roots, are considered as extensively grown outdoor vegetables. Witloof chicory roots, grown at holdings with forcing of witloof, are considered as intensively grown outdoor vegetables. The SO coefficients of both groups are equal.

In the agricultural census 2007 there are 61 holdings that declare to force witloof chicory roots without having an own production of witloof chicory roots; 122 holdings declare to produce witloof chicory roots without forcing them; and 394 holdings are both producing and forcing witloof chicory roots. So, in total, 455 (61 + 394) holdings are forcing witloof chicory roots.

For the 577 holdings, mentioned above, the firm type was determined for each of the three possibilities. Comparing the three options with each other shows that there are always 484 holdings that move within the general types of farming 1, 2, 3 and 6. Option 2 and 3 have both 58 mixed holdings (type '6****'). In option 1 we can find one holding with two thirds of its total SO originating from outdoor vegetables. Also in option 3 we can localise these companies specialised in field crops which grow exclusively witloof chicory roots (type '16300'). At the options 2 and 3 holdings with more than two thirds of their SO originating from both producing and forcing witloof chicory roots are classified as 'specialist horticulture'. This gives a more correct classification than at option 1. Because option 3 corresponds better to the previous typology in several respects this option was chosen. So, the intensively and extensively witloof chicory roots each get separate SO coefficients with exactly the same value.

7.3.3 Results

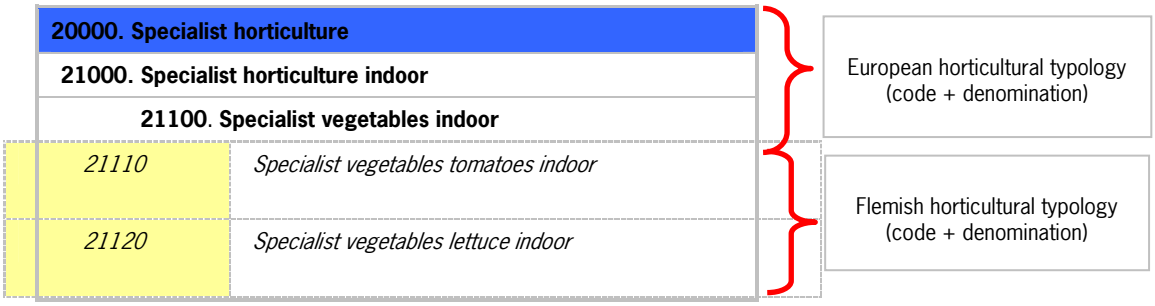
In Table A7.1 in the appendix the new Flemish horticultural typology is presented, together with the algorithm for the classification of the horticultural holdings.



The left side of the first column in the table describes for which (new) FSS code the contribution must be larger than two thirds of the total SO of a holding. If this condition is met, the holding gets the associated five-digits typology code (in bold). If the horticultural typology code is framed by a dotted line then this code is specific for Flanders.

The second column reflects the denomination and the code for each firm type of the horticultural typology. If the last two digits of the five-digits typology code are zeros, then the code is of European origin. If this is not the case, then it is a Flemish horticultural typology code.

From the table it becomes clear that the Flemish horticultural typology is an extension of the new European horticultural typology. To be able to make a clear distinction, the Flemish code is once more indicated in yellow colour (to see example mentioned below).



In order to get insight into the shift of the companies from the previous horticultural typology within the new horticultural typology, Table A7.4 in the appendix was established. In the table the distribution of the number of holdings according to the old and new Flemish horticultural typology (FSS, 2007) is presented. In the table certain boxes are coloured in yellow; these are the boxes in which one can expect that the companies from the old horticultural typology will arrive in the new horticultural typology. For example, one will expect that holdings of the type 'specialist vegetables indoor (2200)' in the old horticultural typology will arrive under the different new horticultural types 'specialist vegetables tomatoes indoor (21110)', 'specialist vegetables lettuce indoor (21120)', 'specialist vegetables sweet peppers indoor (21140)', 'specialist vegetables cucumbers indoor (21150)' and 'other specialist vegetables indoor (21190)'. It is notable that a number of holdings belonging to the old horticultural type 'specialist other vegetables (2400)' arrive under the type 'specialist vegetables indoor 21100' in the new horticultural (and European) typology. The shift of the 109 holdings (red coloured box) is entirely attributed to the new type that was added in the new Flemish horticultural typology 'specialist vegetables witloof chicory forcing (21160)'.

7.4 References

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7.5 Appendix

Table A7.1	Algorithm for the classification of the horticultural holdings by type of firm in the new EU-typology (in bold) and in the new Flemish horticultural typology *(in italic)*					
P 2	**> 2/3**	**Total SO**			**20000. Specialist horticulture**	
	2.01.07.02. + 2.01.08.02.	**> 2/3**	**Total SO**	**21000**	**21000. Specialist horticulture indoor**	
	2.01.07.02.	> 2/3	Total SO	**21100**	**21100. Specialist vegetables indoor**	
	2.01.07.02.01 + 2.01.07.02.04	>2/3	Total SO	*21110*	*21110*	*Specialist vegetables tomatoes indoor*
	2.01.07.02.08	>2/3	Total SO	*21120*	*21120*	*Specialist vegetables lettuce indoor*
	2.01.07.02.02	>2/3	Total SO	*21130*	*21130*	*Specialist vegetables strawberries indoor*
	2.01.07.02.03	>2/3	Total SO	*21140*	*21140*	*Specialist vegetables sweet peppers indoor*
	2.01.07.02.05	>2/3	Total SO	*21150*	*21150*	*Specialist vegetables cucumbers indoor*
	2.01.07.02.19 + 2.01.07.02.20	>2/3	Total SO	*21160*	*21160*	*Specialist vegetables witloof chicory forcing*
	Other cases			*21190*	*21190*	*Other specialist vegetables indoor*
	2.01.08.02.	> 2/3	Total SO	**21200**	**21200. Specialist flowers and ornamentals indoor**	
	2.01.08.02.01	>2/3	Total SO	*21210*	*21210*	*Specialist azaleas indoor*
	2.01.08.02.03	>2/3	Total SO	*21220*	*21220*	*Specialist cut flowers indoor*
	2.01.08.02.04	>2/3	Total SO	*21230*	*21230*	*Specialist bedding and balcony plants indoor*
	2.01.08.02.05	>2/3	Total SO	*21240*	*21240*	*Specialist pot plants indoor*
	Other cases	>2/3	Total SO	*21290*	*21290*	*Other specialist flowers and ornamentals indoor*
	Other cases			**21300**	**21300. Mixed horticulture indoor specialist**	

Table A7.1 **Algorithm for the classification of the horticultural holdings by type of firm in the new EU-typology (in bold) and in the new Flemish horticultural typology *(in italic)***

	2.01.07.01.02. + 2.01.08.01. > 2/3 Total SO			**22000**			**22000. Specialist horticulture outdoor**	
	2.01.07.01.02	> 2/3	Total SO	**22100**	221. Gespecialiseerde opengrondsgroenten-bedrijven	211. Specialist vegetables indoor	**22100. Specialist vegetables outdoor**	
	2.01.07.01.02.08	>2/3	Total SO	*22110*			*22110*	*Specialist vegetables witloof chicory roots outdoor*
	2.01.07.01.02.20	>2/3	Total SO	*22120*			*22120*	*Specialist vegetables leek outdoor*
	2.01.07.01.02.21	>2/3	Total SO	*22130*			*22130*	*Specialist vegetables cabbage outdoor*
	2.01.07.01.02.26	>2/3	Total SO	*22140*			*22140*	*Specialist vegetables strawberries outdoor*
	Other cases			*22190*			*22190*	*Other specialist vegetables outdoor*
P 2	**> 2/3 Total SO**						**20000. Specialist horticulture**	
	2.01.08.01	> 2/3	Total SO	**22200**		212. Specialist flowers and ornamentals indoor	**22200. Specialist flowers and ornamentals outdoor**	
	2.01.08.01.01	>2/3	Total SO	*22210*			*22210*	*Specialist azaleas outdoor*
	2.01.08.01.05	>2/3	Total SO	*22220*			*22220*	*Specialist pot plants outdoor*
	Other cases			*22290*			*22290*	*Other specialist flowers and ornamental plants outdoor*

Table A7.1 **Algorithm for the classification of the horticultural holdings by type of firm in the new EU-typology (in bold) and in the new Flemish horticultural typology *(in italic)***

		Other cases			**22300**		213. Mixed indoor specialist	**22300. Mixed horticulture outdoor specialist**
P 2	**> 2/3**	**Total SO**						**20000. Specialist horticulture**
	2.01.07.02. + 2.01.08.02. ≤ 2/3 Total SO EN 2.01.07.01.02. + 2.01.08.01. ≤ 2/3 Total SO				**23000**			**23000. Other horticulture**
		2.06.01.	> 2/3	Total SO	**23100**			**23100. Specialist mushrooms**
		2.04.05.	> 2/3	Total SO	**23200**			**23200. Specialist nurseries**
		2.04.05.01	>2/3	Total SO	*23210*			*23210* *Specialist nurseries outdoor*
		2.04.05.01.01	>2/3	Total SO	*23211*			*23211* *Specialist nurseries ornamental plants outdoor*
		Other cases	>2/3	Total SO	*23219*			*23219* *Other specialist nurseries outdoor*
		2.04.05.02	>2/3	Total SO	*23220*			*23220* *Specialist nurseries indoor*
		Other cases			*23290*			*23290* *Other specialist nurseries*
		Other cases			**23300**			**23300. Various horticulture**
		2.01.07.01.02.26+ 2.01.07.02.02	>2/3	Total SO	*23310*			*23310* *Specialist vegetables strawberries outdoor and indoor*
		2.01.07.02.19 + 2.01.07.01.02.08	>2/3	Total SO	*23320*			*23320* *Specialist vegetables witloof chicory roots and forcing outdoor and indoor*

Table A7.1	Algorithm for the classification of the horticultural holdings by type of firm in the new EU-typology (in bold) and in the new Flemish horticultural typology *(in italic)*							
		2.01.07.02 + 2.01.07.01.02	>2/3	Total SO	*23330*			*23330* *Specialist other vegetables outdoor and indoor*
		2.01.08.02.01 + 2.01.08.01.01	>2/3	Total SO	*23340*			*23340* *Specialist azaleas outdoor and indoor*
		2.01.08.02.03 + 2.01.08.01.03	>2/3	Total SO	*23350*			*23350* *Specialist cut flowers outdoor and indoor*
		2.01.08.02.04 + 2.01.08.01.04	>2/3	Total SO	*23360*			*23360* *Specialist bedding and balcony plants outdoor and indoor*
		2.01.08.02.05 + 2.01.08.01.05	>2/3	Total SO	*23370*			*23370* *Specialist pot plants outdoor and indoor*
		2.01.08.02 +2.01.08.01	>2/3	Total SO	*23380*			*23380* *Specialist other flowers and ornamental plants outdoor and indoor*
		Other cases	>2/3	Total SO	*23390*			*23390* *Other horticulture outdoor and indoor*
P 3	**> 2/3 Total SO**						**3000. Specialist permanent crops**	
	2.04.04.		**> 2/3**	**Total SO**	**35000**		**35000. Specialist vineyards**	
		2.04.04.01.	> 2/3	Total SO	**35100**	351. Gespecialiseerde wijnbouwbedrijven - kwaliteitswijn	**35100. Specialist quality wine**	

Table A7.1	Algorithm for the classification of the horticultural holdings by type of firm in the new EU-typology (in bold) and in the new Flemish horticultural typology *(in italic)*						
		2.04.04.02.	> 2/3	Total SO	**35200**	352. Gespecialiseerde wijnbouwbedrijven - andere wijn dan kwaliteitswijn	**35200. Specialist wine other than quality wine**
	2.04.04.		**> 2/3**	**Total SO**	**35000**		**35000. Specialist vineyards**
		2.04.04.03.	> 2/3	Total SO	**35300**	353. Gespecialiseerde bedrijven tafeldruiven	**35300. Specialist tables grapes**
		Other cases			**35400**	354. Andere bedrijven wijnbouw en druiventeelt	**35400. Other vineyards**
	2.04.01. + 2.04.02.		**> 2/3**	**Total SO**	**36000**		**36000. Specialist fruit and citrus fruit**

Table A7.1	Algorithm for the classification of the horticultural holdings by type of firm in the new EU-typology (in bold) and in the new Flemish horticultural typology *(in italic)*

		2.04.01.01.01. + 2.04.01.02.> 2/3 Total SO **36100**						**36100. Specialist fruit (other than citrus, tropical fruits or nuts)**
		2.04.01.01.01.01	>2/3	Total SO	*36110*			*36110* *Specialist pip fruit*
		2.04.01.01.01.01.01	>2/3	Total SO	*36111*			*36111* *Specialist pip fruit apples*
		2.04.01.01.01.01.02	>2/3	Total SO	*36112*			*36112* *Specialist pip fruit pears*
		2.04.01.01.01.01.01 + 2.04.01.01.01.01.02	>2/3	Total SO	*36113*			*36113* *Specialist pip fruit combination apples and pears*
		2.04.01.01.01.03	>2/3	Total SO	*36120*			*36120* *Specialist small fruit and berries*
		Other cases	>2/3	Total SO	*36190*			*36190* *Other specialist fruit*
		2.04.02.	> 2/3	Total SO	**36200**			**36200. Specialist citrus fruit**
		2.04.01.03.	> 2/3	Total SO	**36300**			**36300. Specialist nuts**
		2.04.01.01.02.	> 2/3	Total SO	**36400**			**36400. Specialist tropical fruits**
		Other cases			**36500**			**36500. Specialist fruit, citrus, tropical fruits and nuts: mixed production**
	2.04.03.		**> 2/3**	**Total SO**	**37000**			**37000. Specialist olives**
		2.04.03.	> 2/3	Total SO **37000**		370. Gespecialiseerde olijventeeltbedrijven		**37000**. Specialist olives
	Other cases				**38000**			**38000. Various permanent crops combined**

Table A7.1	Algorithm for the classification of the horticultural holdings by type of firm in the new EU-typology (in bold) and in the new Flemish horticultural typology *(in italic)*					
		Other cases		380. Bedrijven met diverse combinaties van blijvende teelten		**38000**. Various permanent crops combined
P 6	**(P1 + P2 + P3) > 2/3 Total SO**					**6000. Mixed cropping**
	AND {P1 ≤ □2/3 AND P2 ≤2/3 AND P3 ≤ 2/3 Total SO} 61000					**61000. Mixed cropping**
		P2 > 1/3 Total SO EN P3 > 1/3 Total SO **61100**				**61100.** Horticulture and permanent crops combined
		P2 > 1/3 Total SO EN P1 > 1/3 Total SO **61200**				**61200.** Horticulture and field crops combined
		P1 > 1/3 Total SO EN 2.04.04. > 1/3 Total SO	**61300**			**61300.** Field crops and vineyards combined
		P1 > 1/3 Total SO EN P3 > 1/3 Total SO EN 2.04.04. ≤ □1/3 Total SO	**61400**			**61400.** Field crops and permanent crops combined
		P1 > 1/3 Total SO EN P2 ≤ 1/3 Total SO EN P3 ≤ □1/3 Total SO	**61500**			**61500.** Mixed cropping, mainly field crops
		Other cases	**61600**			**61600.** Other mixed cropping

Table 7.2	European economic size classes
Size Class	**Limits in Euro**
I	less than 2,000
II	from 2,000 to less than 4,000
III	from 4,000 to less than 8,000
IV	from 8,000 to less than 15,000
V	from 15,000 to less than 25,000
VI	from 25,000 to less than 50,000
VII	from 50,000 to less than 100,000
VIII	from 100,000 to less than 250,000
IX	from 250,000 to less than 500,000
X	from 500,000 to less than 750,000
XI	from 750,000 to less than 1,000,000
XII	from 1,000,000 to less than 1,500,000
XIII	from 1,500,000 to less than 3,000,000
XIV	3,000,000 or more

Table 7.3	Algorithm for the classification of the horticultural holdings by type of firm in the old Flemish horticultural typology (based on SGM)		
Algorithm		**Firm type**	**Typology code**
HORTICULTURE > 2/3 total SGM	→	**specialist horticulture**	
In all other cases : non-horticulture (Code EU-typology)			
VEGETABLES + STRAWBERRIES > 2/3 tot. SGM	→	**specialist vegetables**	
STRAWBERRIES > 1/2 tot. SGM	→	specialist strawberries	(type **2100**)
VEGETABLES INDOOR + STRAWBERRIES INDOOR > 9/10 tot. SGM	→	specialist vegetables indoor	(type **2200**)
VEGETABLES INDOOR + STRAWBERRIES INDOOR > 1/2 tot. SGM	→	other vegetables indoor	(type **2300**)
In all other cases : other specialist vegetables			(type **2400**)
FLOWERS > 2/3 tot. SGM	→	**specialist flowers and ornamentals**	
POT PLANTS > ½ tot. SGM	→	specialist pot plants	(type **3100**)
AZALEA > ½ tot. SGM	→	specialist azaleas	(type **3200**)
BEGONIA > ½ tot. SGM	→	specialist begonias	(type **3300**)
CUT FLOWERS > ½ tot. SGM	→	specialist cut flowers	(type **3400**)
In all other cases : other specialist flowers and ornamentals			(type **3500**)
PERMANENT CROPS > 2/3 tot. SGM	→	**specialist permanent crops**	
FRUIT > 2/3 tot. SGM	→	specialist fruit	(type **4100**)
NURSERIES > 2/3 tot. SGM	→	specialist nurseries	(type **4200**)
In all other cases : other specialist permanent crops			(type **4300**)
MUSHROOMS > 2/3 tot. SGM	→	**specialist mushrooms**	(type **1000**)
In all other cases: **VEGETABLES + FLOWERS + PERMANENT + MUSHROOMS** > 2/3 tot. SGM ➔ **other specialist horticulture**			(type **5000**)

Table 7.4	Distribution of the number of holdings according to the old and new Flemish horticultural typology

		Old Flemish typology on the basis of SGM														
		1000	2100	2200	2300	2400	3100	3200	3300	3400	3500	4100	4200	4300	5000	Total
New Flemish typology on the basis of SO	21110		2	293	16											311
	21120		1	197	43											241
	21130		201													201
	21140			41	1											42
	21150			34	6											40
	21160		3		1	109									1	114
	21190		11	203	129	5										348
	21210							31								31
	21220									117						117
	21230									3	207					210
	21240						131									131
	21290						70	2	5	8	33					118
	21300				3		3				5				16	27
	22120					77										77
	22130					63										63
	22140		76													76
	22190		13			335										348
	22210							20								20
	22220										54				1	55
	22290							1	21	27	28					77
	22300									1	1				3	5
	23100	57														57
	23211												371		4	375
	23219												95			95
	23220												14			14
	23290												19		1	20
	23310		93													93
	23320		1			13										14
	23330		10		61	89								1		161
	23340							91								91
	23350															0
	23360															0
	23370						10				5					15
	23380						17	2	11	22	60				4	116
	23390				2	2	2	1			1		5		75	88
	36111											169			2	171
	36112											261			1	262
	36113											427		1	10	438
	36120											56		2		58
	36190											216		1	9	226
	38000													77	3	80
	61100		15		4									2	54	75
	61290		2		1	9										12
	61600		13		1	8									26	48
	Total	57	441	768	268	710	233	148	37	178	394	1,129	504	84	210	5,161

8 Effects of the new typology: an analysis based on 2000 Agricultural Census data

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8.1 Introduction

Council Regulation (EC) 1242/2008 of December 2008 established the new Community typology for agricultural holdings that applies from FADN 2010, FSS 2010 and Agricultural Census 2010. According to this regulation new typology is based on the region, type of farming and economic size of Standard Output of the farm and represents an appropriate and homogenous classification of agricultural holdings. The type of farming of a holding is determined by the relative contribution of the Standard Output of the different characteristics of this holding to the total Standard Output. The classification proposed by the regulation has three levels of types of farming:

- 9 general types, including a type for non-classifiable holdings;
- 21 principal types;
- 62 particular types.

The use of the Standard Outputs instead of the Standard Gross Margin represents the real innovation compared to the previous regulations, indeed the type of farming and the economic size of the holding should be determined on the basis of an economic criterion remaining always positive. The Regulation (EC) 1242/2008 introduces also a new class on the importance of Other Gainful Activities (OGA) directly related to the holding in according to the increasing value that those activities have in the holding revenues. Other Gainful Activities are for example: agri-tourism, aquaculture, landscape maintenance and many other activities directly related to the holding and that frequently are differentiated in different countries. Aim of the analysis is to verify, through matrix of transition, the changes in the classification and the definition of farms, on the basis of 5th General Agricultural Census Data of 2000.

8.2 Methodology

In the analysis different sources are used, first of all the Agricultural Census, which is the principal archive on which we worked. The data are pretty old, in fact the last Agricultural Census data available are from 2000, but we chose to use them instead of other more recent surveys because only the Census covers the total of farms and also because the next Census will use new classification, so this study should be used to make comparisons between the two Censuses. So the choice was the result of two different reasons: the first, more theoretical, is that General Census is a total survey and the second, more practical, is that updating the General Census 2000 means to be able to compare the results of the old and the new Census, there is also another motivation linked to the regulation 1242 that establishes that the sample

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design of FADN 2010 is referred to new typology and to so. We also used other sources, for example Farm Structure Survey (FSS) 2007, on which we experimented the new classification and Standard Output and Standard Gross Margin of year 2004 that we utilised for that scope.

The studies imply the use of different variables: the Standard Output, the Type of farming and the Economic Size Unit (ESU). In particular for the Standard Output we used the 14 classes as established by the regulation 1242/2008 (plus 1 class for SO=0) and that starts from less than €2,000 till more than €3,000,000 as shown in the following table.

Table 8.1 Classes of Standard Output

Classes	Values in Euro
1	0
2	Less than 2,000
3	2,000-4,000
4	4,000-8,000
5	8,000-15,000
6	15,000-25,000
7	25,000-50,000
8	50,000-100,000
9	100,000-250,000
10	250,000-500,000
11	500,000-750,000
12	750,000-1,000,000
13	1,000,000-1,500,000
14	1,500,000-3,000,000
15	Equal or more than 3,000,000

About the Type of Farming we used nine general level groups and we chosen this level of aggregation to create matrix of transition easily to read. The groups are described in Table 8.2.

Table 8.2 Type of Farming

Groups	Type of Farming
1	Arable land
2	Horticulture
3	Permanent crops
4	Herbivores
5	Granivores
6	Polyculture
7	Breeding
8	Crops-Breeding
9	Unclassified

Finally last variable that we used is represented by classes of ESU, that was the criterion of classification calculated on the basis of the SGM. There are 11 classes of ESU (from less than 1 to more than 100 ESU).

Table 8.3	Classes of Economic Size Units
Classes	**Economic Size Units**
1	0
2	Less than 1
3	1-2
4	2-4
5	4-6
6	6-8
7	8-12
8	12-16
9	16-40
10	40-100
11	100 and more

For the level of spatial aggregation we chosen to make the analysis at national and regional level (NUTS2).

In a first step we construct the matrix of transitions at national level, but first of all we had to transform the old and new classes of variables, to make them comparable: we created classes of SGM similar to SO classes, in practical we just divided the SO for 1.200[1] and aggregated the values in classes as shown in Table 8.3.

8.3 Results at national level

The analysis should be divided into 3 phases: the first step was to look at the farms that stay in same position; the second step was to analyse how farms move from one class to another in terms of SO, SGM and typology; the third step was to cross the information and to consider the distribution of farms according to SO and type of farming.

First results are shown in Tables 8.4 and 8.5 that point out the number of farms that stay in the same class considered. In Table 8.4 the absolute values of farms are distributed by region and classified by SO, ESU and typology. The column indicates farm that do not change class of Standard Output going from old to new classification and the same applies to classes of ESU and type of farming.

[1] 1 ESU = €1,200.

Table 8.4	Number of Farms classified according to old and new classifications (absolute values)		
	Standard Output	**ESU**	**Type of farming**
Piemonte	60,899	54,071	81,143
Valle d'Aosta	3,872	3,309	3,393
Lombardia	37,721	37,347	56,239
Bolzano	5,092	6,302	19,413
Trento	15,379	15,116	19,704
Veneto	123,350	108,686	133,692
Friuli V.G.	23,838	21,909	27,224
Liguria	30,333	26,799	35,409
Emilia-Romagna	48,100	45,767	80,890
Toscana	92,599	82,559	102,539
Umbria	41,020	37,018	40,041
Marche	41,602	35,437	45,543
Lazio	132,704	104,636	168,002
Abruzzo	46,517	37,808	64,092
Molise	18,542	14,920	22,223
Campania	131,349	103,849	202,765
Puglia	251,320	224,702	326,770
Basilicata	55,069	48,055	58,863
Calabria	115,649	93,765	168,323
Sicilia	221,841	181,683	322,126
Sardegna	58,435	48,050	90,241

The main results show that the general situation is fairly stable in terms of Type of Farming, in fact in most cases more than 70% of farms are still in the same type group. In the case of ESU most regions change SO and ESU in 50% of the cases, but for few regions there are particular situations. For example in Valle d'Aosta is evident the great movement in the typology and in Bolzano Province change is very strong for standard output and ESU. At a glance the analysis highlights a general trend towards stability, especially with reference to typology, but it is also true that probably the old classification was not able to represent farm specialisation and furthermore there is no direct correspondence between changes in SO and changes in typology.

Table 8.5	Number of Farms classified according to old and new classifications (percentage values)		
	Standard Output	**ESU**	**Type of farming**
Piemonte	55	49	73
Valle d'Aosta	61	52	53
Lombardia	52	52	78
Bolzano	22	27	83
Trento	51	50	65
Veneto	66	58	72
Friuli V. G.	70	64	80
Liguria	71	63	83
Emilia-Romagna	45	43	76
Toscana	69	62	77
Umbria	73	66	71
Marche	64	54	70
Lazio	63	49	79
Abruzzo	57	46	78
Molise	55	45	67
Campania	54	43	83
Puglia	72	64	93
Basilicata	68	59	73
Calabria	60	48	87
Sicilia	61	50	89
Sardegna	53	44	82

In the second phase of the study we examined the transition matrices that show how farms move from a class to another. Results are shown in Tables 8.6, 8.7 and 8.8 where in the columns there are the new definitions of the variables considered and in the rows there are the old definitions. In Table 8.6 most changes are above the diagonal of the matrix and it is probably due to the definition of SO, in fact the SO value is usually higher than the SGM value.

Table 8.6	Distribution of farms classified according to Standard Output (%)															
Classes	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**Total**
1	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100
2	1	79	18	2	0	0	0	0	0	0	0	0	0	0	0	100
3	0	10	46	39	4	0	0	0	0	0	0	0	0	0	0	100
4	0	2	11	46	35	5	1	0	0	0	0	0	0	0	0	100
5	0	1	1	12	40	34	11	1	0	0	0	0	0	0	0	100
6	0	1	1	2	13	30	44	8	1	0	0	0	0	0	0	100
7	0	0	1	1	3	10	39	38	6	1	0	0	0	0	0	100
8	0	0	0	1	1	2	10	41	39	3	2	1	0	0	0	100
9	0	0	0	0	1	1	3	9	54	23	2	2	2	2	0	100
10	0	0	0	0	1	1	1	4	11	39	25	6	2	5	4	100
11	0	0	0	0	0	1	3	3	6	12	20	22	16	5	11	100
12	0	0	0	0	0	1	3	3	6	4	7	12	32	17	15	100
13	0	0	0	0	0	1	3	5	4	8	4	8	16	31	22	100
14	0	0	1	1	0	0	1	6	5	2	4	1	11	35	33	100
15	2	0	0	0	0	0	0	2	11	6	0	0	4	11	64	100
Total	2	40	18	15	9	5	5	3	2	0	0	0	0	0	0	100

Even in the case of the classification based on ESU central classes are those that move more than the others, for example they move from the old position to the immediately following or two more (Table 8.7).

Table 8.7	Distribution of farms classified according to Economic Size Unit (%)											
	0	**Less than 1**	**1-2**	**2-4**	**4-6**	**6-8**	**8-12**	**12-16**	**16-40**	**40-100**	**100 and more**	**Total**
0	100	0	0	0	0	0	0	0	0	0	0	100
Less than 1	1	72	24	3	0	0	0	0	0	0	0	100
1-2	0	8	45	42	4	1	0	0	0	0	0	100
2-4	0	1	9	47	29	9	3	1	0	0	0	100
4-6	0	1	1	14	27	27	23	5	3	0	0	100
6-8	0	1	1	5	13	19	37	16	9	0	0	100
8-12	0	1	1	2	5	9	25	24	30	2	0	100
12-16	0	0	0	1	1	4	13	18	56	5	1	100
16-40	0	0	1	1	1	1	4	6	51	32	3	100
40-100	0	0	0	1	0	0	1	1	10	53	34	100
100 and more	0	0	0	0	0	0	1	0	3	9	86	100
Total	2	27	18	18	8	5	6	3	7	4	2	100

With reference to types of farms in Table 8.8 is evident that some typology remain unchanged while for others, like livestock, there is a larger movement. Furthermore change is in favour of specialisation, as expected, for example mixed typology in old classification becomes specialised typology in the new one.

Table 8.8	Distribution of farms classified according to Type of Farming									
	Arable land	Horti-culture	Permanent crops	Herbi-vores	Grani-vores	Poly-culture	Breeding	Crops-breeding	Unclas-sified	Total
Arable land	80	0	2	1	1	10	0	5	1	100
Horticulture	0	88	1	0	0	10	0	1	0	100
Permanent crops	0	0	97	0	0	2	0	1	0	100
Herbivores	47	0	0	50	0	1	1	0	0	100
Granivores	3	0	0	0	63	0	0	4	30	100
Polyculture	5	1	30	1	1	47	2	13	0	100
Breeding	13	0	0	38	9	4	17	19	0	100
Crops-Breeding	12	0	6	33	6	12	7	23	0	100
Unclassified	0	0	0	0	0	0	0	0	100	100
Total	22	2	55	6	1	8	1	4	2	100

The last phase of the analysis takes into account the intersection between type of farming and SO and Table 8.9 shows that for example granivores represent only 1% of the total but they are concentrated in the upper classes while permanent crops, that represent 55% of the total, are concentrated in the lower classes.

Table 8.9	Distribution of farms classified according to new SO and Type of Farming (percentage of row)									
Classes of SO	Type of Farming									
	Arable land	Horti-culture	Permanent crops	Herbi-vores	Grani-vores	Poly-culture	Breeding	Crops-breeding	Unclas-sified	Total
1	0	0	0	0	0	0	0	0	100	100
2	30	0	60	1	1	6	0	2	0	100
3	18	1	64	2	0	10	1	4	0	100
4	18	1	59	4	0	11	1	5	0	100
5	18	3	53	9	0	9	2	6	0	100
6	17	5	45	16	1	8	2	7	0	100
7	14	7	38	25	1	6	2	6	0	100
8	12	8	31	36	2	5	2	6	0	100
9	11	8	22	45	4	4	1	4	0	100
10	9	8	13	45	17	3	1	4	0	100
11	6	7	8	38	34	2	1	4	0	100
12	5	5	7	28	49	2	3	2	0	100
13	3	6	4	19	60	2	3	3	0	100
14	1	4	3	10	74	2	5	1	0	100
15	0	4	2	5	86	1	2	0	0	100
Total	22	2	55	6	1	8	1	4	2	100

It is also important to note that about half of farms are concentrated in the lower classes independently from typology, the only exception are granivores that are represented in all classes, but this situation reflects the distribution of farms in General Census of Agriculture 2000, in fact in Italy the average size of farms is rather low (Table 8.10).

Table 8.10	Distribution of farms classified according to new SO and Type of Farming (percentage of column)									
Classes of SO	Type of Farming									
	Arable land	Horti-culture	Permanent crops	Herbi-vores	Grani-vores	Poly-culture	Breed-ing	Crops-breeding	Unclas-sified	Total
1	0	0	0	0	0	0	0	0	100	2
2	55	8	44	5	36	32	7	24	0	40
3	16	8	21	6	8	24	17	19	0	18
4	12	11	16	10	6	21	22	19	0	15
5	8	15	9	13	5	11	19	14	0	9
6	4	15	4	13	3	5	13	9	0	5
7	3	19	3	19	4	4	12	8	0	5
8	2	13	2	17	5	2	6	4	0	3
9	1	7	1	12	7	1	2	2	0	2
10	0	2	0	3	8	0	1	0	0	0
11	0	0	0	1	5	0	0	0	0	0
12	0	0	0	0	3	0	0	0	0	0
13	0	0	0	0	3	0	0	0	0	0
14	0	0	0	0	4	0	0	0	0	0
15	0	0	0	0	2	0	0	0	0	0
Total	100	100	100	100	100	100	100	100	100	100

8.4 Conclusions

The new typology introduced by Council Regulation 1242/2008 has several effects on the classification and the definition of the farms, this study is a first attempt to measure those effects in Italian agriculture using the data of Agricultural Census and the matrices of transition. At the moment the analysis at national level shown a general trend for the holdings to stay in the same class of Standard Output, or the same class of SGM or the same Type of farming. The evaluation of first results also seems to suggest that in some cases probably old classification was not able to represent farm specialisation and furthermore not always changing in Standard Output classification produces changes in typology.

In an attempt to assess how farms move from a class to another it emerges that most changes are up the diagonal of the matrix and from the old location to those immediately following, but this behaviour seems to be directly linked to the new definition of Standard Output and to the fact that usually new values are higher than the previous SGM. The analysis based on types of farming shown also different changes according to different type, some typology remain stable while others change and usually, as expected, changes are in favour of more specialisation.

This preliminary work at national level provides future developments, the analysis will be detailed also at regional level, and the methodology will also applied to next Agricultural Census to enable comparisons between different sources.

8.5 References

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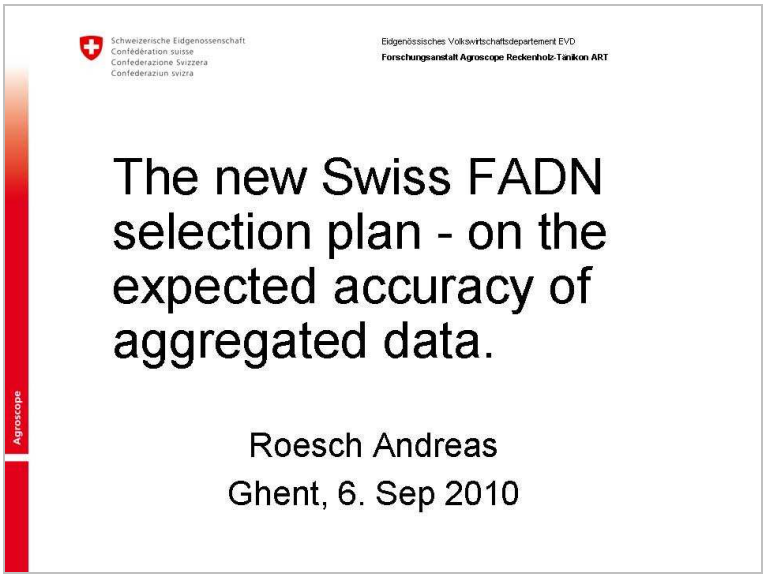
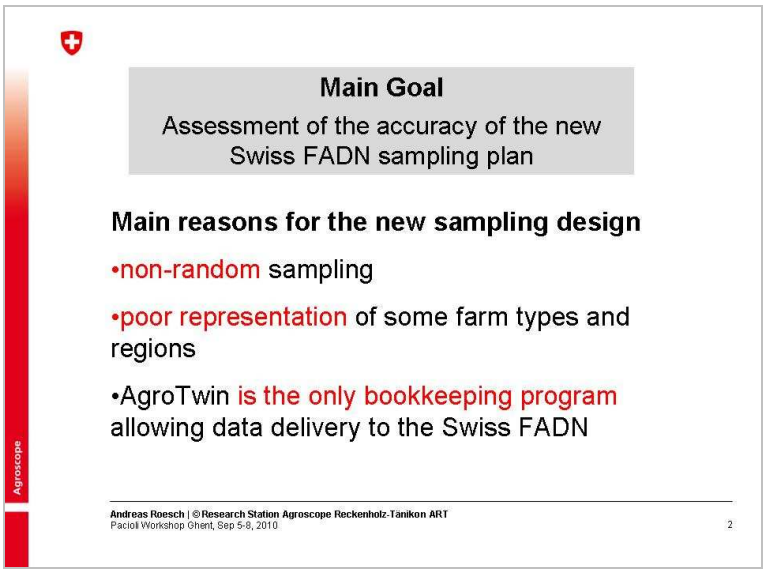
9 New Swiss FADN selection plan - on the expected accuracy of aggregated data

Andreas Roesch





Major principles of new FADN design

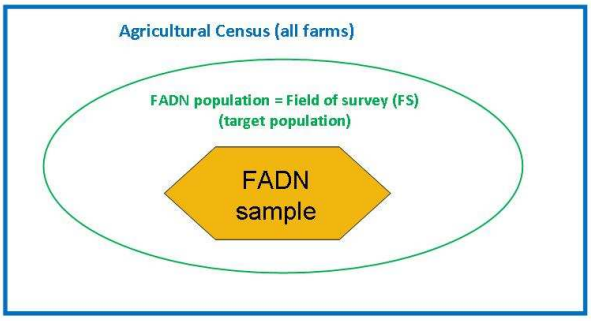
- **Random** sampling (Rotating Panel)
- **Two samples** (A and B) for meeting different requirements
- **Reduction** of number of strata
  (from 11 (farm types) x 3 (regions) x **5** (land classes) =165
  to 11 (farm types) x 3 (regions) x **2** (land classes) = 66)
  - **Compatibility** with all accountancy software packages used in the agricultural sector in Switzerland

Sample B Sample A: sampled in all strata

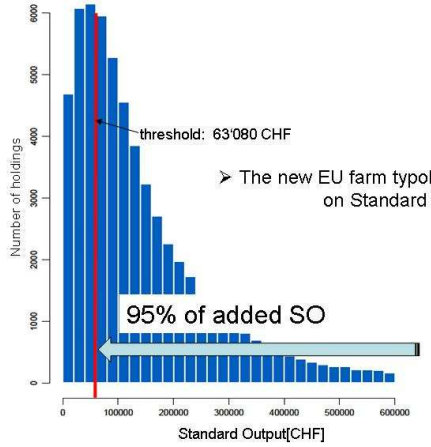
	Arable crops	Special crops	Dairy	Suckling cows	Other cattle	Horses/sheep/goats	Pigs/ poultry	Comb. dairy/arable	Comb. suckling cows	Comb. pigs/ poultry	Combined others
Mountain region	NA							NA	NA		
Hilly region	NA										
Plain region											
	11	12	21	22	23	31	41	51	52	53	54 ← farm type

Definition of the FADN population

*Census – **FADN population** – FADN sample*



Distribution of Standard Output (2007 census)

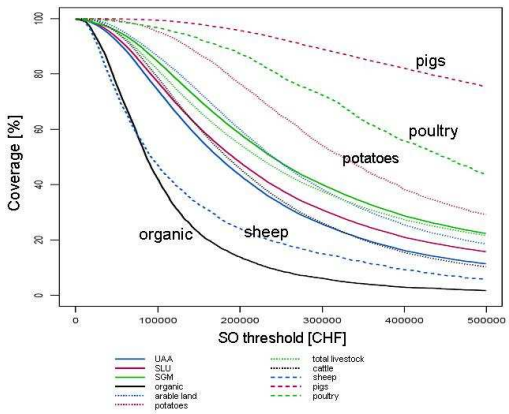


➢ The new EU farm typology will be based on Standard Output

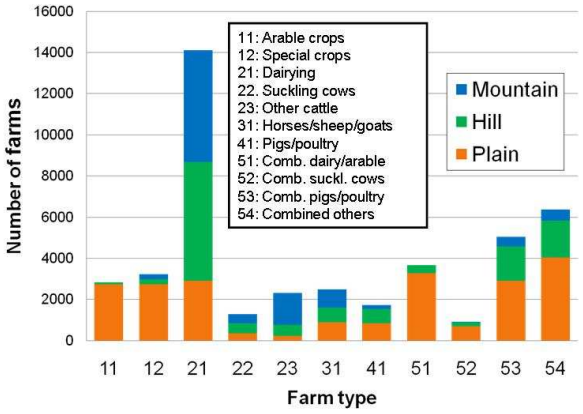
Percentage coverage of the field of survey (2007)

Farm type/ UAA	<10ha	10-20ha	20-30ha	30-50ha	>50ha
11 Arable crops	12.6	68.4	98.2	99.9	100.0
12 Fruit/ vegetable/ vines	42.9	99.9	100	100.0	100.0
21 Dairy Farms	47.1	91.4	98.5	99.9	100.0
22 Suckling cows	6.8	36.9	59.4	77.3	88.2
23 Other cattle	12.6	54.5	78.9	87.9	91.1
31 Horses/sheep/goats	29.7	71.9	94.7	99.0	100.0
41 Pigs/poultry	89.1	96.6	96.4	100.0	100.0
51 Comb. Dairy/arable	77.9	99.5	100	100.0	100.0
52 Comb. Suckl. Cows	21.1	81.0	99.3	100.0	100.0
53 Comb. Pigs/poultry	87.7	98.9	99.7	100.0	100.0
54 Combined others	23.0	81.1	96.9	99.1	99.6

Sensitivity curves. SO-threshold vs. coverage



FADN population (2007)

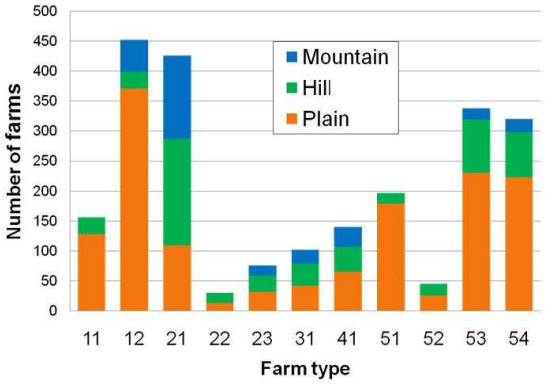


Sample A and B

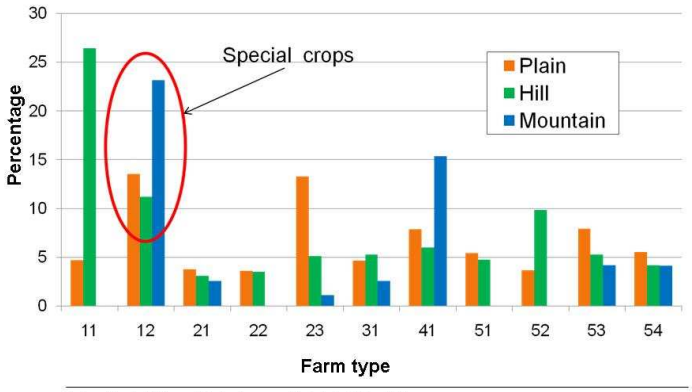
	Sample A	Sample B
Level of detail	little	very high
Considered farm types	**All strata**	Plain: 11, 21, 51, 53, 54 Hill: 21, 53, 54 Mountain: 21, 22, 23, 31
Sample size (2007)	2'535	2'361
Number of holdings in the field of survey (2007)	43'964	33'417
Accuracy of the SGM at the Swiss level	q_A=3.0%	(q_B=2.1%)
Accuracy constraint on the stratum level	$q_{h,A}$<25%	$q_{h,B}$<20%

q= half-length of 95% confidence interval divided by mean

Sample A: Number of farms (2007)

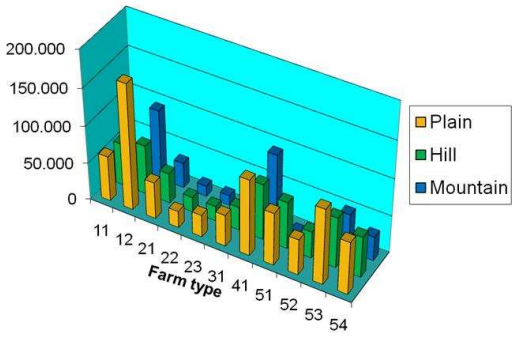


Sample A: Sampling fractions



Standard Deviation of SGM (2007)

in Swiss Francs



Accuracy Assessments from simulations

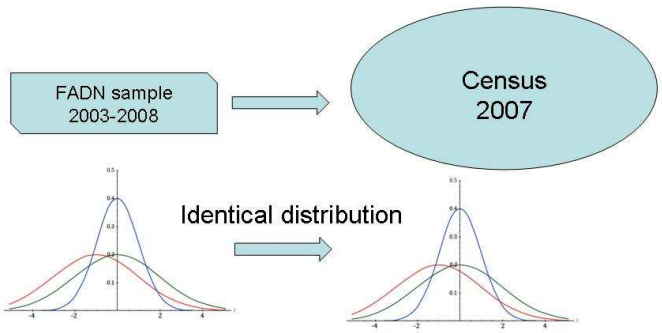
Method: Simulated sampling

1. number of holdings per stratum from selection plan
2. perform simulations (n=2000)
3. compute distribution and statistics

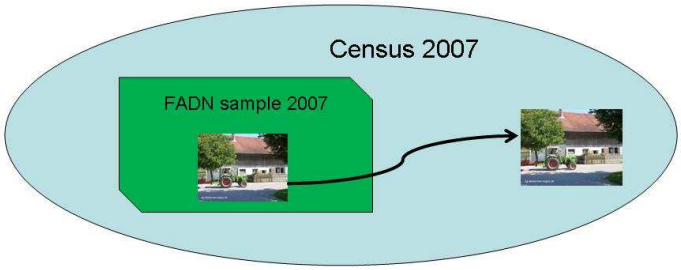
4. **comparison with census data**
   => Distinction of two cases:

1) Variable available in census data -> direct comparison
2) Variable only available in the FADN data
-> apply two methods for (all) census farms
- a) adopt FADN distribution from 2003-2008
- b) statistical matching

Matching of distribution: FADN sample <=> census



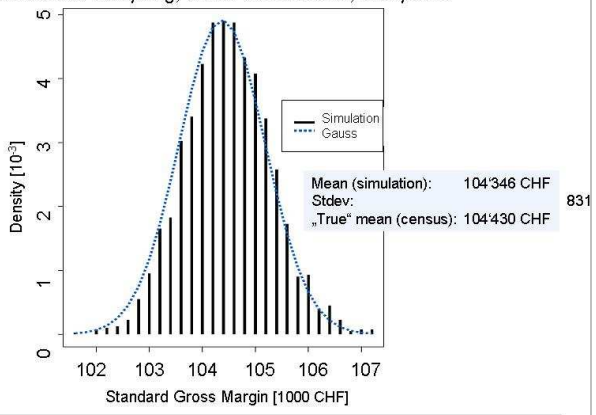
Statistical matching



Selection of „similar" farm => select farm with smallest „distance"
=> use „imputation variables"
(e.g., age of farmer, arable land, cattle, labor)

Density for (weighted) Swiss SGM mean (2007)

Simulated sampling, 2'000 simulations, sample B



Accuracy estimates with simulated sampling (sample B)

(Swiss mean, 2007, 2000 simulations)

Parameter	True mean (FADN pop.)	Mean from simulated sampling	Standard deviation	Confidence int. (95% level)	COV
Usable agric. area	21.18ha	21.24 ha	0.14 ha	+/- 0.28ha	0.6%
Open arable land	6.01ha	6.00 ha	0.06 ha	+/- 0.12ha	1.0%
Grassland	14.43ha	14.52ha	0.11 ha	+/- 0.22ha	0.7%
Livestock	27.1 LU	27.3 LU	0.2 LU	+/- 0.4 LU	0.7%
Stand. output	256'860 CHF	257'205 CHF	2'411 CHF	+/-4'227 CHF	0.9%
Stand. labor Unit	1.90	1.89	0.01	+/- 0.02	0.6%
Stand. Gross Margin	104'346 CHF	104'430 CHF	831 CHF	+/- 1'628 CHF	0.8%

COV= coefficient of variation

Accuracy estimates with simulated sampling (B)

(Arable crop, UAA>20ha, 2007, 2000 simulations)

Parameter	True mean (FADN pop.)	Mean from simulated sampling	Standard deviation	Confidence interval (95% level)	COV
Usable agric. area	35.39ha	35.41ha	0.95ha	+/-0.19ha	2.7%
Open arable land	29.39ha	29.40ha	0.80ha	+/-1.60ha	2.7%
Grassland	5.39ha	5.39ha	0.21 ha	+/-0.42ha	3.8%
Livestock	9.01 LU	9.00 LU	0.71 LU	+/-1.39 LU	7.8%
Stand. output	236'126CHF	236'045	9'196	+/-18'023CHF	3.9%
Stand. labor unit	1.45	1.45	0.05	+/-0.1	3.5%
Stand. gross margin	127'521CHF	127'559CHF	4'370CHF	+/-8'566CHF	3.4%

Accuracy estimates with simulated sampling (sample B, 2007)

1: Switzerland 2: Arable crop, UAA>20ha

Parameter	Unit		"True" mean (FADN pop.)	Mean from simulated sampling	Standard deviation	Confidence interval (95% level)	COV
Agricultural income	CHF	1	60'465	60'476	521	+/-1'021	0.9%
	CHF	2	68'185	68'161	2'299	+/-4'506	3.4%
Work income per fam. worker	CHF	1	41'501	41'537	572	+/-1'121	1.4%
	CHF	2	62'000	61'991	3'643	+/-7'140	5.9%
Family annual work unit	CHF	1	1.25	1.25	0.01	+/-0.02	0.5%
	CHF	2	1.03	1.03	0.03	+/-0.06	2.4%
Cash flow	CHF	1	101'948	102'049	654	+/-1'282	0.6%
	CHF	2	107'792	107'853	2'582	+/-5'061	2.4%
Loan capital	CHF	1	366'495	367'680	4'287	+/-8'403	1.2%
	CHF	2	292'238	292'104	14'586	+/-28'589	5.0%
Farm assets	CHF	1	778'490	777'777	5'962	+/-11'686	0.8%
	CHF	2	718'857	718'735	20'410	+/-40'003	2.8%
Equity capital	CHF	1	454'604	453'565	4'556	+/-8'930	1.0%
	CHF	2	472'363	471'663	18'265	+/-35'799	3.9%

Accuracy estimates, CH-means, 2007

Simulated sampling (sample B) & Statistical matching

Parameter	"True" mean (FADN pop.)	Mean from simulated sampling	Standard deviation	Confidence interval (95% level)	COV
Agricultural income	**67'597 CHF**	**67'556 CHF**	**624 CHF**	**+/-1'222 CHF**	**0.9%**
Work income per fam. worker	**41'501 CHF**	**41'537 CHF**	**572 CHF**	**+/-1'071 CHF**	**1.4%**
Family annual work unit	**1.25**	**1.25**	**0.01**	**+/-0.02**	**0.5%**
Cash flow	**107'590 CHF**	**107'511 CHF**	**784 CHF**	**+/-1'536 CHF**	**0.7%**
Loan capital	**404'341 CHF**	**403'956 CHF**	**5'127 CHF**	**+/-10'050 CHF**	**1.3%**
Farm assets	**846'281 CHF**	**845'717 CHF**	**7'757 CHF**	**+/-15'205 CHF**	**0.9%**
Equity capital	**457'754 CHF**	**457'817 CHF**	**5'432 CHF**	**+/-10'647 CHF**	**1.2%**

Summary

- ✓ **Random sample**
- ✓ **Two samples** for meeting different requirements
- ✓ **Standard output** is **appropriate** for defining the FADN population
  Main drawback: Farm type „suckling cows" poorly represented
- ✓ Estimates of **accuracies** using **simulated sampling**
  => confidence intervals
  - ✓ **Sampling plan** captures **mean statistics well**
  - ✓ Accuracies **clearly lower at stratum level** than at Swiss level
  - ✓ **Statistical matching** technique **not suitable** for estimating missing census variables.

10 Applying the European FADN methodology in a new member state: Principles for statistical choices based on Eastern projects

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10.1 Introduction

Creating the Farm Accountancy Data Network (FADN) in a new member state is quite a big task. Good and comprehensive methodology already exists at European level as the history of the FADN goes back to over 40 years, however, it is not easy to apply the methodology in a new member state (or in an accession country). In addition to political and organisational issues concerning data collection, processing and dissemination (see AAMISEPP/DEL'HOMME, PACIOLI 17 workshop), certain technical aspects have to be taken into consideration, especially those regarding determination of the national sample size for the FADN and initiating the process. It is always necessary to combine theoretical and practical aspects throughout the FADN implementation process which takes several years. However, some main principles are not easy to be defined and a detailed description of these principles is hardly ever provided.

In a number of new member states external assistance is available to contribute to launching the FADN. Based on the examples from Estonia, Bulgaria and Croatia, we as experts on implementation of the FADN in those countries would like to introduce the outcomes of the pilot project. We are going to focus on the aspects of sampling and not on all the process of launching the FADN. After giving a brief overview of the European guidelines provided for the FADN sampling, we will explain how the 'Pilot Project Approach' provides solutions for efficient implementation of the FADN in a new member state.

10.2 Prerequisites for defining the FADN sample: knowledge in economics and statistics

Regarding the logic provided by the European FADN methodology, statistical aspects for defining the sample size in a country are quite clear. Thus, statistical reasoning behind the methodology can be quite easily identified: data has to be collected, standards used, calculation rules applied. However, in addition to explaining and understanding the EU guidelines the specific character of local conditions often plays an important role in applying the FADN methodology causing deviations from the EU guidelines, mostly at the beginning of the implementation process.

10.2.1 The EU methodology requirements

We would like to cover a couple of important aspects to be taken into account when defining the sample size. Three main ideas can be pointed out.

Data requested
As the FADN is based on individual data at farm level, a lot of data have to be collected from farms, mainly:

- basic data on farms: the data are normally provided by the Agricultural Census (number of hectares (UAA) and agricultural animals on the farm). The data are necessary for calculating the type of farming and economic size of each farm in a member state using standard values (Standard Gross Margin

(SGM), replaced by Standard Output (SO) today). The composition of the population and the sample size are defined on the basis of typology calculations in order to represent the entire agricultural sector of the country. Thus, it is important to get recent data. For example, in Bulgaria and Croatia the last census was carried out in 2003 (the data could be used in Bulgaria where the sample was defined in 2006; the situation was more difficult in Croatia where the sample was defined in 2008). Due to big changes at farm level in a few years availability of census data is an issue to be discussed (in other Member States the Farm Structure Survey (FSS) is used for updating the census data). Sometimes the situation is even more complicated. In Estonia implementation of the FADN was initiated in 1997. The latest Agricultural Census had been carried out in 1939 and the number of farms (not to mention the economic size of the farm and type of farming) was not known. Thus, it was impossible to use the EU method for defining the sample size at the beginning;

- micro-economic data: the main specific feature of the FADN is that it is based on economic and financial data. Farm accountancy is the best tool for providing such data (general and analytic). However, in many cases accounts or other records do not exist at farm level and it makes data collection for the FADN very complicated. In the initial stage collection of the accountancy data had to be replaced by farm visits. Evidently the number of farms visited by data collectors was not significant; also, lack of accountancy had an impact on the quality of data. Today, in Estonia, for example, accountancy is obligatory simplifying collection of the FADN data of good quality, at the same time in Bulgaria and Croatia the share of farms keeping accounts is insignificant (less than 10%), therefore, data collection in most cases has to be organised by means of farm visits and filling in questionnaires.

Standard Gross Margin (Standard Output) definition

Standard Gross Margin (SGM) is a term from the European methodology for classifying farms by the economic size. Such a term does not exist in new member countries. Due to lack of individual data sources, SGM often has to be defined by expert teams instead of being drawn from surveys on market prices or production costs. Availability of such value is necessary for defining the sample. It has to be pointed out that introduction of new methodology where Standard Output (SO) is the basis for the classification of typology and direct payments granted for farmers are not taken into account any longer and the period of calculation of average SO coefficients is longer (five years), will without doubt have positive impact on the quality of sample. For example, in Estonia, according to the methodology for the FSS 2005 the SGM coefficients of year 2003 (average of 2002, 2003 and 2004) were taken into account. But after the accession in 2004 direct payments were already much bigger than before 2004 and therefore, the type and size of farms in the population did not reflect the reality any longer.

Typology by region, type of farming and economic size

The European methodology has to be applied to define the type of farming and economic size of a farm. In some cases it is difficult to define the level of detail for the type of farming relevant in each country due to the diversity of production that can be found. Also, the level of detail is related to the number of regions to be taken into account in the FADN. It may happen that the types of farming defined in the European methodology cannot be adapted to the actual situation of farms. However, there is no other option than applying the European methodology.

Number of regions

The European methodology provides NUTS regions for the purpose of defining the number of regions relevant for the FADN in a country. However, other characteristics may also play a role: diversity of production in different regions, the output of the same product may differ from region to region, increasing the sample size (having an impact on data collection) in several regions (to maintain representativeness in main types of farming at regional level). Clearly the number of regions is not only related to statistical aspects. One recommendation could be to reduce the number of regions as much as possible as long as data collection is carried out by means of manually completed questionnaires.

10.2.2 Defining the universe of commercial farms

Once the requested data based on census are available, the European typology has to be applied for calculating the economic size and type of farming of all farms. Then, the universe of commercial farms is quite easy to find using the representative threshold of 90% of total output or land used.

The proportion of very small family farms in new member states when compared to old member states seems to be very high. However, very large legal entities are also present in some new member states. This means that when applying the rule of covering 90% of the production or land used, the majority of small farms are excluded from the FADN universe due to their size. For example, in Estonia only 24% of farms correspond to the FADN universe, 28% in Croatia, 25% in Bulgaria. Big difference in size and legal form of the farms within the population might cause problems when defining the universe. Representativeness is justified in terms of production or land use, but would be more difficult to define in terms of the number of farms. Maybe agricultural policy regarding the FADN should be reviewed to amend the provision about the number of farms when defining representativeness of the FADN sample. However, when comparing new member states to old member states, the thresholds for economic size of farms are lower in new member states (economic size classes of farms and thresholds are defined on the basis of SGM calculations including direct payments granted for farmers, therefore the farms in new member states are always much smaller than in old member states even if they have the same number of hectares and animals).

10.2.3 Statistical knowledge

On the basis of statistically correct universe it is possible to define the so-called ideal sample.

Statistical calculation rules for sampling

Once again, depending on the number of the FADN regions which have been selected, the ideal size is in most cases calculated by means of statistical rules (proportional allocation, optimal allocation (Neyman-Tschuprow), quota method, randomisation …). Knowledge about defining the ideal sample size is usually available in Statistical Offices, but has also to be developed in the Liaison Agencies. However, it is important to check the representativeness in relation to the whole country.

Individual and Standard Results

If the ideal sample is drawn from the universe, two main types of results can be produced: individual results of the farms in the sample and collective results (results of the sample extrapolated to the agricultural sector as a whole in the country). The use of weighting coefficients is necessary for the sake of collective results. It is a technical aspect to be managed either by the Statistical Office or the Liaison Agency. Such weighting coefficients allow production of Standard Results in accordance to the European methodology.

It is important to follow all the rules provided by the European methodology for sampling. Relevance of the FADN results depends greatly on comprehensibility and applicability of the methodology. However, in many cases the situation is different making it quite difficult to use the methodology in the current form and to the given extent and very often certain adoptions have to be made.

10.3 The Pilot Project Approach provides training in methodology

As mentioned before, initiation of the FADN is a complicated process. It takes time to implement such network, the more so when nothing has been prepared at the national level. It certainly takes time and requires human resources and good software tools to obtain knowledge of the FADN to set up the network in a new member state. Waiting too long before initiating the work on data collection makes the situation even more complicated. All theoretical aspects are of fundamental importance; however it would be a good idea to start working on data collection even if everything has not been defined in detail yet. We call

such work the Pilot Project Approach involving various fields of activities. I'm going to explain and underline several points concerning the Pilot Project Approach.

10.3.1 Pilot project: theoretical and practical aspects of sampling

The first step towards the ideal sample: starting with the data available

In a new member state a decision on initiating the work in the field of the FADN can be made even without having a clear idea of the sample (in case the census was conducted too many years ago). In several cases it is the only way for launching the FADN. A pilot project concerning the FADN is a project which contributes to the initiation of the FADN activities (data collection, data processing, data dissemination) involving a group of farms which may be far away from the ideal sample (smaller, without any representativeness in terms of economic size of the farm or type of farming) and recruited on voluntary basis. This first 'sample' is just formed for initiating the FADN process and not for providing relevant results. Its main goal is 'learning by doing', even if the results are not relevant in terms of representativeness. Data collection may even be based on the Farm Return; however, it can be completed partially and not necessarily providing all data requested by the European FADN.

However, it is necessary to calculate the economic size of farm, type of farming, total SGM (or SO) for each farm of this first 'sample'. Also, some weighting coefficients can be calculated just for understanding the logic of weighted results.

Starting with smaller number of farms and increasing the sample size year by year, updating of census data

It is interesting to follow the process of launching the FADN within a pilot project. Great organisational effort is required for initiating the process and good arguments for complying with the rules have to be given. As the sample size is small at the beginning, a plan for increasing the sample size year by year can be drawn. In Bulgaria the pilot project started with 90 farms (final sample size is 2000), in Croatia with 86 farms (final sample size around 1500), in Estonia with 50 farms (final sample size 500).

Pilot projects in Bulgaria			
Years	**Total returning holdings**	**With double sided book keeping**	**Without double sided book keeping**
2002	91	73	18
2003	655	515	140
2004	920	500	420
2005	1060	500	560
2006	2000	600	1400

Pilot projects in Croatia			
Years	**Total returning holdings**	**With double sided book keeping**	**Without double sided book keeping**
2008	86	4	82
2009	250	25	225
2010	500	50	450
2011	1000	100	900
2012	1500	300	1200

Starting with lower statistical requirements

When starting the work with a small number of farms (less than 100), it is not always necessary to apply statistical rules for selecting the farms. It may even complicate the process too much at the beginning. Depending on the way data collection is organised, a group of farms is set up on voluntary basis using

the network of the Liaison Agency (agricultural chambers, extension services, private advisory services, farmers' unions, technical networks etc). Statistical rules for selecting farms in the sample as well as for calculating the results have to be applied only when the sample size has sufficiently increased (up to over 200 farms). At the beginning the sample is a combination of a sample of available farms (selected on the basis of rough statistics) and the ideal sample. The selected farms set up their accountancy according to the requirements and later new farms with required accountancy will be added in the sample according to the statistical rules.

Taking into account rapid changes in agricultural sector: a set of farms larger than the expected sample size

It may be complicated for certain countries to apply the statistical rules even if the sample has been set up on the basis of the last census (can be updated). Quick changes in the economy may change the situation in farms on yearly basis. Keeping that in mind there is a high probability that the situation has changed (mainly in terms of the economic size of the farm and type of farming) in the farms having been selected in accordance with the rules of the ideal sample (farm type, farm size, farm location). Therefore, it would be a good idea to select a set of 'sample farms' on the basis of census including 3 times more farms than the expected sample size in order to be able to replace the farm having undergone changes (or terminated farming). Such organisation requires good cooperation between the Liaison Agency and the Statistical Office.

There are other advantages in the Pilot Project Approach to be considered.

10.3.2 Pilot projects: data collection before calculating the results

When initiating a pilot project there are a number of specific issues to be considered. Data collection is one of the first tasks to be fulfilled. As already explained, in new member states the majority of farms do not have any accounts at farm level. So in the first years data collection has to be organised manually (using diaries for the registration of economic records). In addition to organisational aspects which are certainly important, the quality of data is of major concern.

Focusing on data quality at farm level in data collection and taking the data control process very seriously

Before applying any statistical rules for producing the results or improving the selection plan for defining the sample, ensuring the quality of data should be the first priority. Manual data collection often means that data are not accurate because a lot of errors are made. In addition to transcription errors wrong data are provided due to wrong estimates or missing data at farm level. Obviously it is an issue to be improved before commencing other tasks. The pilot project has drawn attention to this aspect of data collection. Data quality depends on data collection process (and the collector), but also on monitoring the implementation process. In general the idea is that the closer to the farm/data source the authenticity of the data is checked, the better the quality of data is on the whole. It is much easier to correct errors in the vicinity of the farm than in the Liaison Agency several hundred kilometres away.

Preparing IT tools: from data collection to data dissemination. First and foremost: a database

IT aspects are essential for insuring sustainability of data collection. The Pilot Project Approach suggests planning, organisation, development and testing of IT tools from the initial stage of data collection. Links between the questionnaire (if data collection is manual), the Farm Return form and database have to be created in order to manage the FADN according to the plan. Nowadays computerisation of data seems to be the only option. First and foremost, the database has to focus on the collection of data rather than the aspects concerning production of results. The characteristics of a sample are not so much dependent on IT solutions. However, IT solutions have to be selected and implemented before the intended number of farms in the sample is reached and it is necessary to work more thoroughly on the sample as well as the collected data.

Also, when developing the first IT solutions within a pilot project it is recommended to keep in mind the final estimated sample size.

10.3.3 First, provision of results at farm level, second, at national level

Individual results first

After initiating work on the FADN results are often expected at an early stage. It is true that the results are the most efficient means of demonstrating the benefits of the FADN in the countries not familiar with the FADN network. However, production of results without statistical validity in case the sample has not been defined according to the requirements is one of the concerns.

At first it is possible to provide results at farm level (individual results). These are regular data produced by farm accounts (it can be in the form of tables such as the FADN Farm Return form as well an accounting report including a profit and loss statement and a balance sheet).

Trying to get quick results on the basis of small groups of farms not necessarily taking into account the principle of representativeness

After provision of individual results collective results can be calculated. We suggest not to wait until representativeness can be defined but to start with the provision of results on the basis of small groups of farms just to demonstrate what can be done in the field of the FADN (calculation of averages, standard deviation, drawing graphs, production of tables of results etc). Of course, it is necessary to be careful when analysing the first results which are not at all representative but provided for the purpose of giving an idea of the FADN.

10.3.4 Training people

One of the main advantages of the Pilot Project Approach is 'learning by doing'. People involved in the data collection learn to interpret the data and find errors. The project gives recommendations for organising a more efficient control system. People involved in data analysis learn to make conclusions and understand what is relevant and what is not. Also, they are trained to work on and analyse large amounts of data and taught to make conclusions on the basis of the available data. People involved in the FADN management learn how to apply the European FADN methodology in their country taking into account the specific conditions. The participants are trained to use the step by step approach and find solutions to issues related to local diversities.

Training can be organised without waiting for all statistical aspects to be clarified. As launching the FADN is a lengthy process, implementation of specific tasks at an early stage can be an advantage at a later stage. The people involved can learn the complicated rules of the European methodology step by step starting from the basic knowledge. The Pilot Project Approach provides more efficient management of the FADN.

However, although the Pilot Project Approach is efficient for implementing the FADN at an early stage, it is not sufficient for applying the European methodology in full.

10.4 Statistical knowledge: only one of the competences needed

Generally speaking, implementation of the FADN in a member state requires fulfilment of 3 main conditions:

- knowledge inside the team (even informal), ability to learn, understand and apply the EU methodology and the FADN system;
- availability of appropriate IT tools for the management of data of good quality (both at farm level and European level);

- capacity for good technical and human resource management at local and national level in different fields of competence, creation of the FADN management team (appointed by the Liaison Agency).

It means that success in launching the FADN is not only related to the application of statistical knowledge but a number of other conditions have to be taken into consideration.

10.4.1 Small teams with relevant competence and shared responsibilities are likely to succeed

Due to the complexity of implementation of the FADN the fields of responsibility are always shared between several persons and even various institutions (Ministry of Agriculture, Statistical Office, Extension Service, Research Institutes, Accountancy Offices…). All those persons or institutions together have to build up the 'common national FADN methodology' using the available means and competence.

Several institutions involved: developing national methodology within the EU system (typology, sampling)
Cooperation of different parties is necessary for calculating the SGM (or SO) coefficients, determining the thresholds of economic size of farms, defining the national typology and discussing the sample size and distribution at regional level. National methodology can be used in all types of surveys concerning the FADN. Use of the same definitions and typology allows better analysis of all results provided. And obviously, knowledge in different fields of activity must be available to come up with the best option for the national methodology.

Uniting different competence including all relevant parties in addition to statisticians, managers, universities
The European methodology provides mainly guidelines in the field of statistics concerning sampling, thus statistical knowledge is required. The national methodology also involves other fields: knowledge in farm management is necessary for providing Standard Output or Gross Margin, defining relevant farm types based on the production in the country involved and commenting on the FADN economic and financial results at farm level as well as national level. Knowledge in economy is useful for analysing the results at national and European level.

Only good cooperation between the named relevant parties (individuals and institutions) with the required competence in different fields of activity enables good results to be produced. Otherwise errors can occur, bottlenecks have to be solved and a lot of time is wasted.

A good management team
Finally, success in launching the FADN is very much dependent on human resources - first and foremost on the people in the management team (Liaison Agency). Capability of managing the theoretical, technical and human aspects of the FADN is critical to the success of the FADN.

Obtaining theoretical knowledge in statistics is essential even if the statistical data is incomplete at the initial stage of launching the FADN. However, it is not the most important aspect of creating the FADN. It is important to know the principle role of the FADN - it is often even more important than detailed knowledge. The FADN team manager must have some knowledge in all relevant fields of the FADN but most importantly, he/she has to be good at team management (and management of financial resources). In general a team of 5-10 members would be most efficient at national level.
Last, but no least, time is a significant factor.

10.4.2 Implementation of the goals of the European FADN may take several years

As already explained, implementation of the FADN may take years, thus time is an important factor to be managed as wisely as other factors. The Pilot Project Approach applied for initiating the FADN describes a process which may take years. Also, implementation of the FADN as requested by the EU takes several years.

10.4.3 Quick application of the EU methodology is difficult: it requires time

Obtaining all necessary knowledge about the methodology, data collection, data processing and data dissemination regarding the FADN is realistic only in case it can be done over several years. Pilot projects need enough time for carrying out series of trainings. It is necessary comply with the recent changes in the European FADN methodology: study the new sampling rules applicable from the accounting year 2010 and major changes in collection of additional data from the year 2013 onwards. It makes the situation in the countries having just initiated the FADN even more difficult. It will probably lengthen the time of launching the FADN in a new member state.

It takes time to promote the FADN as a good tool for making analyses at microeconomic level in a new member state

What applies to the provision of data also applies to the analysis of data. Only several years' practice in carrying out the analysis makes a person competent in micro-economic and financial data analysis in agricultural sector. As the FADN provides results only once a year, it takes at least 5-10 years to be able to provide analysis of good quality.

Politicians have to support (and finance) the FADN on yearly basis to get results of good quality

Politicians having the responsibility of financing the FADN often consider the time spent on learning as the time wasted. Thus, it is always difficult to convince them that launching the FADN takes several years before 'good results' (results relevant for analysing the national situation in agriculture) can be provided. Due to this the EU accession countries are rarely ready for the FADN and are able to provide only rough data in the first years.

Once the FADN has been created, it is sometimes difficult to manage it properly due to lack of human resources. Allocation of these resources is the responsibility of the Ministry of Agriculture or other institutions involved. As launching the FADN is a lengthy process it is required that the FADN management team works on a full time basis. This does not seem to be obvious for the politicians, especially when they do not know what the concept of the FADN stands for.

10.5 Conclusion

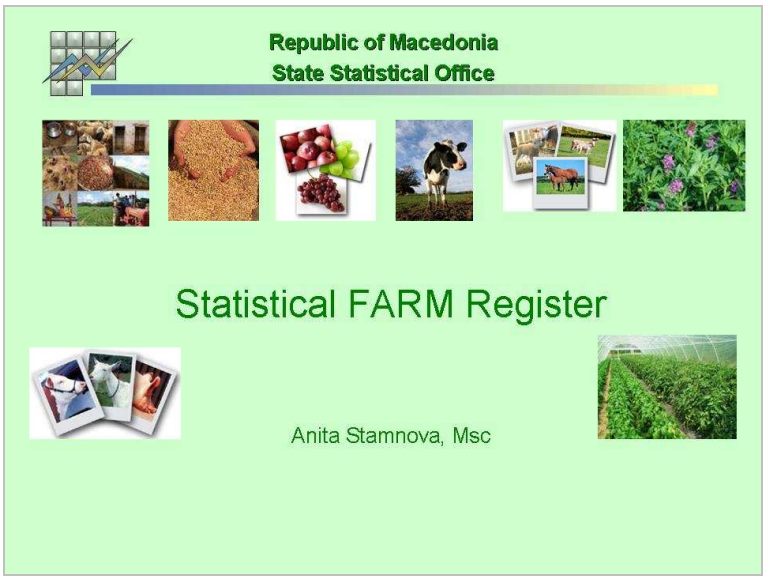
Although the European methodology for creating the FADN is comprehensive and well documented its application in a new member state is a huge task. All necessary statistical rules can rarely be directly applied because of diverse local situations; therefore, specific issues have to be attended before it is possible to implement the whole system. In particular, statistical terms and definitions such as the economic size class and type of farming need to be adapted to the local conditions before drawing the FADN sample. Lack of data is often the main difficulty.

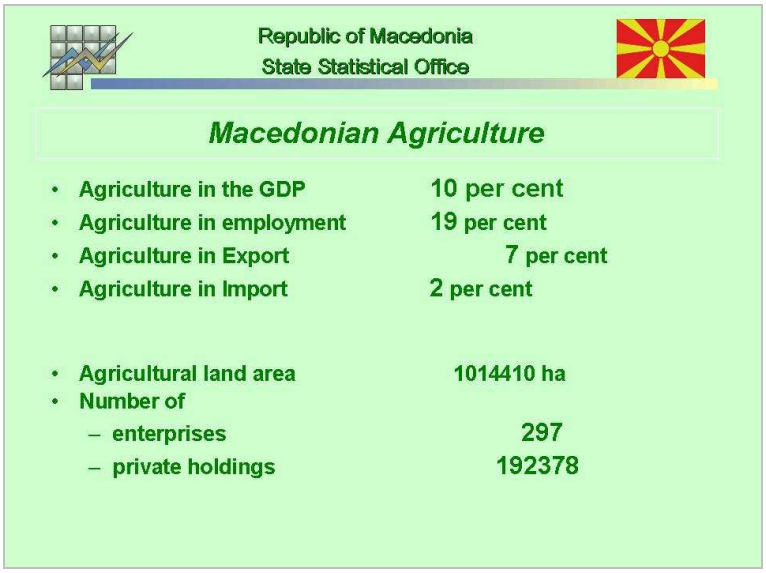
Application of the Pilot Project Approach may be a good solution in case implementation of the FADN is being planned. Such approach allows balancing of theoretical knowledge and learning with practical work within the network.

Defining the national FADN methodology requires knowledge in different fields of activity, also, it takes time and involvement of the main stakeholders in the FADN activities, therefore, implementation of a pilot project is one of the most efficient solutions. It also contributes to better management of other resources required by the FADN such as human resources, IT tools and time.

11 Statistical farm register

Anita Stamnova, Msc, Republic of Macedonia, State Statistical Office





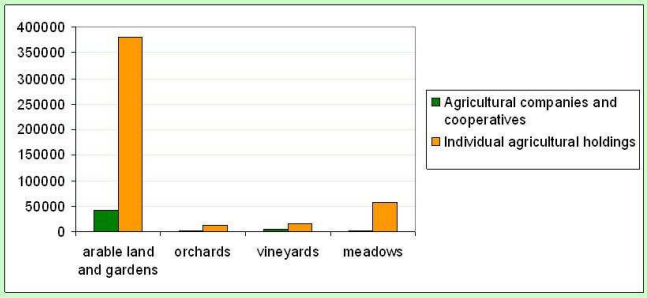
Republic of Macedonia
State Statistical Office

Forms of businesses

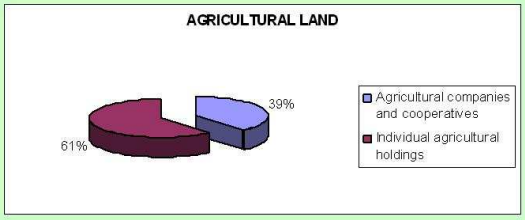
Macedonian practice

- **business units**
- **Individual agricultural households**

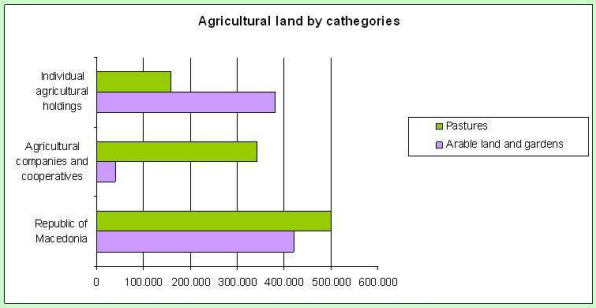
CULTIVATED AREA BY CATHEGORY OF USE, 2009



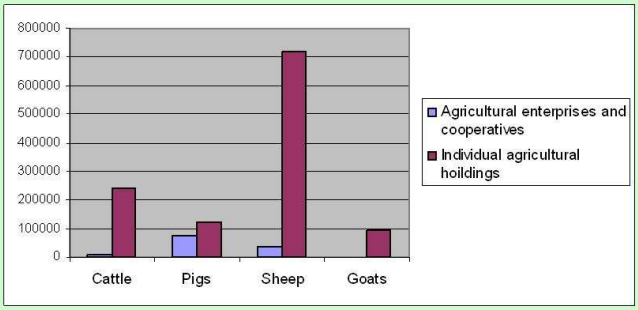
AGRICULTURAL LAND, 2009



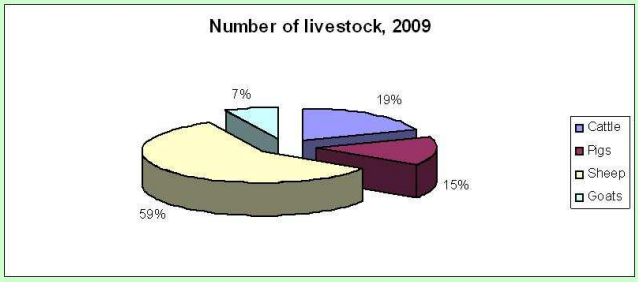
AGRICULTURAL LAND BY CATHEGORIES



Number of livestock by businesses, 2009



Number of livestock in total, 2009



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AGRICULTURAL STRUCTURES

- AGRICULTURAL STRUCTURES
- AGRICULTURAL MONETARY STATISTICS
- CROP PRODUCTION
- ANIMAL PRODUCTION
- LAND USE
- FORESTRY STATISTICS
- FISHERIES STATISTICS

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LAND USE

LAND USE CATEGORIES	DISTRIBUTION, %	
– ARABLE LAND	22.0	
– KITCHEN GARDEN	0.1	
– ORCHARD	0.8	
– VINEYARD	1,0	
– GRASSLAND	26.2	
• AGRICULTURAL AREA		**50.2**
– FOREST	49.8	

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Statistical farm registers are a key tool in agricultural statistics, particularly for selecting representative samples of agricultural holdings for conducting of surveys as well as framework for conducting of agricultural censuses.

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Statistical purposes of the SFR :

(1) Selecting random samples of agricultural holdings, including stratified random samples, to be contacted for statistical surveys;

(2) Defining the weighting structure to be used to provide grossed up representative results for sample surveys;

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Statistical purposes of the SFR :

(3) Providing immediate authoritative information on the current structure of agricultural holdings;

- (4) Providing longitudinal analyses on historical trends in the overall structure of agricultural holdings;

(5) Incorporating information from different statistical and administrative sources to update the register.

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Six key principles underpin the structure and content of a statistical farm register:

(1) All agricultural holdings are covered;

(2) The concepts and definitions used in the statistical register are based on statistical requirements;

(3) Each holding is allocated a unique identification code which does not change over time;

Six key principles underpin the structure and content of a statistical farm register:

(4) The register contains a series of identifiers used to link to information from other data sources;

(5) The information held on individuals or individual holdings is confidential and can only be used for statistical purposes;

(6) The register contains a record of the date and description of any changes made to its contents.

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Use of the Farm Register

- For administrative purposes
  - at aggregated levels
- For statistical purposes
  - selection of agricultural census and survey population
  - preparation, implementation of agricultural censuses and surveys
  - analysis of agricultural data
  - processing

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Linking registers

Problems

- identification
  (common code versus name/address)
- same definitions
- same content
- coverage
- etc.

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Units of the Farm Register in the Republic of Macedonia

- Business entities and units within the business entities, according the main activity distributed in the sector Agriculture, hunting and forestry, as well the entities and the business units within the entities according the main activity not distributed in the sector Agriculture, hunting and forestry, but do an activities in this sector.
- Individual agricultural holdings

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Individual agricultural holdings

- use one or more decars agricultural area
- use less then one decar or not use agricultural area, but possess:

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Individual agricultural holdings

- a cow and a calf or
- a cow and a heifer
- a cow and two raised heads small livestock
- 5 raised sheep or goats
- 3 raised pigs
- total of 4 raised sheep, goats or cows
- 40 heads poultry
- 20 bee families

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Business units

- Business entity - means all legal and natural persons that perform activities, in the area of Republic of Macedonia, registered by the competent authority in accordance with law, as well the organisational units of foreign society and foreign individual dealer that do activities on the territory of the Republic of Macedonia.

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- Local units within the business entities - means subsidiary or other organisational unit, organised with decicion of the business entity that organised it and could do all activities in the area of working of the business entity.

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Structure of the identification data for the individual agricultural holdings

- Identification number of the individual agricultural holding
- Data for the location of the individual agricultural holdings
- Sample - 5 variables with 4 positions
- Corrected variables for stratum, 5 variables with 4 positions
- Records in the single register of agricultural holdings in the Ministry of Agriculture
- Purpose of production
- Municipality where the holding is located
- Name of the municipality where the holding is located
- Settlement of the holding

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Structure of the identification data for the individual agricultural holdings

- Name of the settlement of the holding
- Name of the holder
- Surname of the holder
- Name of the holder's parent
- ID of the holder
- Municipality where the holder lives
- Name of the municipality where the holder lives
- Settlement of the holder

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Structure of the identification data for the individual agricultural holdings

- Name of the settlement of the holder
- Street
- Name of the street
- House number
- Appendix
- Doorway
- Flat
- Phone

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Structure on statistical data for individual agriculture holdings

Total used agricultural land
Used arable land and gardens
Kitchen gardens
Vineyards
Meadows
Pastures
Nurseries
Forest land
Other land
Total available land
Cereals
Industrial crops

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Structure on statistical data for individual agriculture holdings

Forage plants
Vegetables
Orchards
Cattle, female head
Cattle, male head
Sheep
Goats
Pigs
Poultry
Horse
Beehives

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Structure on statistical data for individual agriculture holdings

Tractor
Combine harvester
Agricultural machines and equipment
Vehicles
Additional activity in the holding
Processing on agricultural products
Working Activities on the manager in the holding
Education
Season workers in the holding
Gender on the holder

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Structure of the identification data for the Business entities

Identification number on the business entities
Name on the business entities
Identification number on the business entities
Ordinal number on the local unit
Municipality where the entities is located
Name on the municipality where the business entities is located
Settlement where the business entities is located
Name on the settlement where the business entities is located
Name on the street
House number
Settlement where agricultural area is located
Name on settlement where agricultural area is located

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Structure of the identification data for the Business entities

Telephone
Fax
Form of organisation on the business entities
Property on the business entities
Main activities on the business entities
Main activities on the local unit
Turnover
Manager
Capital
Size
Main activities (if is local unit)

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Structure on statistical data for Business entities

Total used agricultural land
Used arable land and gardens
Vineyards
Meadows
Pastures
Nurseries
Forest land
Other land
Total available land
Cereals
Industrial crops

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Structure on statistical data for Business entities

Forage plants
Vegetables
Orchards
Cattle, female head
Cattle, male head
Sheep
Goats
Pigs
Poultry
Horse
Beehives
Tractor

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Structure on statistical data for Business entities

Combine harvester
Agricultural machines and equipment
Vehicles
Total employed
Total employed-female
Total employed-male
Employed according to education
Season workers - total
Season workers-female
Season workers-male
Working hours on season workers-total

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Demographical characteristics

- **Date of establishment**
- **Liquidation, cessation**

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Other information

- **typology** (economic size, type of farming)

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Maintenance of the Farm Register

Sources

- Statistical censuses, surveys
- Administrative data sources
  - Land Use Register, livestock registers
  - IACS (Integrated Administration and Control System)
  - others

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Administrative sources

1. Administrative business register
2. Administrative register on agricultural holdings – Ministry for agricultural, forestry and water economy
3. Veterinary Office- register of bovine animal
4. Agency for Financial Support of Agriculture and rural Development

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Statistical sources

1. Agricultural census
2. Population census
3. Farm structure survey
4. Cattle survey
5. Annual cattle survey for business entities
6. Report for land and area under cultivation at the end of the spring seeding season
7. Annual report for business entities and agricultural cooperatives

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Quality assurance in FR

- relevance (info available for agricultural statistical use)
- accuracy: no duplications, all units are covered
- timeliness: updating frequency
- availability: unique ID and info, existing link between data source and users
- compatibility: with IT system [and other data sources -administrative]

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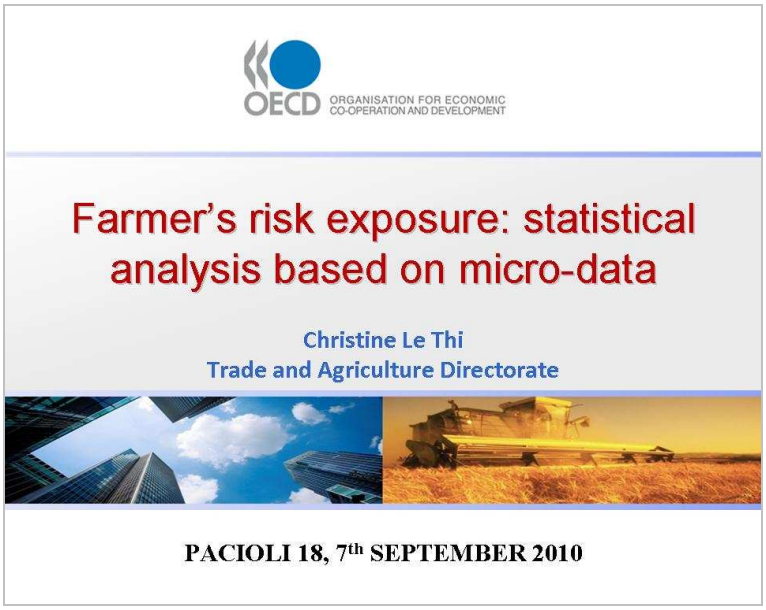
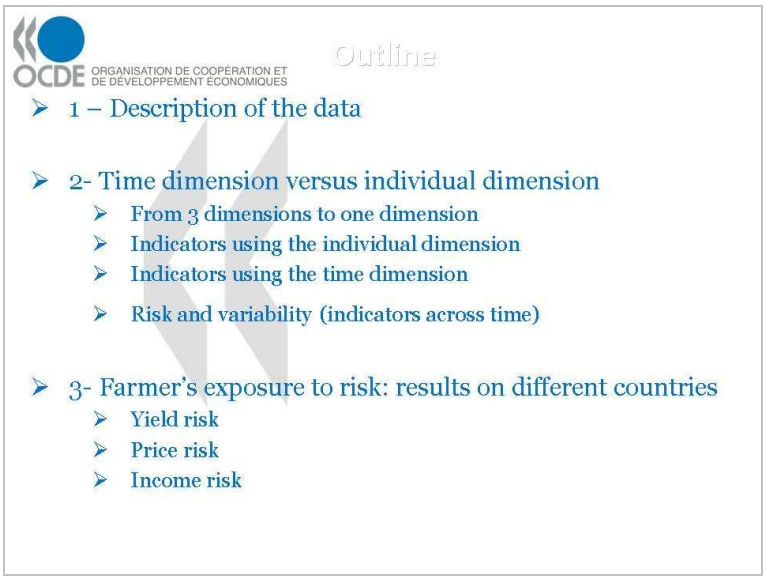
Thanks for your attention!

anita.stamnova@stat.gov.mk

12 Farmer's risk exposure: statistical analysis based on micro-data

Christine Le Thi, OECD



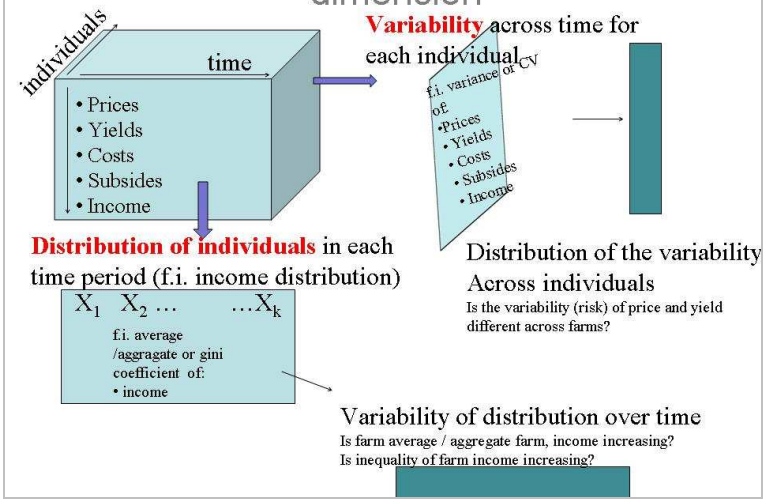


Description of the data

Country	Germany	The Netherlands	UK	Italy	Estonia	Australia	New Zealand	Spain
Farm type	Crop farms	Field crop farms	Cereal farms	Crop farms	Crop farms	Mixed farms (Broadacre farm)	Sheep and beef farms	Crop farms
Major commodity	Wheat, barley, oilseed and sugarbeet	Wheat, potato and sugarbeet	Wheat, barley and oilseed	Wheat, barley, oats	Wheat, barley	Wheat, oilseeds, oats, barley, cattle and sheep	Sheep, lamb, cattle and wool	Barley, wheat, olive, sunflower
Number of samples	232	97	96	1710	104	185	100	105
Length of the data	12 years	6 years	9 years	5 years	8 years	7 years	10 years	7 years

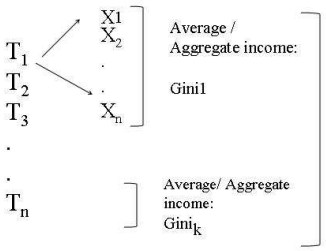
- 2- Time dimension versus individual dimension
  - From 3 dimensions to one dimension
  - Indicators using the individual dimension
  - Indicators using the time dimension
  - Risk and variability (indicators accross time)

Aggregation: from 3 dimensions to one dimension



Indicators using the Individuals dimension

- For each time period

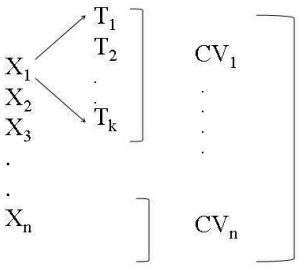


Individuals : X_1 to Xn
Time : T_1 to T_k

Average income and Gini in each time point: Variability of average / aggregate income or Gini over time

Indicators using the time dimension

- For each Individual:



Individuals : X_1 to Xn
Time : T_1 to T_k

CV at individual level: Representative (average) farm in terms of variability

Risk and variability (indicators across time)

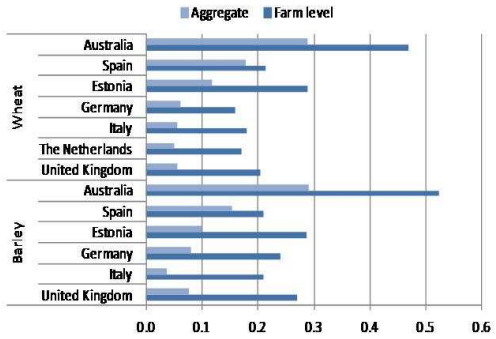
- Individual variability:
  - Calculated for each individual
  - F.i. the CV of yields in $farm_i$ or average (across individuals) CV (across time) of yields
- Aggregate variability
  - Calculated for aggregates of individuals
  - F.i. the CV (across time) of the average (across individuals) yield

OCDE ORGANISATION DE COOPÉRATION ET DE DÉVELOPPEMENT ÉCONOMIQUES

- 3- Farmer's exposure to risk: results on different countries
  - Yield risk
  - Price risk- which is larger price or yield variability?
  - Income risk

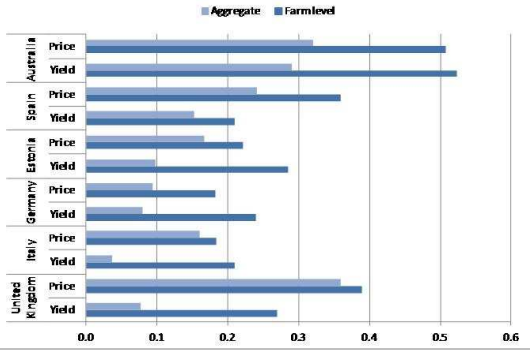
Farmer's risk exposure: yield risk

- Yield risk is, in many case, higher than price risk at the farm level.
- Aggregation spatial bias



Farmer's risk exposure: which is larger, price variability or yield variability?

- At aggregate level the variability of price is much higher than the variability of yield
- At individual level, it is not the case



Decomposition of farm income risk

Income risk is not only a sum of each component:

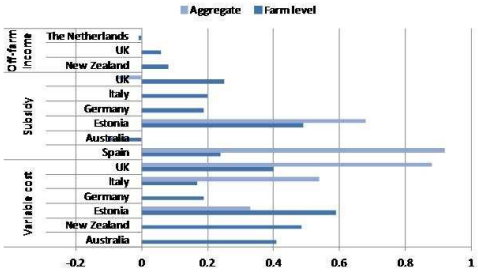
Taking into account the covariance terms is also important

Farm Cash Income (I) = Revenue (R) + Subsidy (S) – Variable Cost (C).

$$Var(I) = \underbrace{Var(R) + Var(S) + Var(C)}_{\text{Variance components}} + \underbrace{2Cov(R,S) - 2Cov(R,C) - 2Cov(S,C)}_{\text{Covariance components}}$$

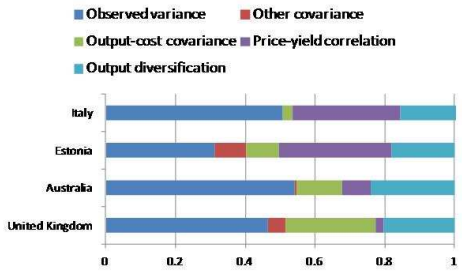
Exposure to income risk: Correlation within income components

- Some negative correlations can reduce the variability of income



Which risk management component is more important in stabilizing income?

- Comparing the variance of income of....
- 1) wheat monoculture with zero price-yield correlation
- 2) observed crop diversification with zero-price yield correlation
- 3) observed crop diversification with observed price-yield correlation
- 4) decomposition of observed variance of income



Conclusions

- The "time dimension calculation" is better adapted to measure the variability/risk exposure on individuals
- Assessing the farm's risk exposure at individual level shows that:
  - Yield risk is higher than the aggregated level and is equivalent to price risk
- Farm income risk can be reduced:
  - Correlations and crop diversification are stabilizing farm income

- References:

Farm level analysis of risk and risk management strategies and policies, OECD Food, Agriculture and Fisheries, Working papers n°26

Managing risk in agriculture: a holistic approach, OECD Food, Agriculture and Fisheries publication, publication (2009)

Thank You

Trade and Agriculture Directorate

Visit our website:

www.oecd.org/agriculture

Contact us:
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13 Income projections, exploring 2 methodologies

Hennie van der Veen
LEI

13.1 Introduction

Yearly, the LEI reports the income estimations of the current year. These estimates are based on preliminary results of the Dutch Farm Accountancy Data Network and price and quantity developments of agricultural inputs and outputs.

At LEI, we also have developed a micro-simulation model, which simulates the financial economic situation in the medium term (FES). Using the FES model for income estimation in the short term could have some advantages related to quality, efficiency and re-use of information.

13.2 Current methodology

At the end of every calendar year, LEI presents the income figures of that year. Since the data in the FADN is not so actual, estimations have to be made. These estimations are based on data of the last available year in FADN. Of groups of farms, the development of average revenues and costs are recorded in a spreadsheet. Additionally, the spreadsheet involves information about the structure of the average farms (such as area, crop rotation, stocking density and economic size), technical (kg yields, concentrate consumption, nitrogen) and economic outcomes (income, expenses, and revenues).

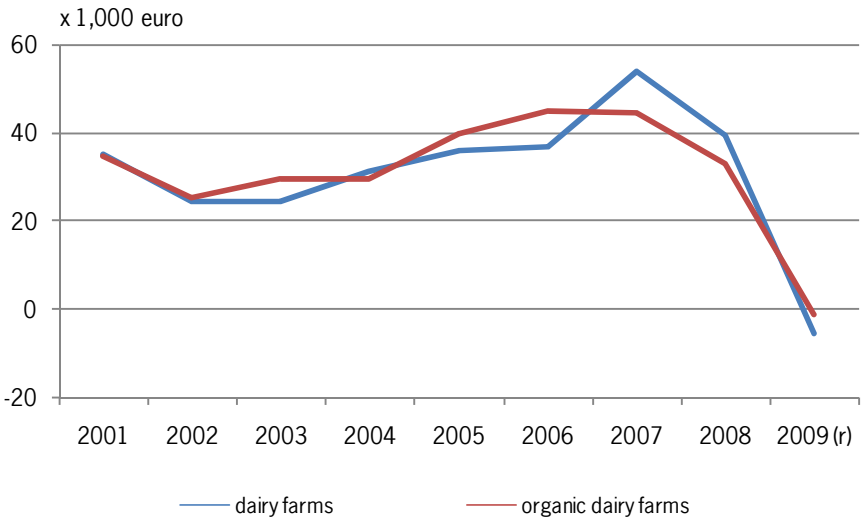
The revenues are divided in about 15 main groups, each divided into several smaller items which are important for individual business types, in about 150 posts. For the costs about 35 main groups are distinguished, further specified to more than 100 items. The development of revenues and costs are split up into quantity and price developments.

The price developments are all provided by one price specialist. The various agricultural sectors all have their own experts, which implies that several people are involved in this project. These experts provide information about the growth (for example the area) and quantity development (for example the kg's per hectare). The factors are not re-used by other sector specialists. For example the specialist for the pig sector determines the quantity development for the pigs. For other sectors, for example the dairy farms, this factor is not re-used. Although in some occasions, indicators at a higher level are exchanged between specialists. The costs are calculated the same way. Only averages for sectors are reported.

The current methodology is based on the use of spreadsheets. A few years ago a spreadsheet is developed with a main sheet that is centrally maintained. For some sectors, specific sheets are developed, with sector specific calculation rules. Central maintenance of the total file is consequently not possible. In the longer term the use of various spreadsheets is difficult to control.

Figure 13.1 shows one of the figures in the report on income estimations. The years 2001-2008 are based on FADN data, while the year 2009 is estimated using the above described methodology.

Figure 13.1 **Farm Income of dairy farms 2001-2009**



Source: LEI, Actuele ontwikkeling van resultaten en inkomens in de land- en tuinbouw in 2009.

13.3 The FES model

Based on FADN-data, LEI has developed an instrument for financial analysis of agricultural economic developments and policies: the Financial-Economic Simulation model (FES). The FES model has proved to be a reliable instrument for answering questions about possible future economic developments in agriculture.

Some examples of those questions are:

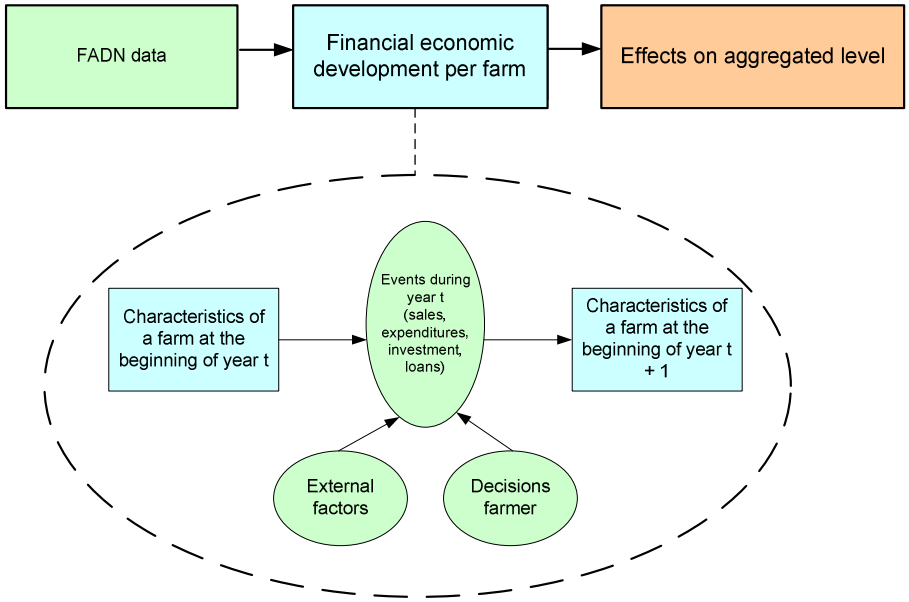
- How many of the agricultural and horticultural holdings have a large chance to meet financial difficulties in the near future?
- What characteristics of agricultural and horticultural holdings determine their chance on survival?
- How does a change in fiscal policy or agricultural policy modify the financial perspectives of agricultural and horticultural firms?
- What are the effects of declining market prices on the income of agricultural firms?
- What are the effects of high energy prices on perspectives of the greenhouse sector?

Accounting is a reflection of the development of a firm in the past and its development in the future. Accounting is therefore an excellent framework for analysing the development of a firm. By means of simulation of the various possible yearly events, financial characteristics of a firm are updated from year to year (see Figure 13.2). The events during the various years and the financial characteristics at the beginning of each year are reflected in the profit account and the balance sheet respectively. The financial characteristics of a firm consist of the value and composition of assets and liabilities and the modernity of the assets. The modernity of the durable assets is determined by ratio of the book value of those assets and the market prices for new durable assets.

Examples of the yearly events which are simulated are farm expenditures, sales of products, tax payments, family expenditures, off-farm income, investments and loans. The events during the years are the result of a) the characteristics of the firm at the beginning of the year, b) the developments in the environment of the firm (e.g. in the sales market, the capital market and government policy) and c) the decisions of the farmers.

FES simulates each farm in the FADN database and scales the results up to relevant aggregates. FES simulates on a yearly base, and the standard simulation period is between 5 and 10 years ahead. Although the original FES model only worked for the Dutch FADN, the latest version was developed for all FADN countries. In 2008, the model has been used for calculating the EU 15.

Figure 13.2 **FES is a discrete-event simulation model**



Revenues and costs

The revenues and expenditures are determined by adjusting the technical and economic results reported by the FADN for assumptions concerning the development of prices and productivity and other external circumstances like government intervention. The revenues and costs of the base year are calculated as a three-year average (normalisation). Prices are modelled as relative changes in revenues and not as absolute prices. The yearly cash flows consist of the farm expenditures, the sales of products, the financial expenditures, the tax payments, the family expenditures and the off-farm income.

Investment and financing

After calculating the operational cash flow, investment options are evaluated for the farms. In order to be able to continue his farm, the farmer has to invest in replacement of the durable assets from time to time. In FES it is assumed that the farmer's wish to replace increases when modernity of the assets declines. The farmer's wish to invest depends also on the age of the youngest farmer: older farmers invest less in their farm.

Other relevant investment options are not calculated within FES. It is however possible to determine them outside the FES model. For example, in many applications of the model the question is answered whether or not firms are able to finance certain environmental or animal welfare investments. In that case, the legislation is translated to investment wishes for the individual sample farms.

Investment options are compared with the available internal financial resources. If those are sufficient, investment takes place. Otherwise, the possibility of borrowing is considered. For this reason the behaviour of banks with respect to the finance of agricultural firms is modelled within FES. If cash flow, solvency and collateral are sufficient, financing and investment takes place and the best investment option is chosen.

Liquidity problems

In case of liquidity problems the farmer is assumed to postpone redemption of loans. If that is not sufficient, the farmer can apply for an assistance loan. In case that the amount of liquidities is reduced to zero and an assistance loan is already applied for, the farm is technically bankrupt.

Output of the model

The FES model is a financial economic simulation model. The main output variables are related to financial economic indicators such as income, solvency and the modernity of assets. Additionally information about the perspective of the farm is deducted from these indicators. The following categories are distinguished:

1. Excellent prospects. The farm has sufficient financial means to finance the necessary replacement investments. But also possibly mandatory investments or expansions can be financed;
2. Good prospects. The farm has sufficient financial means to finance the necessary replacement investments;
3. Acceptable (average) future. The farm still has liquidities available; however it has trouble financing the necessary replacement investments;
4. Very moderate future. Company has financial trouble. Good management and adjustments in spending could save this farm for the future;
5. Quitting farmers with a good company (retiring, good): no liquidity problems. Desired replacements, which are limited given the fact that the farmer will stop, cannot be financed in all cases;
6. Quitting farmers with a less good company (retiring moderate): farm has liquidity problems;
7. Poor future (bad): big chance that this company will stop for financial reasons;
8. To translate individual farm outcomes to sector or national level, weights are used. Since individual farms are simulated, aggregation to different sectoral or regional levels is easy as long as enough farms are within the relevant sample.

13.4 Using FES for income projections

Using the FES model for income projections would imply some advantages compared to the current methodology:

- The use of 1 model for all sectors is much more transparent and implies uniform calculation rules.
- The use of a central model implies that the factors will be re-used for the other sectors;
- Using the FES model broadens the applicability of the model and no maintenance of the separate spreadsheets is necessary;
- Using the FES model would make it possible to report for non-standard groups since individual sample farms are simulated;
- The current FES model has been developed in GAMS, which is a modelling language which is very transparent and efficient. The FES model is one of the main models of LEI. The quality of the model will be guaranteed by standard working procedures, audits and reviews;
- Maintenance of various versions can easily be organised.

Discussions with researchers taught us that for a successful use of the FES model for the income projections, some conditions have to be met. These conditions are related to the input data, the user interface, the FES model and the output. Some additional features will be developed in a later version of the model. The focus is on a simple model that can be extended later on.

13.4.1 Input data

At the beginning of the project, the FADN data are exported from the database to the spreadsheet once a week. At the end they are exported twice a week. The exports are used to check whether the output is correct and no mistakes are made in collecting and entering the data. The process of exporting the data from the database to the FES model should consequently be very efficient.

13.4.2 User Interface

Since a number of researchers has to be able to use the FES model without having the experience of running the FES model a good user interface has to be developed. This user interface has to have the following features:

Changing the price and quantity factors in the calculation can be done in 2 ways: importing a complete spreadsheet and changing individual factors. Not everyone can change all factors, so this has to be authorised to certain persons.

The growth factors are once determined based on the provisional national Census and is consequently not a very important element in the user interface.

Some factor apply to all sectors, others will be farm type specific.

The user of the model should be able to exclude certain FADN sample farms if necessary. For example if the results are still unreliable or if they strongly influence the averages.

It should be clear to the other researchers if anything has changed in the input data, the factors or in the model.

For individual researchers it must be possible to run the FES model with a test version of the factors, without influencing the central database with factors.

The history of the factors must be preserved.

A first prototype of the user interface has been developed. Figure 13.3 shows some screens of this user interface.

Figure 13.3 **Prototype of user interface**

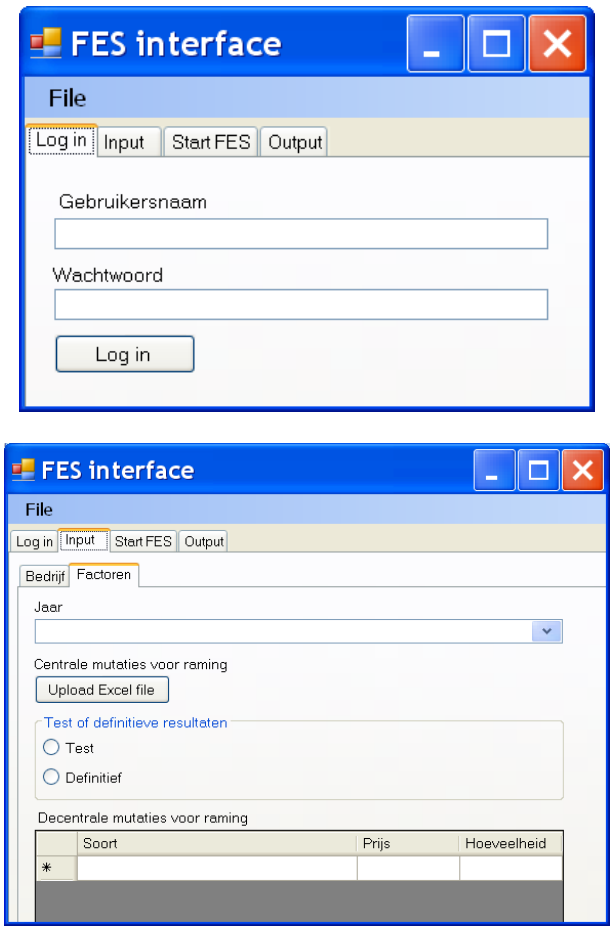
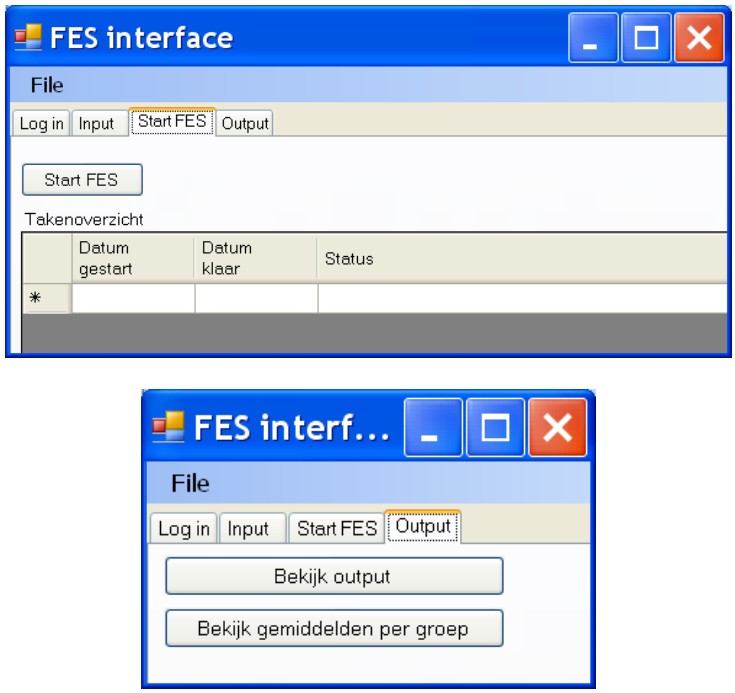


Figure 13.3 **Prototype of user interface (continued)**



13.4.3 FES model

The current FES model only simulates financial economic development at firm level. For some sectors, additional calculations are made in the spreadsheets. These additional calculations will not be included in the first version. However, it should be possible to model this at a later moment.

13.4.4 Output

The user interface will show the output of the FES model to the researchers. The following features are necessary:

- In the current project, the whole process of generating income projections and the publication of these data is closely connected to each other. Later on, this will also be generated by the FES model. At this moment the output will be limited to the GDX-file of the GAMS-model.
- Another wish is to generate output at various levels. Not only average income at farm level will be available, but also data per animal or per hectare. Researchers must be able to choose the report level.
- By using the micro data, output for different groups can easily be generated. One can think of different size categories, regions, et cetera.
- It must be possible to generate outcome for single farms, to check the results.

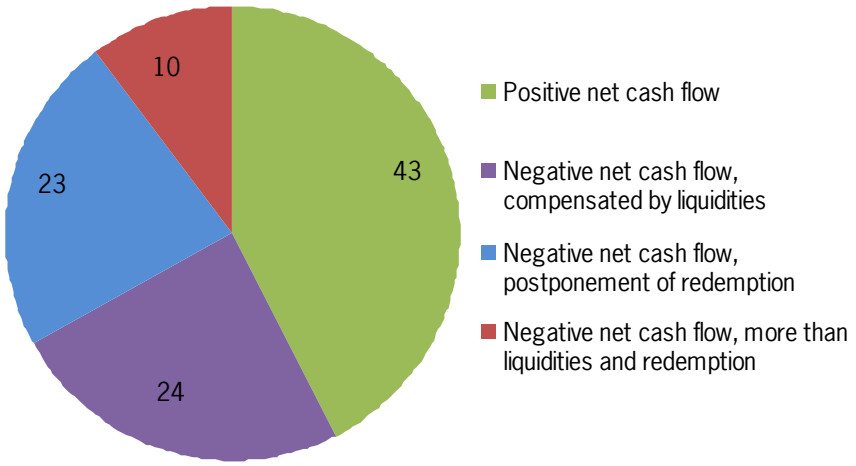
13.5 Experience of last year

13.5.1 Liquidity problems

In 2009, an additional analysis is made for the income projections project based on FES calculations. Based on the price and quantity factors, the net cash flow for every sample farm is calculated. The FADN data of the year 2008 is used as input and the net cash flow of 2009 is simulated. The net cash flow is calculated as the savings plus depreciation minus redemption. For every farm in the database, it is determined whether:

- The net cash flow is positive;
- The net cash flow is negative, but the farm has enough liquidities to compensate the negative net cash flow of this year;
- The net cash flow is negative, but the farm has not enough liquidities to compensate the negative net cash flow of this year, but by postponing the redemption, the negative net cash flow is compensated;
- The net cash flow is negative and the farm is not able to compensate this with liquidities or postponing the redemption.

Figure 13.4 **Distribution of net cash flow of dairy farms (2009)**



Source: LEI, Actuele ontwikkeling van resultaten en inkomens in de land- en tuinbouw in 2009.

13.5.2 Income projections

Although for the report, only the information about the net cash flow has been used, the farm income is also available. The simulated income and the actual income in 2009 (for the farms that are already completely recorded for the year 2009) are compared (Figures 13.5 and 13.6). For both the greenhouse and dairy sector the predicted and actual income are highly correlated. However, the greenhouse sector shows some outliers for which the simulated income is much lower than the actual income.

Figure 13.5 Simulated and actual income from normal operation of dairy farms

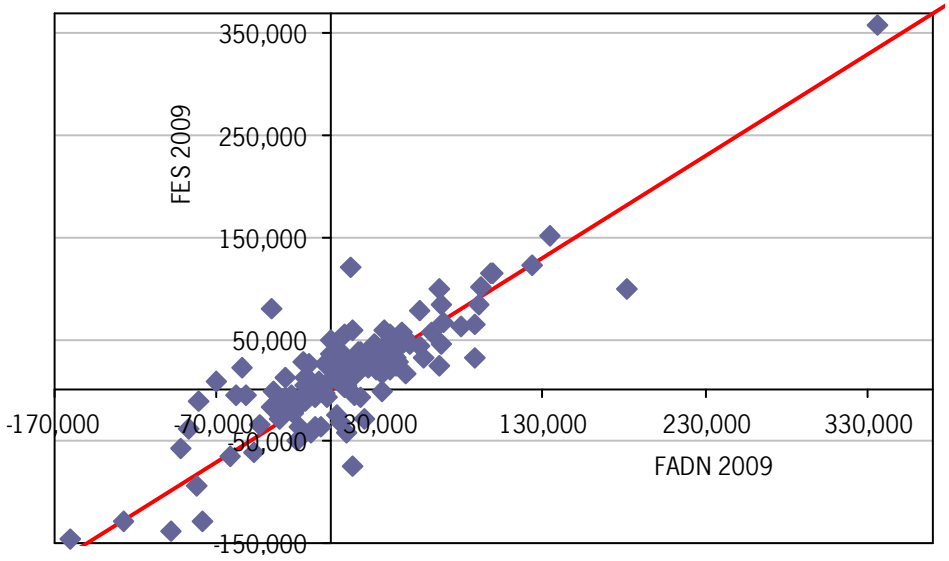


Figure 13.6 Simulated and actual income from normal operation of greenhouse horticulture firms

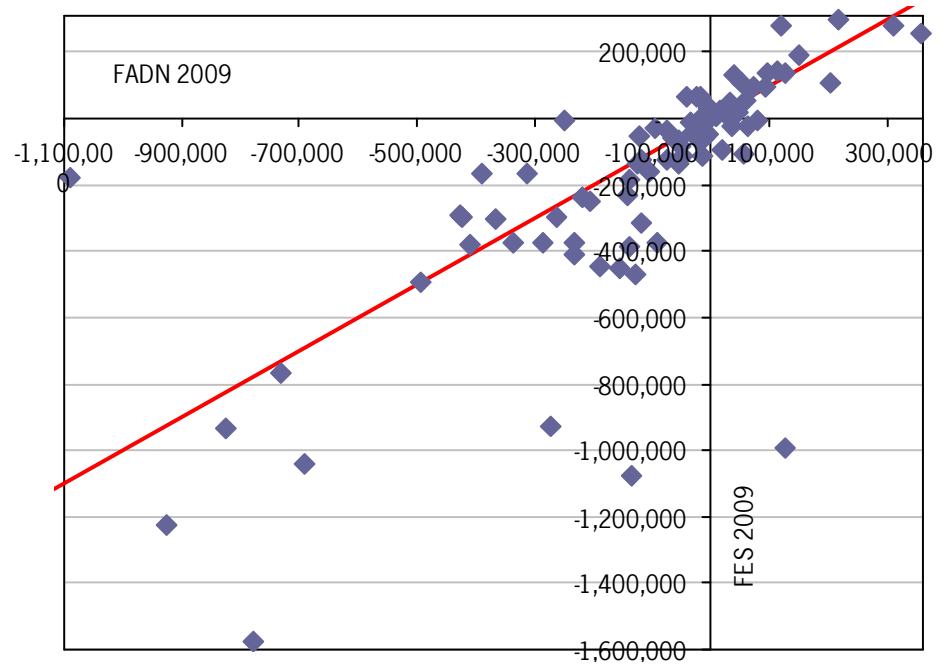


Table 13.1 shows some statistics for these predictions. Only the farms that are already completed are included in the analysis. In general, the predictions for the dairy sector are better than the predictions for the greenhouse sector. This is not very surprising, since the dairy sector is a much more homogeneous sector. In the greenhouse sector a number of different products are distinguished for price and quantity developments, while in practice much more different species are produced (for example other colours, varieties) The correlation between the predicted and the actual income is 86% for the dairy sector and 72% for the greenhouse sector. The average income for the dairy sector shows a difference between the prediction and the actual income of about 6.000 Euro. However the difference for the greenhouse sector is about 70.000 Euro. The greenhouse sector showed a large decline in income, which seems very hard to quantify.

The prediction of the income in Figure 13.5 is based on the complete sample using weighting factors. The figures in Table 13.1 are based on an unweighted subsample of completed farms. It is therefore not possible to conclude anything about which of the 2 methods is best. Later this year, when the complete sample is completed, we have more information about this.

Table 13.1 Statistics of predictions (subsample of completed sample farms, 1 outlier excluded)

	Dairy	Glass
Correlation 2009 (FES) - 2009 (FADN)	86%	72%
Mean 2009 FADN	11,800	-107,400
Mean 2009 FES	18,100	-176,300

13.6 Discussion

13.6.1 Distribution versus averages

At this moment the income projections are based on averages of groups. These averages are imported in the spreadsheets and the price and quantity factors are used to calculate the new costs, revenues and derived income. However, at individual level, the developments might differ from the mean development. This has no effect on average outcomes. But if we want to show the distribution of the income, or other financial indicators, it is relevant whether the estimated distribution is valid.

The correlations between the agricultural income of one year and the income of the following years tells us something about whether 'good farmers' are always 'good farmers' and whether 'bad farmers' are always 'bad farmers'. If for example in 2 following years for all farmers the income is doubled, the correlation will be 100%. If however it will be much lower if 'good farmers' also can be less 'good' in another year.

Table 13.2 shows some statistics related to the distribution of the income. For both the dairy and greenhouse sector, the correlation between the prediction of 2009 and the actual income of 2008 is much higher than the correlation between the actual income in 2008 and 2009. For the income projections, this would not be a big problem,[1] if the spread of the income is comparable between the predictions and the actual income. For the dairy sector, the spread is about the same. For the green house sector, the spread is somewhat larger. However, these figures are only based on the results of one year, which shows very extreme developments. Before we would actually use the distribution of the sample, more research about the validity is necessary.

Table 13.2 Statistics of distribution (subsample of completed sample farms)

	Dairy	Glass
Correlation 2008 (FADN)-2009 (FADN)	68%	52%
Correlation 2008 (FADN)-2009 (FES)	81%	86%
Standard deviation 2009 (FADN)	55,900	258,600
Standard deviation 2009 (FES)	56,300	348,300

[1] For the mid term simulations, this assumption is much more relevant. If FES makes predictions about the number of farms going bankrupt, the number will be much higher if 'bad farmers' will be 'bad farmers' every year. Years with low or even negative incomes will not be easily compensated in other years.

13.6.2 Growth and change in produced products

In the current FES model, the size of the farm and the cultivated crops and the livestock are constant. In practice, the average size of the farms grows and the cultivated crops change yearly. A number of options are available to take this into account:

- The FADN is a stratified sample of the Census. The weighting factors of the farm in the sample of year t are based on the Census of year t. Since at the moment that the income projections are made, the Census of year t+1 is known, new weighting factors for t+1 can be calculated. Since in practice, the number of larger farms increases and the number of smaller farm decreases, larger sample farms will get a higher weighting factor. However, the underlying growth of that year is not simulated by the FES model.
- The alternative is to use the individual growth figures from the national Census of the year t+1 compared to t. Yet this places us for another problem. The FES model assumes that the size of the farms stays the same. If a farm grows, not only the output increases, but also the inputs. An option would be to make a selection of the variable costs which will then be adjusted with the same growth factor as the outputs.
- Changes in the production plan are also related to changes in the costs structure. This cannot easily be implemented, since many changes can take place. No general rule for adjusting the cost structure is yet available.

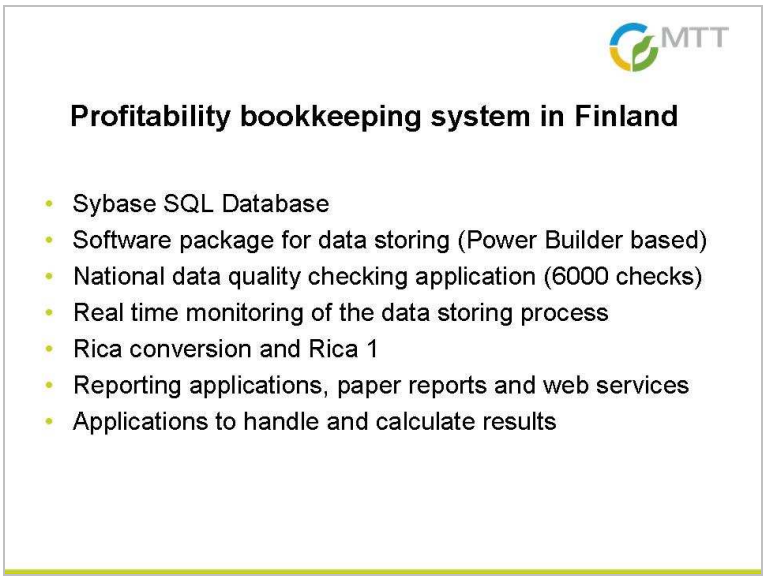
13.7 Literature

Mulder, M., *Bedrijfstakverkenning en financiële analyse: Een simulatiemodel voor de glastuinbouw*, Research report 126, LEI, The Hague, 1994.

Bont, C.J.A.M. de, W.H. van Everdingen, A. van der Knijff and H.A.B. van der Meulen, *Recent developments in the results and incomes realised in the agricultural and horticultural sectors, 2009*, Report 2009-088, LEI, The Hague, 2009.

14 Data dissemination in Finnish FADN - Current situation and plans for the future

Arto Latukka
MTT Economic Research, Finland



Applications in Finnish FADN-application

- FADN Typology application
- Weighting application
- Simulation application
- Forecasting application
- Comparison report application
- Forecast-Comparison report application

Data/results dissemination to FADN -farms

- Financial Statement
- Comparison report
- Forecast-Comparison report
- Results and benchmarking results from the Agriculture and Horticulture web service (www.mtt.fi/economydoctor)

Data dissemination to FADN Unit /Researchers

- Research Data to Researchers
- Data to FADN Unit

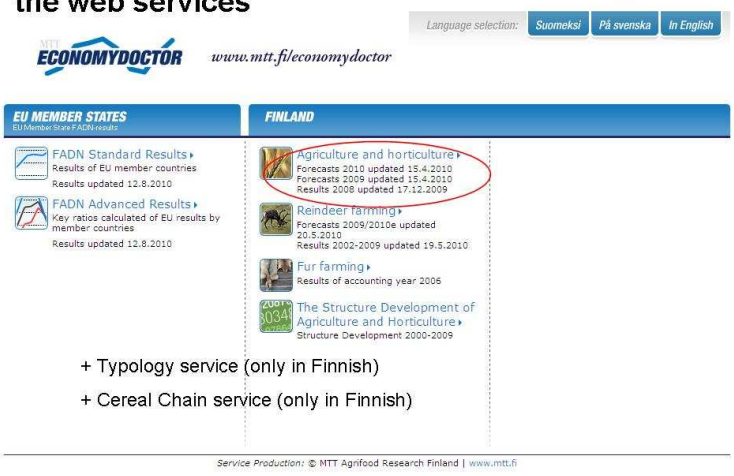
Own research projects and support to political decision making based on profitability bookkeeping/FADN –data

- Policy analysis and studies (small studies)
- Answering for Ad hoc -questions (small analysis)
- Results (averages, dispersions) with different classifier factors
- Simulations with different kind of assumption (averages results, dispersions)
- Forecasts with different kind of assumption (averages results, dispersions)

Results dissemination via EconomyDoctor -web services (www.mtt.fi/economydoctor)

- Agriculture and Horticulture –web service
- Reindeer husbandry –web service
- Fur Animals –web service
- Typology –web service
- Structure Change –web service
- Cereal Chain –web service
- FADN Standard Results -web service
- FADN Advanced Results -web service

EconomyDoctor internet site and the web services



+ Typology service (only in Finnish)

+ Cereal Chain service (only in Finnish)

Agriculture and Horticulture –online service in EconomyDoctor –internet site (public version: www.mtt.fi/economydoctor

- Public Web -service
- Average results and forecasts 1998 – 2010forecast
- Dispersions of the farms (weak/average/strong -groups) from the "Own criteria"
- With the username and password farmers get:
  * their own results
  * their own results with the average results of the farm groups selected by the farmer (benchmarking)
  * their own results with the results of groups: weak/average/strong.
- Language versions: english, swedish and finnish

Time series from the Agriculture and Horticulture web service of EconomyDoctor

ECONOMYDOCTOR *A tool for monitoring the profitability of agricultural enterprises*

1998-2010e | 2008 | 2007 | 2006 | 2005 | 2004 | 2003 | 2002 | 2001 | 2000 | 1999 | Own criteria | Info

Income Statement
Family farm income by support area
Entrepreneurial profit by support area
Profitability ratio by support area
Family farm income by Production Type
Equity by Production Type
Labour hours by Production Type
Entrepreneurial profit by Production Type
Profitability ratio by Production Type
Profitability ratio by Production Line
Return on Asset-% by Production Type
Utilized area by Production Type
Livestock units by production type

Family farm income by Production Type

Source: Profitability bookkeeping results of MTT Economic Research (www.mtt.fi/economydoctor)

Family Farm Income	2010e	2009e	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998
Cereal Farms	3 130	1 640	7 250	22 700	10 500	5 800	6 940	8 440	12 300	10 700	13 100	4 190	6 950
Other Crop Farms	11 900	11 800	12 300	22 600	13 300	13 000	12 700	12 400	16 100	16 200	12 700	13 100	11 300
Horticultural Farms	23 100	19 400	16 400	27 100	23 400	20 000	22 700	24 900	22 200	17 300	19 400	16 500	14 700
Dairy Farms	43 000	42 300	41 600	36 900	31 600	29 200	32 100	30 700	29 700	28 000	26 900	22 000	19 700
Cattle Farms	21 200	18 800	8 780	23 800	15 600	21 100	19 300	18 000	17 100	30 300	29 900	15 900	11 200
Pig Farms	34 600	33 000	15 800	46 400	34 700	42 000	31 700	24 400	34 200	38 200	32 000	22 000	24 400
Other Farms	17 900	17 000	4 370	24 700	9 390	23 700	20 900	24 500	6 530	27 900	15 000	55 900	15 900
Mixed Farms	29 700	22 100	16 100	23 200	22 100	22 500	18 500	17 700	25 500	21 700	23 500	14 500	14 200
All the Farms	19 400	18 800	19 300	27 700	20 300	18 900	19 800	20 000	22 000	21 500	21 500	16 300	15 200

Service Production: MTT Agrifood Research Finland | www.mtt.fi/english

Selection of reports in the Agriculture and Horticulture web -service

MTT

Own Criteria selected:

Begin with selecting report

Income Statement | Averages | Logout | Change password

Income Statement
Financial Ratios
Balance Sheet
Return Specification
Arable Land
Costs Specification
Livestock
Liquidity
Working Hours
FADN results
Subsidies

resentation and a variable for the base of the 'weak vs. strong' comparison

fiers and their values and Generate report
be selected by holding down CTRL key on keyboard while selecting

1. Classifier

Accounting year	2008
Subsidy Region	2007
Rural Advisory Center	2006
County	2005
FADN Region	2004
Production type	2003
Production line	2002
Economic size	2001
Rural Areas	2000
Region (Nuts2)	1999

Select additional classifier | Select all | Generate report

Selection of reports in the Agriculture and Horticulture web -service

MTT

Financial Ratios | Averages | Logout | Change password

Select up to five classifiers and their values and Generate report
Multiple classifiers can be selected by holding down CTRL key on keyboard while selecting

1. Classifier
Accounting year > 2008 - 2007

2. Classifier
Production type > Dairy Farms Change option

3. Classifier

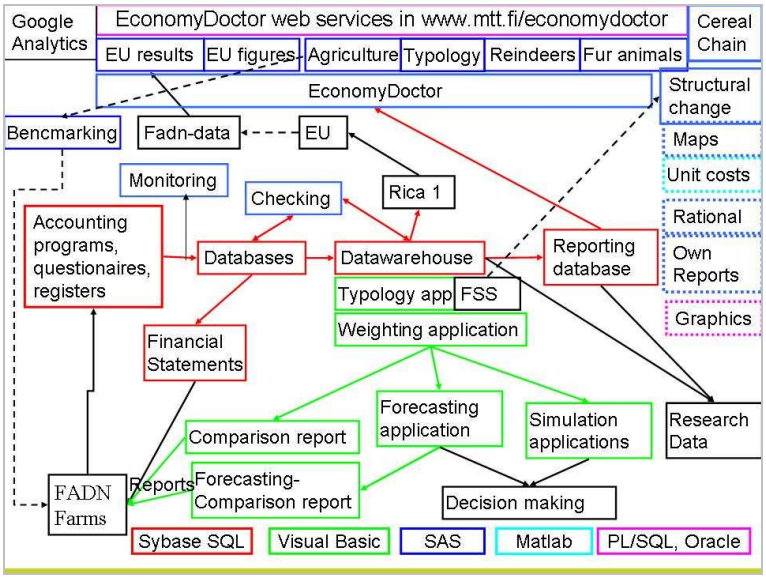
Rural Advisory Center	Small
County	Rather small
FADN Region	Average
Production line	Rather large
Economic size	Large
Rural Areas	Very large
Region (Nuts2)	Extremely large
Less Favoured Areas	
Production method	
Province	

Select additional classifier | Select all | Generate report

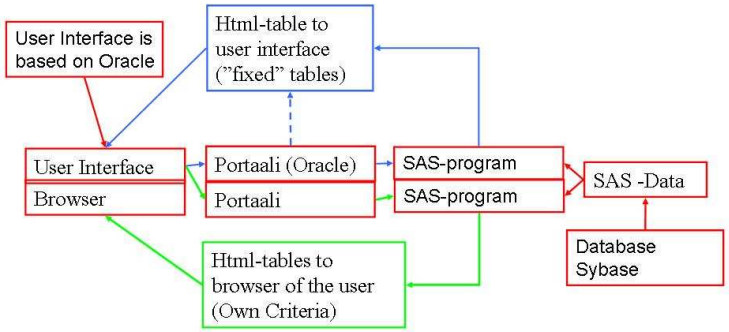
Financial Ratios	2008 Dairy Farms Large	2007 Dairy Farms Large
Farms represented	3 600	3 770
Farms in sample	130<n<140	130<n<140
Arable land	62	63
Entrepreneurial Profit	-23.281	-25.438
+ Wages Claim	60.960	61.066
+ Interest Claim	18.135	17.281
= Family Farm Income	**55.815**	**52.909**
Profitability Ratio	**0.71**	**0.68**
Return on hour of family work	9,2	8,5
Return on equity %	3,5	3,4
Family Farm Income	55.815	52.909
- Interest Claim	-18.135	-17.281
=Earnings	**37.680**	**35.628**
Hours of family work	4.689	4.847
=Hourly earnings	**8,0**	**7,4**
Equity	378.175	364.890
Total assets	548.016	526.887
= Equity ratio	**69,0**	**69,3**
Net Result	1.416	-1.921
Total assets	518.492	490.916
=Return on assets %	**0,3**	**-0,4**

EconomyDoctor –web services

- Flexible and fast application
- Based on Standard SAS Statistical package and normal procedures
- The application constructs the report table each time request is done by the user
- Weighting is calculated each time based on FSS and selected region-classifier, production type and size classification
- Easy to update the reports, variables, classifiers
- Easy to insert new reports, variables, classifiers
- Averages/weak/strong -groups (upper/lower quantiles also included)
- The power of SAS is available to statistical analysis



Technical aspects of EconomyDoctor



Under construction to EconomyDoctor web –services

- Unit cost application –web service
  - 77 products and 536 cost items
  - Unit costs are calculated for each production type
  - Results can be observed based on different classifiers (regions, accounting year, size class)
  - Application is made with SAS and Matlab
- Map production –web service
  - Any financial ratio or ratios from different reports can be selected
  - Region-classifier can be selected among many possibilities
  - Production type and size class can be selected
  - Map is constructed based on the requests of the user
  - Application is made with SAS
- Graphics service application –web service
  - Basic graphics figures is constructed automatically for each basic figure table
  - Application is made with graphics application based on Oracle Database

15 How pleased are farmers with the Flemish FADN?

Sanne Bouters[1]

15.1 Abstract

The Flemish FADN conducted a survey in 2009 on the contentment of the Flemish FADN (=FL-FADN) farmers in order to provide answers to several central questions and to set out future adaptations. The survey was set up to answer questions such as: what are the most valued benefits of being a FL-FADN farmer and how do the FL-FADN farmers see the data delivery in the future and which data feedback do the participants value the most and do they differ per sector. The results point out the strengths of the current FL-FADN and indicate which actions would be most appreciated by the participants to improve the FL-FADN. Furthermore, the survey gave an insight in the interest of the FL-FADN farmers in future developments in data collection.

15.2 Introduction of the Flemish FADN (FL-FADN)

In 2002 the federal agricultural authorities in Belgium were reformed and split in a Flemish and a Walloon division. The Flemish FADN (FL-FADN) was started up in 2005 publishing its first results on financial year 2004.[2]

Last year the FL-FADN consisted of 770 agricultural and horticultural holdings across Flanders. The amount of specific types of farming selected for the FL-FADN is based on a selection plan. This selection plan indicated the number of holdings that should be selected for each type of farming and dimension class in order to estimate the family income for each type of farming with the same and maximal precision.

Every holding is appointed to an accountant who visits the holding regularly in order to collect all the data needed for the FL-FADN accounting. The data can also be collected by other means; by telephone, by mail or by post. On average the data gathered by the Flemish FADN accountants is more detailed (e.g. on use of pesticides, water, nutrients and technical data) than required by the EU-FADN. This means that farmers looking to join the FL-FADN must be willing to deliver more detailed information than they would when joining private accountancy companies.

In Flanders farmers can receive investment support for certain types of investments from the Flemish Agricultural Investment Fund (Vlaams Landbouwinvesteringsfonds, VLIF). The amount of support that is given depends on several factors such as sustainability, type of holding (e.g. biological) or use of renewable energy. In order to receive this support, agricultural and horticultural holdings have to present an accounting with production figures of their business proving their financial profitability. A lot of FL-FADN farmers joined the FADN to have an accounting which is legitimate for receiving this investment support.

The Flemish FADN offers their participants (farmers) three main services. First of all the FADN farmers receive a Individual Business Report or IBR with the results of the accounting of their farm. This report contains a combination of crop yields and financial results of a specific accounting year. Together with the farmer, the FADN accountant reviews the IBR in order to find the strengths and weaknesses of the farmers' holding.

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[2] Cfr. presentation; 'A new farm accountancy data network for Flanders (Belgium)' by E. Van Broekhoven on Pacioli 2008.

Secondly the farmers receive a Comparing Business Report or CBR in which they can find their own results and those of other FL-FADN holdings. The number of holdings and the base of comparison differ from activity to activity. For dairy cows for instance the base of comparison is the amount of fat protein corrected milk and the number of cows. Only for activities present at at least six different holdings, a comparison is made. As a result approximately ten holdings, with rare activities, currently receive no CBR. In a holdings' CBR a selection of specific costs and activity outputs of the holding, are compared to the percentiles[1] based on the results for the same activity at the other holdings of the FL-FADN.

A third benefit is the FL-FADN newsletter informing the FADN participants about publications and researches based on the FL-FADN data.

15.3 Methodology

In 2009 the Flemish FADN conducted a survey to monitor the satisfaction of its participants. Each of the 770 FL-FADN farmers received a form with a list of mainly multiple choice questions. The possible answers to the statements in the survey were: I totally disagree, I disagree, I have no opinion, I agree and I totally agree.

To maximise the honesty of the answers the return of the survey was anonymous. Therefore the question list starts with questions on basic information about the farmer and his business such as the farmers' age, province and sector. This information makes it possible to group the forms based on the responses on the first set of questions for analysis purposes.

15.4 General questions

The response rate of this anonymous inquiry was a first indicator of the cooperation of the FL-FADN farmers; about 75% (568) sent the form back voluntarily.

The first group of questions gave us an idea of the reason why the farmers joined the FADN. The results showed that 84% of the respondents are obliged to keep an accounting in order to receive investment support. 69% agreed with the statement that they joined the FL-FADN because the accounting is free of charge. 89% are a participant of the FL-FADN to have a better view on the financial performance of their holdings whereas 70% joined the FL-FADN to help collect accurate data on their sector.

Because there is a big difference between the tax accounting and the FL-FADN accounting, it is very important that a FADN farmer truly believes that his FADN data will be processed completely anonymously without any traceability by users of the FADN data.

About 80% of the respondents believe that their data is processed anonymously by the FL-FADN and 17% do not have an opinion on the matter. Almost all (99%) of the respondents say they always answer the questions of their FADN accountant completely honest.

The results showed that 17% of the farmers believe the efforts asked from a FADN participant do not outweigh the benefits and a quarter does not have an opinion. However, 57% do not agree with this statement and thus value the results they get higher that the effort it takes to provide the information.

A large majority (95%) is satisfied with his collaboration with the FL-FADN. About 75% of the farmers are convinced that the figures published by the FL-FADN are correct, whereas 3% of the farmers are not convinced of the correctness, leaving 22% without an opinion.

When asked whether the farmers believe that their colleagues report everything correctly, only 44% of the farmers answer with 'yes' but nearly the same amount doesn't have an opinion on this statement and 8% of the farmers answer with 'no'.
More than half of the respondents (56%) claim they advise their colleagues to join the FADN accounting.

[1] The percentiles P25, P50 and P75 show us the economical and technical results of the 25th, 50th and 75th holding in a total of 100 holdings when all holdings are ranked according to this specific economical or technical result. This doesn't mean there are 100 holdings in the group. The results of the businesses in this group have been extrapolated to a 100.

15.5 The FADN newsletter and business reports

As mentioned earlier the FL-FADN offers their participants three main services: a Individual Business Report, a Comparing Business Report and a FADN newsletter. To evaluate these three services the survey contained three clusters of question on each of these topics.

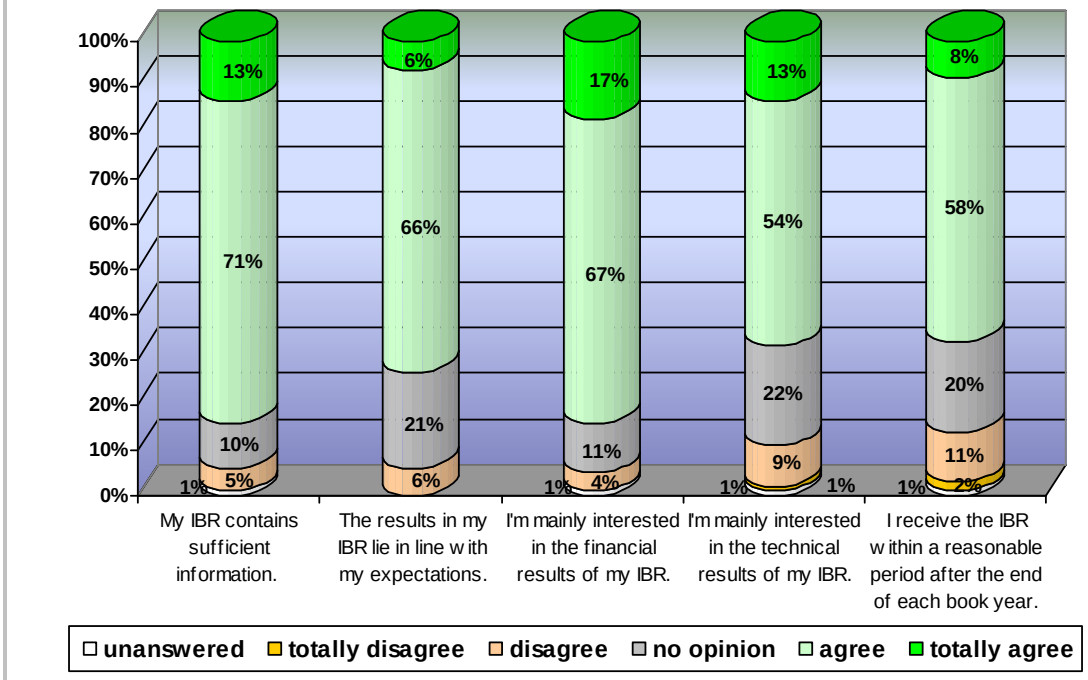
15.5.1 The Flemish FADN newsletter

More than 70% of the respondents say that they read the FADN newsletter while 9% do not. The newsletter informs 64% of the participants on what the FADN data is used for. Only 4% of the farmers would like to receive more than 2 editions of the newsletter each year, 73% are pleased with an edition every six months.

The majority does not have an opinion when asked if they would like to see more information in the newsletter (yes: 28%; no: 15%). 56% of the respondents indicated that the newsletter is interesting to read and 6% do not.

15.5.2 The Individual Business Report or IBR

Figure 15.1 **The Individual Business Report**



The IBR seems rather difficult to understand for 15% of the FL-FADN participants, this is in contrast with the 76% that have no difficulty with understanding the IBR.

Despite the fact that 84% joined the FL-FADN for the main purpose to comply with the conditions to receive investment support, only 6% do not study the results published in their IBR. This means that more than three quarter study the results published in their IBR. Furthermore nearly half (47%) of the respondents confirm that they adjust their business management based on the results published in the IBR, 22% do not.

More than 75% say they use their IBR to find the greatest cost posts of their holding and try to reduce them if possible. Only 11% do not analyse their IBR!

Another positive result is the fact that 96% claim to report everything concerning their FADN accounting completely correct, merely 0.53% do not.

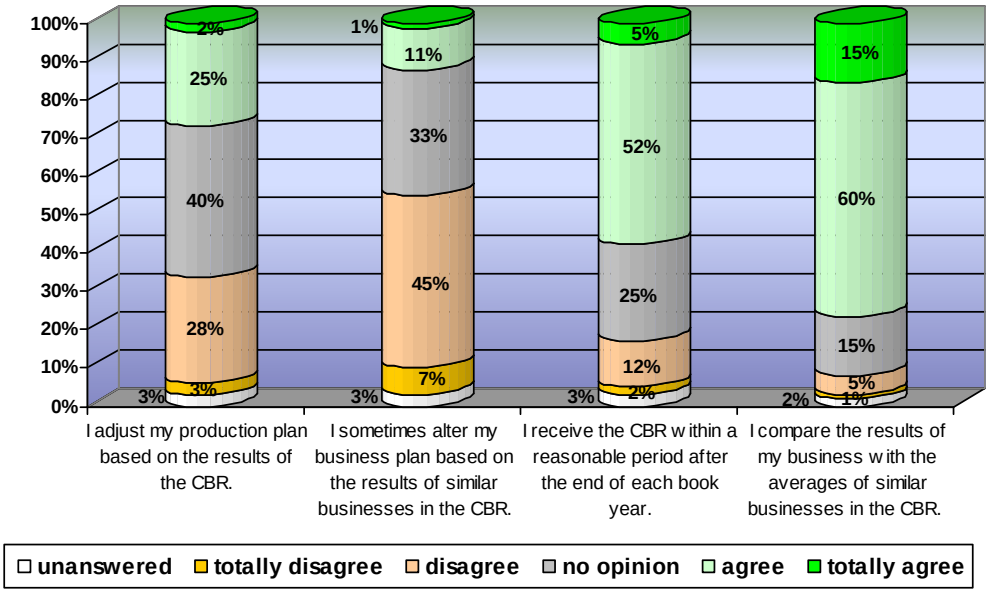
Most of the respondents (84%) are satisfied with the amount of information available in their IBR, 5% disagree. When asked if the FL-FADN participants find their business results in the IBR to be in line with their expectations, only 6% disagree. 84% of the respondents say that they are mainly interested in the financial results published in their IBR (4% disagrees).

A smaller group of 67% are mainly interested in the technical results (such as; yield per acre, litter size, et cetera) in their IBR.

Apparently 13% are not content with the period it takes to receive their IBR at the end of each financial year. An earlier delivery of the IBR is therefore a specific action that should be taken to improve the contentment of the participants of the FL-FADN.

15.5.3 The Comparing Business Report or CBR

Figure 15.2 The Comparing Business Report



Apparently fewer farmers consider the CBR difficult to understand than the IBR. Only 11% find the CBR hard to understand. It should be mentioned though that not every farmer receives the CBR due to an insufficient amount of that specific holding activity in the FL-FADN population. The CBR has only recently been introduced and is therefore not yet known by all the Flemish FADN participants.

Nevertheless, three quarter of the respondents use the CBR to compare their results with the results of other holdings. 27% admit that they adjust their business management based on the results in the CBR and 31% disagree, while the majority (40%) withholds their opinion.

A small group (12%) of participants sometimes alters their production plan based on the results of other businesses in the CBR. This emphasises the importance of having accurate and representative FADN data. 53% do not alter their production plan based on the results in the CBR.

The period within which the farmers receive their CBR at the end of a financial year is to long for 15% of the respondents, 64% disagree with this statement.

15.6 Interaction with the Flemish FADN accountant

In the field the accountant represents the entire FADN and it is therefore of crucial importance that the relationship between the farmer and his accountant is more than satisfactory. The questions in the survey about the interaction between the farmer and his FADN accountant try to give us an insight into this aspect.

When confronted with a problem concerning his FADN accounting, less than 1% of the Flemish FADN participants believe they cannot count on their accountant to help them with the matter. In other words 92% can always count on their FADN accountant when confronted with an FADN related problem.

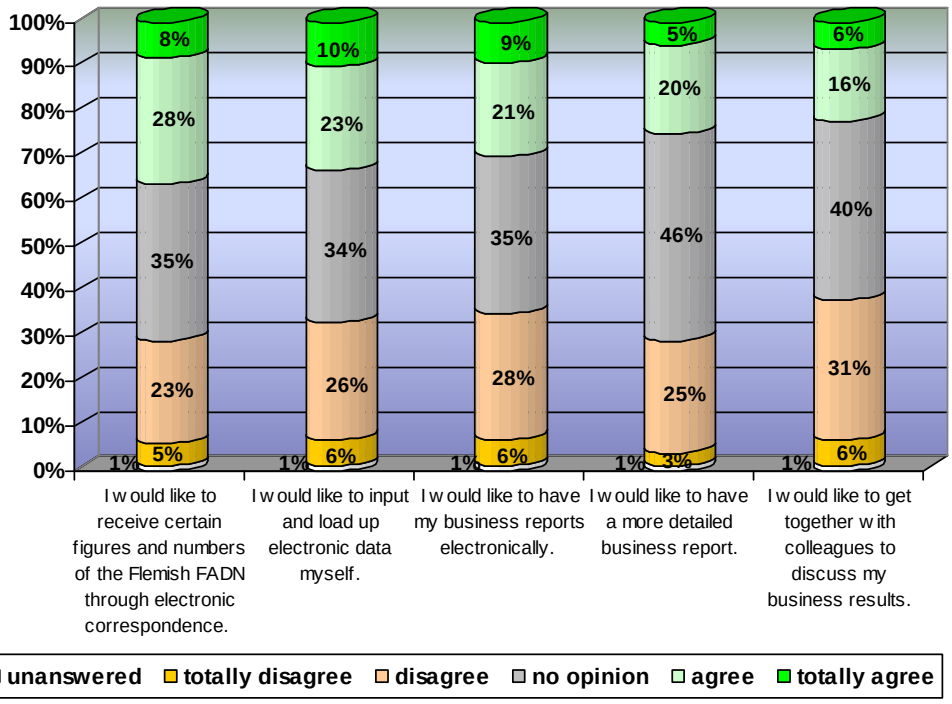
93% believe they can communicate openly about anything with their FADN accountant and 2% do not. More than four fifths (83%) of the farmers find their FADN accountant is well informed about the current situation of their sector.

91% say that when there is problem concerning the FADN accounting it is resolved as soon as possible (1% disagree). Less than 2% of the respondents are not satisfied with the communication or knowledge of their FADN accountant but more than 90% are.

A little more than 11% of the farmers would like to see their accountant dedicate more time to review and discuss their business reports with them. This remark was selected as a second action point that could be taken to improve the Flemish FADN. Finally 4% would like to see their accountant more regularly. In contrast, 85% think the current number of visits suffices.

15.7 Future opportunities

Figure 15.3 Future opportunities



This survey was also the ideal opportunity to investigate the possibility and willingness of farmers to do some data entry themselves. In general the results show that a small majority (± 40%) do not yet have an opinion on the presented statements. The rest of the survey population counted about 30% FADN participants who were interested and about 30% who were opposed. This means that when implementing the suggested proposals it would be necessary to convince some 40% of undecided farmers.

Results showed that 37% of the respondents are interested in receiving certain figures and numbers of the FL-FADN electronically. More that 33% would be willing to input FADN data electronically themselves (32% are opposed). This comes down to 189 of the FL-FADN farmers that are interested. For this reason the FL-FADN did a follow-up survey on the interests of electronic data input by FADN farmers in June 2010. The goal was to define which specific data and under which conditions FADN farmers would be interested in joining a project on direct electronic data input.

Furthermore about 30% are interested in having an electronic version of their business reports and 25% are interested in a more detailed version of their business report.

A minority of FADN participants (22%) is interested in getting together with their colleagues to discuss the business results published in their FL-FADN reports. So the participants are definitely more interested to compare their results anonymously in the CBR than to do so in a face-to-face meeting with other participants of the FL-FADN.

15.8 Most valued benefits of being an FADN participant

For future FADN recruitment it is interesting to know which of the services that you offer, are most appreciated by your participants. The last section of the survey asked the FADN participants to rank four statements, each grouped in a cluster, according to their importance.

15.8.1 Cluster 1

Cluster 1	The helpfulness of the Flemish FADN	The professionalism of the Flemish FADN	The fulfilment of engagements of the Flemish FADN	A clear communication towards the farmers by the Flemish FADN
unanswered	16%	16%	16%	16%
most important	19%	32%	13%	20%
important	23%	22%	22%	17%
less important	22%	19%	26%	17%
least important	20%	11%	23%	30%

The results of the first cluster showed that the professionalism of the FL-FADN was valued as being the most important FL-FADN service. In second place came the helpfulness of the FL-FADN. Third place was reserved for 'the fulfilment of engagements by the Flemish FADN'. Finally a clear communication towards the farmers by the FL-FADN was ranked as least important of the four statements by 30% of the FL-FADN participants.

15.8.2 Cluster 2

Cluster 2	Being able to compare my results with those of similar businesses	Having an estimate of my income	Having an accounting	Having an accounting free of charge
unanswered	14%	14%	14%	14%
most important	16%	35%	19%	17%
important	17%	24%	33%	13%
less important	26%	17%	23%	19%
least important	27%	11%	11%	38%

The second group of statements revealed that having an estimate of their yearly income is valued by 35% of the respondents as the most important of the four statements. This is a very comforting result as it is one of the main goals of the FL-FADN to provide farmers with an estimate of their income. Having an accounting is valued 'important' by a majority of respondents.

In third place we find the appreciation for the CBR which compares the farmers' personal results with those of similar holdings. Having an accounting that is free of charge is seen as least important when compared to the other three statements in the group.

15.8.3 Cluster 3

Cluster 3	Having an annual report as result of a calculated bookkeeping	Having an accounting that is free of charge	Having a bookkeeping that complies with the regulations of the Flemish agricultural investment fund	Reviewing my business results with my FADN accountant
unanswered	14%	14%	14%	14%
most important	28%	11%	30%	17%
important	24%	15%	22%	26%
less important	17%	22%	22%	25%
least important	17%	38%	12%	19%

As could be predicted, having an accounting that complies with the regulations to receive investment support is valued as most important in this cluster, this because 84% of the respondents is obligated to keep an accounting complying with the regulations of the Flemish Agricultural Investment Fund (VLIF).

Having an annual report as result of a calculated bookkeeping and reviewing those results together with an FADN accountant are valued as 'important' and 'less important' without a real significant difference between the two.

Having an accounting that is free of charge on the other hand is, just like in cluster two, seen as the least important statement.

15.9 Conclusions

Overall we can conclude that the FL-FADN participants are pleased with the cooperation with the FADN. The individual and comparing reports published by the Flemish FADN are definitely used to optimise their holdings' performance which is an important factor in convincing farmers to join up.

The guidance of their FADN accountant is considered a valuable benefit. The FL-FADN was particularly pleased to see that even though the CBR has only been distributed twice since its development in 2007, it can already count on much interest.

The results of the survey revealed two action points for the FL-FADN. First of all, the FL-FADN will try to deliver the reports sooner to the FADN farmers. Secondly, its accountants will try to dedicate more time to review the results published in the business reports in the coming years.

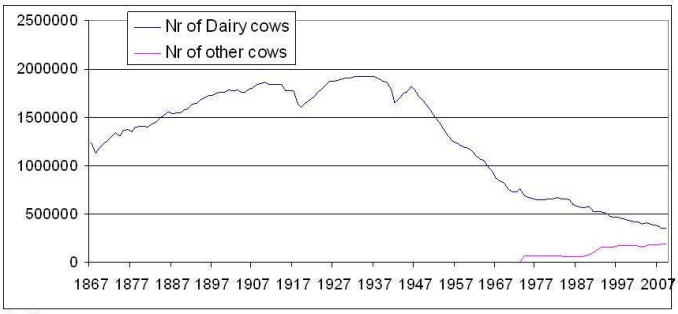
As the results concerning electronic data exchange showed a considerable interest of the participants a further inquiry was performed by the FL-FADN in June 2010. This was done in order to find out which effort the FADN farmers are willing to make and to get a rough idea of the number of interested participants. The results of this last inquiry will determine whether the FL-FADN starts up the project for direct electronic data exchange with its participants.

16 Profitability in cattle production

Ann-Marie Karlsson, Swedish Board of Agriculture

Jordbruks verket

Profitability in cattle production



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2010-09-30

Jordbruks verket

Profitability in cattle production

Problem

Is there a future for professional cattle production in Sweden?

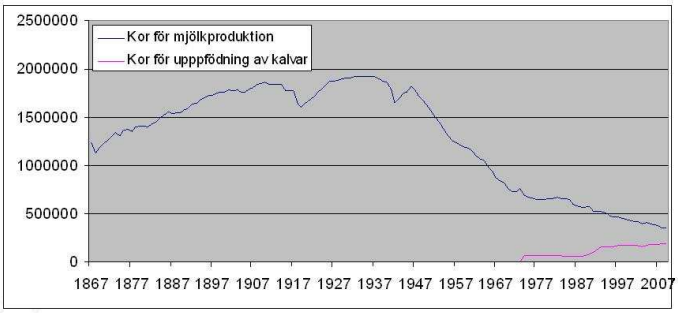
- 40 percent of cattle producers are older former dairyproducers
- Many farmers raise cattle as a hobby
- To few analyses where farms with and without cows have been analysed

Why is this interesting?

- Cattle holders association
- Political goals about diversity, area of grazingland requires grazing animals
- An grazing animals, grazing land gives value to tourism etc.

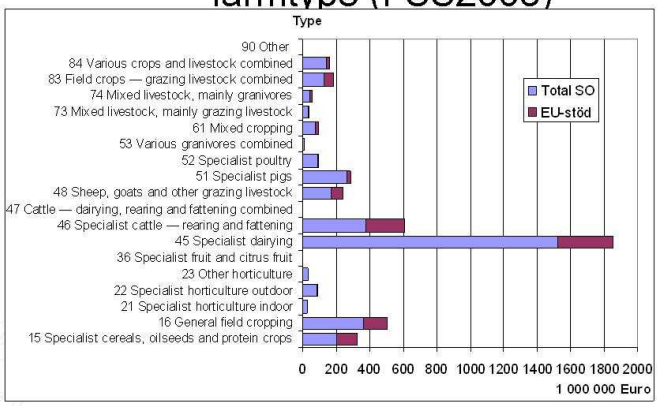
2010-09-30

Number of cows for dairy and meat



2010-09-30

Total SO and EU-subsidies per farmtype (FSS2005)



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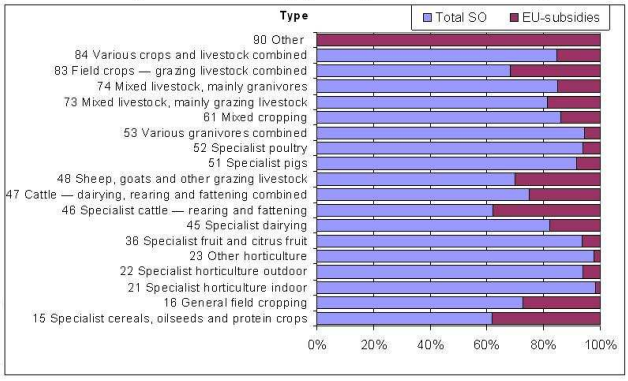
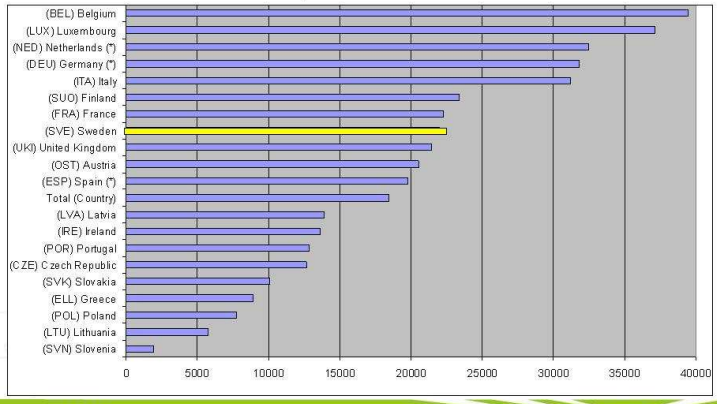
Share of SO and EU-subsidies per farmtype (FSS 2005)



2010-09-30

Farm net value added/AWU
Specialist cattle



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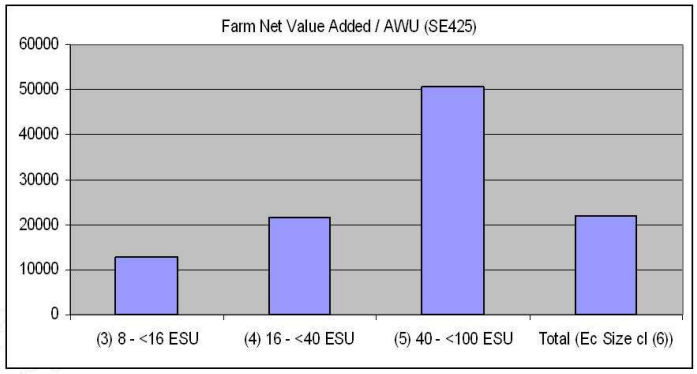
Farm net value added/AWU



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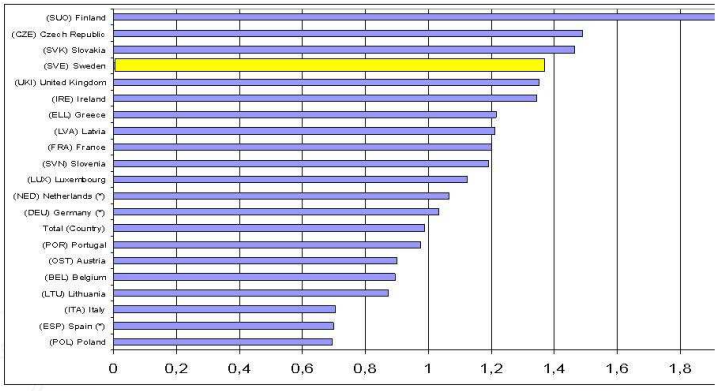
Total input/Total Output



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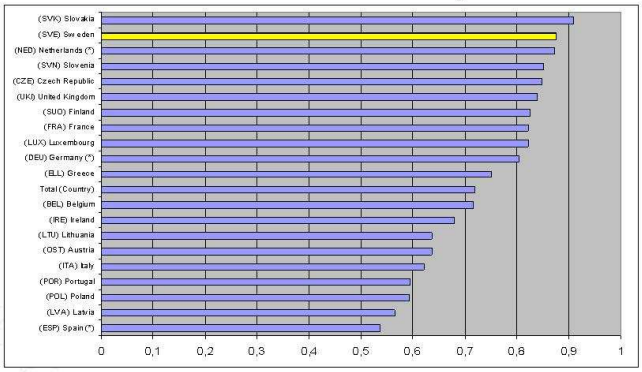
Total input/(Total Output+Total subsidies)



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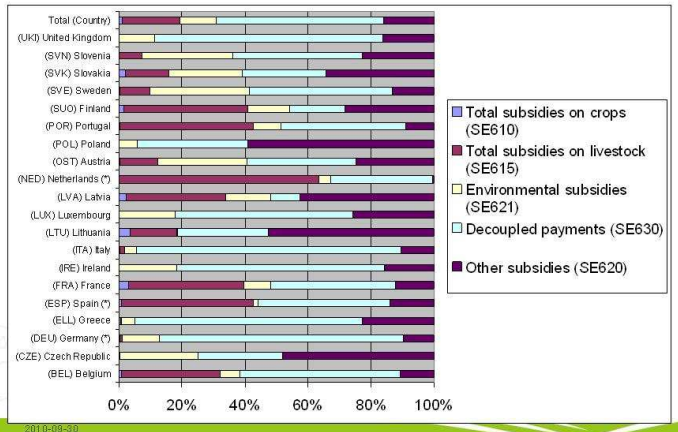
Share of subsidies



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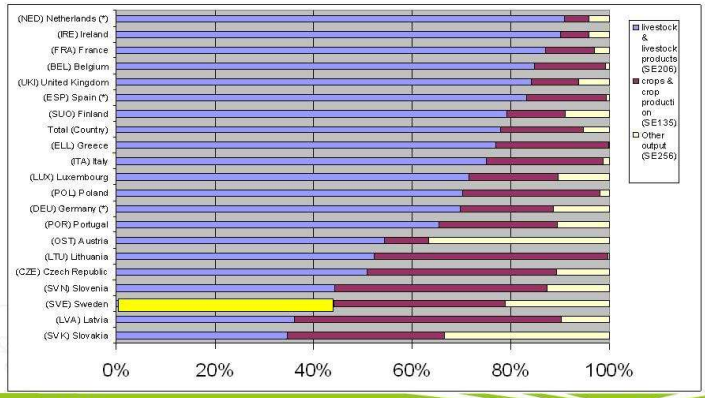
Share of output from crops, livestock and other



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Comparison cows no cows

	All	No cows	cows
Nr of holdings	3 069	525	2 544
Nr of holdings in sample	126	24	102
Crop production	55 673	75 958	51 145
Animal production	226 879	266 549	218 024
Direct Payment	329 896	440 027	305 312
Other Output	195 629	168 826	201 612
Output	**808 077**	**951 359**	**776 093**
Vegetable costs	57 358	51 788	58 602
Animal costs	96 868	143 299	86 504
Labour costs	18 919	45 690	12 944
Maintanence costs	68 963	71 550	68 386
Other costs	214 596	214 450	214 628
Summary Direct costs	**456 705**	**526 777**	**441 063**
Gross output	351 373	424 582	335 030
Depreciations	138 876	164 096	133 246
Rent	18 652	27 377	16 705
Interest	35 447	54 707	31 148
Summary other costs	**192 975**	**246 180**	**181 098**
Net value added	**158 398**	**178 402**	**153 932**
Investments	144 096	114 789	150 638
Net value added/AWU	**133 107**	**160 723**	**127 164**

2010-09-30

Compare with the frontier

Decoupling makes people carry on; more like a hobby; since subsidies nit dependent on result

Pherhqps econoic indicators are not the best: Have other goals Social indicators

intervies why farming

Age interesting

invest,mnets to look into different kinds of investment

Farms with difference in cows: Act in different way, or qgegoup, type of investment

2010-09-30

17 Economic and technical performance of Macedonian agriculture using FADN-type data

Martinovska-Stojcheska, A[1], L. Sergo[2], Y. Surry[3], V. Ilievska[4], H. Andersson[3] and D. Dimitrievski[1]

The content of this paper is solely the responsibility of the authors and does not necessarily represent the official views of the institutions they represent.

17.1 Abstract

The objective of this paper is to provide an overview, analysis and discussion of the situation and performance of Macedonian farms. As a candidate country to the EU, Macedonia is obliged to put in place a functional, compatible and harmonised farm accountancy data system, in line with the EU Farm Accountancy Data Network. The Farm Monitoring System (FMS), an annual survey conducted in line with FADN methodology, is used as the primary source of data. Farm returns are preliminary in the sense that they are calculated up to the gross farm margin level, and analysed for six regions within the country. Furthermore, the analysis takes into account the economic size of the farms and the type of farming.

17.2 Introduction

The objective of this paper is to provide an overview, analysis and discussion of the situation and performance of the farms in Macedonia[5] by using data from the Farm Monitoring System (FMS) - the national service that provides FADN type data. Panel data for agricultural holdings are an important source of information about the farm structure and income. Such data provide a basis for an analysis of the technical and economic farm performance over a certain period of time.

The major source of information regarding the agricultural sector in Macedonia is the State Statistical Office, which publishes annual yearbooks containing mostly physical data (land use, livestock numbers, yields and prices). The Economic Accounts in Agriculture, compiled since year 1998 in accordance with the EUROSTAT methodology, give insights of the value produced by the agricultural sector. Still, in order to get relevant information on the income and farm returns of agricultural holdings, microeconomic data are required from networks such as the EU FADN. In the European Union, FADN data are used for different types of analysis as well as monitoring the implementation and evaluating the impact of policy measures.

The results from this paper should be interpreted with caution, having in mind few limitations. First, this analysis only concerns privately-owned individual farms (defined as family agricultural holdings by the Law on Agriculture and Rural Development, 2007) and excludes data from agricultural companies and cooperatives. Family farms own or lease around 80% of agricultural land, whereas agricultural companies lease the remaining 20% that are in the ownership of the state (Ag Census, 2007). However, 46% of the value of purchased agricultural products in 2008 belongs to agricultural companies (SSO, 2009). Notably, in most of CEEC[6] countries that joined the EU in 2004, for instance Slovenia, the production potential of family

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[4] National Extension Agency, Bitola
[5] Macedonia's constitutional name is the Republic of Macedonia and this country is being provisionally referred within the United Nations system as 'the former Yugoslav Republic of Macedonia - FYROM' (UNSC Resolution 817/1993)
[6] CEEC stands for Central and Central and East European Countries.

farms in the pre-accession period was low, in particular due to the limited land and capital resources (Erjavec et al., 2003). In addition, subsistence farming was largely practiced, which is to a large extent corresponding to the Macedonian situation. In this respect, the National Extension Agency (NEA) will include data from agricultural companies and cooperatives from 2010 onwards.

Second, the quality of data collected during the FMS survey was subjected to a detailed check. The original data were scrutinised and filtered following the principles of homogeneity, continuity and coherence. The deviations from the observations' mean were taken into account. Last but not least, an expert check was conducted, examining the plausibility of data, especially in terms of yields and prices. Costs were checked for each cost item and as aggregated on an enterprise level. Data were corrected or interpolated when required.

Third, complete FMS data were available from 2005 onwards. Fourth, the farm fixed costs were not complete for all farms within the FMS data set and were therefore excluded; hence, the farm returns can be calculated up to the gross farm margin level. However, it is important to stress that these farms use dominantly family labour[1] and use almost no external sources of financing. Moreover, a significant portion of farms generates off-farm income to supplement the household. A previous study showed that smaller farms are more dependent on supplementary sources of income and most likely practicing farming as part-time activity, while larger farms are more commercial-oriented (Martinovska Stojčeska et al., 2008).

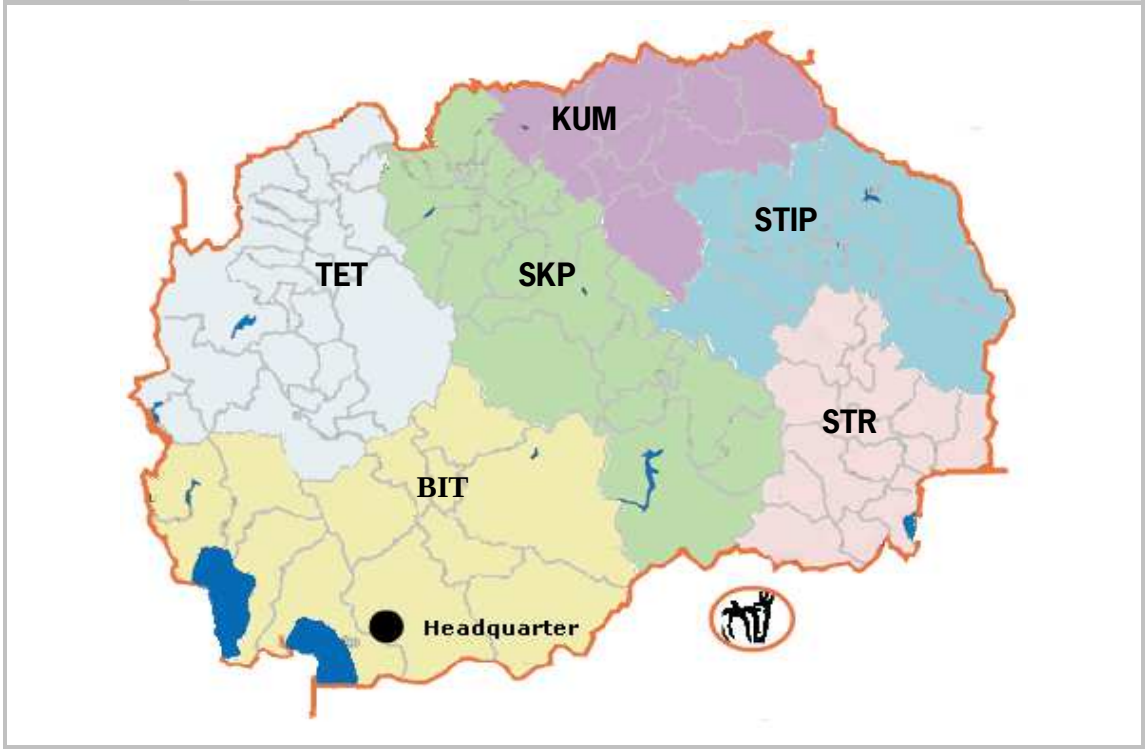
The data were processed in line with the EU-FADN methodology, and analysed for six regions within the country, as well as per economic size of the farms and type of farming. Technical and financial results will be presented, with conclusions in the end.

17.3 Methodology

The Farm Monitoring System, an annual survey conducted in line with FADN methodology, is used as the primary source of data. The first FMS survey was conducted in 2001, followed by the Farm Business Data report (Kamphuis and Dimitrov, 2002). The findings from that report are used as a basis for comparison with the preliminary processed FMS data from 2005 to 2009. Similar format was adopted for this paper in order to ensure comparability.

[1] The only exception is sheep farms.

Figure 17.1 **Regions as determined by NEA**



The *regional analysis* provides a perspective of the farms' economical and technical performances. NEA has determined six regions within the country according to the agricultural and climatic conditions. Hence, Bitola region (BIT) is in the South-West of the country, comprising the lakes of Ohrid and Prespa and also the Pelagonia plain; Kumanovo region (KUM) is in the North of the country; Skopje region (SKP) is the central region of the country stretching along the Vardar river basin; Stip region (STIP) is in the Eastern part of the country with semi-arid climate and the Ovce Pole plain; Strumica region (STR) is in the South-East of the country, with fertile soils; and Tetovo region (TET) is in the North-West of the country that is highly mountainous, comprising the fertile Polog plain.

The FADN methodology was applied for developing the farm typology, studying economic (farm) size and calculating the gross margin. The *economic size of the farms* is calculated in accordance to the FADN methodology (RI/CC 1256, 2008). Taking into considerations the relatively small size of Macedonian farms, whereas the average size of the individual farm ranged from 1.7-2.8 ha (State Statistical Office Census, 1994) to as low as 1.37 ha (State Statistical Office, Ag. Census, 2007), the farms in this study are grouped into six farm size groups, as shown in Table 17.1.

The *type of farming (TF)* is the other classification criterion, defined as the production system of a holding which is characterised by the relative contribution of different enterprises to the holding's total gross margin (GM). The general type of farming level is applied and adjusted in this study, as presented in Table 17.2.

Table 17.1	Classification of farms by size, adopted by FADN a)	
Farm size (FS)	**ESU class**	**Farm size 6 groups**
Very small farm	<2 ESU	VSF1
	2-<4 ESU	VSF2
Small farm	4-<8 ESU	SF
Medium-low farm	8-<12 ESU	MLF1
	12-<16 ESU	MLF2
Medium-high farm	>16 ESU	MHF

a) ESU=European Size Unite, equivalent to gross margin of €1,200 (FADN).

Table 17.2	Classification of farms by type, adopted by FADN
Type of farming (TF)	Methodology
Mixed farm	total livestock gross margin and total crops gross margin are less than 2/3 of the total farm gross margin
Fodder crops	total fodder gross margin is greater than 2/3 of the total farm gross margin
Fruit	total fruit gross margin is greater than 2/3 of the total farm gross margin
Vegetables	total vegetables gross margin is greater than 2/3 of the total farm gross margin
Industrial	total industrial crops gross margin is greater than 2/3 of the total farm gross margin
Mixed crop	total crops gross margin is greater than 2/3 of the total farm gross margin
Mixed livestock	total livestock gross margin is greater than 2/3 of the total farm gross margin
Cereals	total fodder gross margin is greater than 2/3 of the total farm gross margin
Grapes	total grape gross margin is greater than 2/3 of the total farm gross margin
Goats	total goats gross margin is greater than 2/3 of the total farm gross margin
Bees	total bees gross margin is greater than 2/3 of the total farm gross margin
Sheep	total sheep gross margin is greater than 2/3 of the total farm gross margin
Pigs	total pigs gross margin is greater than 2/3 of the total farm gross margin
Cattle	total cattle gross margin is greater than 2/3 of the total farm gross margin

The data derived from the survey were processed using a model for farm business data analysis, specifically developed for this purpose in *MS Excel*. The data were originally gathered in two databases: (i) database for incomes and (ii) database for costs, with an associated codebook containing the codes of farms, regions, advisors, type of crop or livestock and costs items. Additionally, another database containing the farm gross margins was developed, and supplementary codes of farm size and typology were added. The result tables were derived with a pivot table support. The gross margin of farms has been calculated as the difference of the total value of output and the total specific costs.

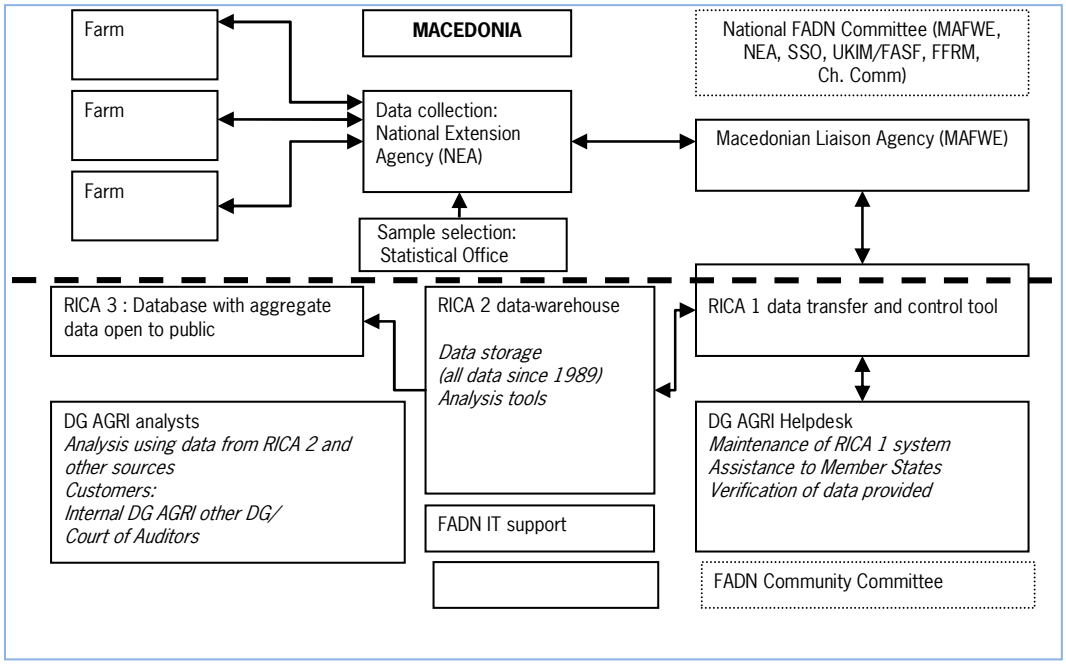
The prices used are taken as nominal, with conversion rate of 61.2 Macedonian denars to one Euro.

17.4 The Farm Accountancy Data Network (FADN) in Macedonia

The first attempt to create a set of data concerning income and costs of agricultural holdings in the Republic of Macedonia was channelled through the Ministry of Agriculture, Forestry and Water Economy (MAFWE), under the umbrella of the World Bank Private Farmers Support Project. In this framework, the Farm Monitoring System (FMS) was established at the National Extension Agency (NEA) in 2001.

The adoption of the Law on establishing a network for collection of accounting data from farms in 2007 provided a legal foundation for a formal set up of a farm accountancy data network in Macedonia. The Law defines the objectives of this network to be intended for determination of the farms' annual income and economic analysis of the farms, as well as evaluation of the conditions in the agriculture and the markets of agricultural products (Off. Gaz., 2007).

Figure 17.2 **The farm accountancy data flow in Macedonia**



Source: Doluschitz et al. (2008).

The network is comprised of the following entities and institutions: the Ministry of Agriculture, Forestry And Water Economy (MAFWE); the National Committee for network for accounting data from farms; the Farm Accountancy Data Unit within MAFWE, as Liaison Agency; the State Statistical Office; the National Extension Agency, collecting the accounting data at farm level; and the agricultural holdings (farms). Once gathered and checked at national level, the data are to be forwarded to the RICA data-warehouse (Figure 17.2).

The *Farm Monitoring System (FMS)* is a survey conducted by the National Extension Agency of the Republic of Macedonia. NEA advisors carry out the data collection and data entry of around 300 family farms every year throughout the country. The FMS data collection network is organised through six regional and around 30 local NEA units. Approximately 60 advisors are engaged in the process.

Data are collected directly from the farmers, using standard forms in line with the EU-FADN Farm Return questionnaire. The advisors usually visit the farmer several times per year in order to gather all necessary data. The data are then entered into specifically designed software. The FMS system not only provides aggregated data per household, but also includes detailed income and cost data per each farm enterprise, which enables calculation of analytical crop and livestock enterprise budgets (NEA, 2007).

The original selection of farms to be included in the FMS survey was based on a provisional farm typology, following the Standard Gross Margin (SGM) approach as defined by FADN (RI/CC 882, 2008) and therefore not statistically representative, which can thus be regarded as an approximation (Kamphuis and Dimitrov, 2002). The reasons behind this provisional approach are due to the fact that the annual Statistical Office survey is not representative; the SGM were calculated based on available reports and expert calculations; and the selection was restricted to farmers who already had contacts with NEA (ibid). The Agricultural Census carried out in 2007 provided grounds for determination of a representative sample for all agricultural holdings within the country, to be used from year 2010.

The number of farms included in the FMS survey is also given in this section, along with regional typology and farm size structure (see Table 17.3). In the first year of the survey (2001), 417 farms were included. The number of farms has steadily decreased in the following years, mainly due to financial difficulties to meet the costs of the survey. However, since 2009 the situation has stabilised and the number of farms increased to the original level.

In a regional context, during the period 2005 to 2009 most farms included in the survey were from the Skopje and Bitola regions, with about a quarter of the total number each. Strumica farms represent 18%, Tetovo farms 14%, Kumanovo 11% and Stip 9% of the total sample.

The regional structure of the FMS survey in terms of number of individual agricultural holdings is generally reflecting the structure recorded at the latest Agricultural Census (2007), as shown in Table 17.3.

Table 17.3 Number of farms in the FMS survey per region

Region	2005	2006	2007	2008	2009	All years	Structure	SSO*
BIT	71	67	44	48	110	340	23%	20%
KUM	61	30	26	23	25	165	11%	11%
SKP	73	66	63	69	94	365	25%	22%
STIP	27	15	16	13	59	130	9%	14%
STR	47	36	57	61	69	270	18%	14%
TET	43	32	34	30	62	201	14%	18%
All regions	322	246	240	244	419	1471	100%	100%

Source: SSO, Agricultural Census (2007), Book III.

17.5 Farm structure of Macedonian farms

The farm structure of the FMS sample with regard to typology is illustrated in the following figures. In the 2001 sample, more than half of the farms are classified as mixed; in 2005 the share of farms with mixed crop and livestock production falls to 30%, and then it increases to 53% in 2009. Mixed farms are, without any doubt, an important segment of Macedonian agriculture, given that farms are small and usually choose a diverse production structure with a wide range of products.

Figure 17.3 Number of farms per farm type

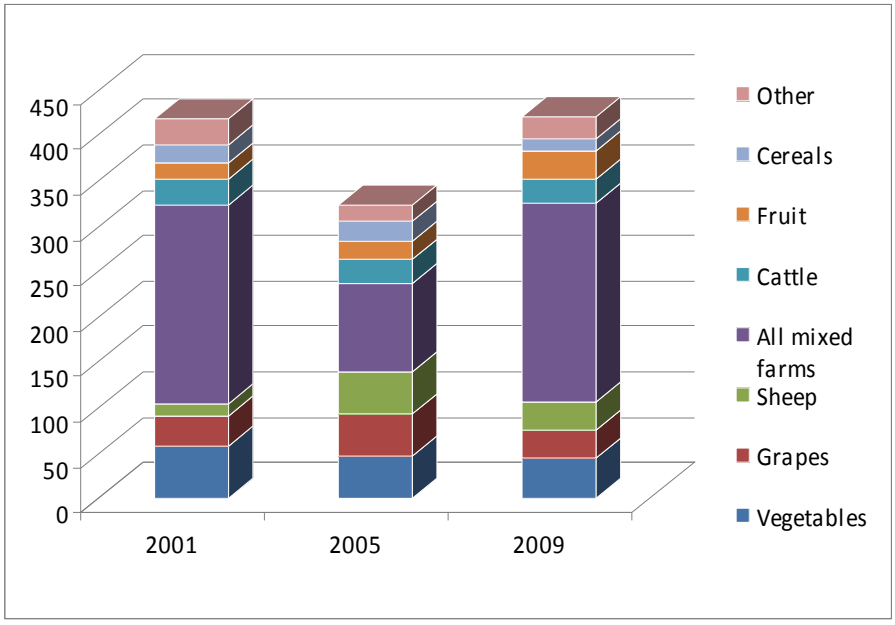
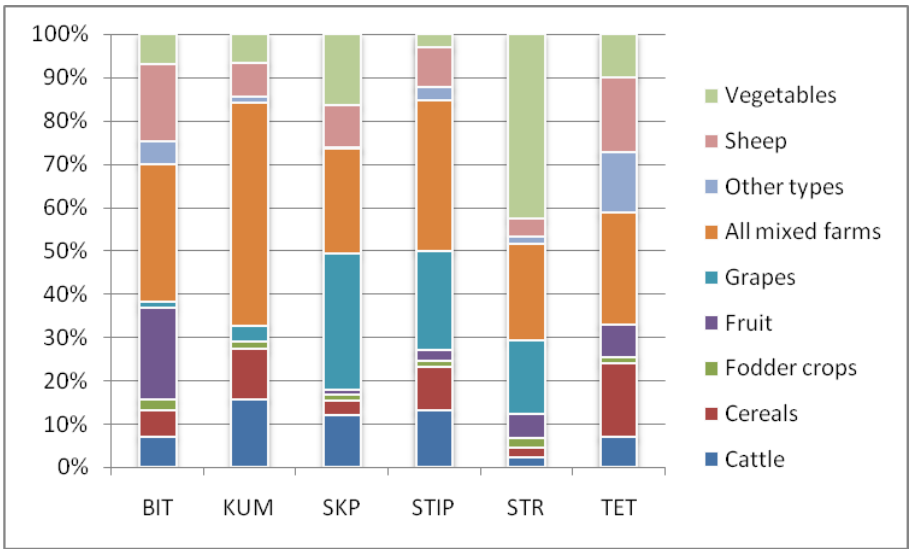


Figure 17.4 **Structure of farms, per region and type**



Vegetable farms are represented with a relatively stable share, ranging from 11% in 2009 to 15% in 2005; grape farms are present with around 7-8% in years 2001 and 2009 and with 14% in 2005, respectively. Cattle farms have a steady share from 6-8% throughout the years.

Analysed per region for the period 2005-2009, one-third of the farms in Bitola are regarded as mixed farms (including mixed crop and livestock farms); around 20% each share belongs to fruit farms (mostly apple farms in the Resen area) and sheep farm (typical for this region). In Kumanovo half of the farms are mixed, followed by cattle, cereals and sheep farms. One-third of the Skopje farms are producing grapes as their main crop, since the Vardar basin river being the most important grape area belongs to this region. Mixed farms take the second place, followed by vegetable farms, cattle farms and sheep farms. Stip region is featured with mixed and grape farms. Strumica region is typical for vegetables. Tetovo region has a rather even structure of mixed farms, combined with cereals in the Polog plain and sheep farms in the highlands.

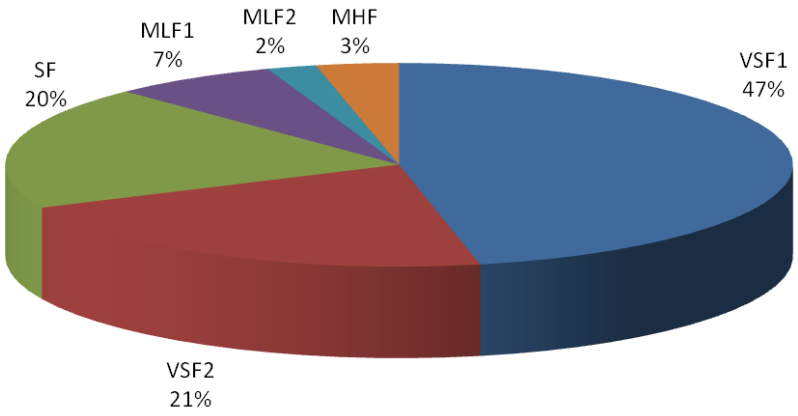
Most of the farms included in the FMS survey 2005-2009[1] belong to the very small farms category of economic size, reflecting the structure of family farms in Macedonia (see Table 17.4 and Figure 17.5). The largest share of farms are those with farm gross margin of less than 2 ESU (VSF1), followed by farms with farm gross margin from 2 to 4 ES (VS2). Small farms with farm gross margin between 4 to 8 ESU comprise 20% of the surveyed farms. Medium-sized farms account for 12% of the total sample.

Table 17.4 **Structure of farms by economic farm size (number of farms)**

Region	All years	Share
VSF1	687	47%
VSF2	314	21%
SF	290	20%
MLF1	100	7%
MLF2	30	2%
MHF	50	3%

[1] No data are available for 2001 FMS survey in this respect.

Figure 17.5 **Number of farms per economic farm size**



The development of the farm size in terms of number of hectares of cultivated land remained stable throughout the years and no significant changes occur. The majority of the farms cultivate less than 2 ha of land (48-52%), followed by farms that cultivate 2 to 5 ha (32-35%). Based on these statistics, less than 20% of the farms cultivate more than 5 ha of land (Table 17.5).

The average number of hectares per FMS farm is around 3-3.5 ha (Table 17.6). The highest portion of land cultivated on a farm is on mixed farm, mixed crop and cereal farms. Mixed farm cultivated land has increased in the past period by 44%, whereas the area under cereals has experienced a decrease by 42%.

The area under more profitable cash crops has experienced a positive trend. The average farm size of vegetable farms has grown from 2.39 ha in 2001 to 2.87 ha in 2005 and finally reached 3.39 ha in 2009. The area of grape farms has also increased from 1.31 ha/farm in 2001 to 1.77 ha/farm in 2009.

The livestock numbers on an average FMS farm, converted as into Livestock Unit coefficients (LU),[1] were 5.82 LU in 2001, then decreased to 4.56 LU in 2005 and increased significantly to 7.65 LU in 2009 (Table 17.7). During this period the cattle numbers follow the same trend within the sample; many farms purchased milking cows in the period from 2005-2008 as a result of the then growing number of dairies. Sheep numbers vary significantly; this situation is probably due to the selection of farms in the sample; an average farm would have 324 sheeps in 2009.

Table 17.5 **Structure of farms by farm size (ha of cultivable land)**

Farm size	2001		2005		2009	
<2 ha	200	48%	167	52%	203	48%
2-5 ha	146	35%	103	32%	134	32%
5-10 ha	45	11%	33	10%	54	13%
10-15 ha	26	6%	18	6%	28	7%
Fruit	417	100%	322	100%	419	100%

[1] The Livestock Unit coefficients (LU) are used for conversion of the average number of animals per category. For instance, one dairy cow is converted to 1 LU, one sheep to 0.1 LU et cetera (RI/CC 882, 2008).

Table 17.6	Size of farms by farm type (ha of cultivated land)					
TF	**2001**	**2005**	**2009**	**2005-2009**	**2005/2001**	**2009/2001**
Vegetables	2.39	2.87	3.39	2.71	1.20	1.42
Mixed crop	4.40	3.73	3.09	3.64	0.85	0.70
Grapes	1.31	1.69	1.77	1.81	1.29	1.35
Sheep	1.04	1.53	3.47	2.00	1.47	3.34
Mixed farm	4.05	5.07	5.83	4.40	1.25	1.44
Cattle	2.93	3.47	2.55	2.67	1.18	0.87
Fruit	2.10	3.13	2.46	2.49	1.49	1.17
Cereals	7.28	3.49	4.25	3.34	0.48	0.58
Other	2.60	3.07	2.93	2.51	1.18	1.13
Total farms	3.52	3.00	3.26	3.11	0.85	0.93

Table 17.7	Size of farms by farm type (livestock units - LU)				
TF	**2001**	**2005**	**2009**	**2005/2001**	**2009/2001**
Vegetables	0.27	0.25	0.27	0.92	1.00
Mixed crop	1.91	2.29	0.93	1.20	0.49
Grapes	0.00	0.00	0.00	/	/
Sheep	46.31	17.60	32.41	0.38	0.70
Mixed farm	7.70	5.73	11.48	0.74	1.49
Cattle	13.67	8.73	15.87	0.64	1.16
Fruit	0.20	0.00	0.04	0.00	0.20
Cereals	0.10	0.90	0.43	9.00	4.30
Other	18.22	4.58	18.56	0.25	1.02
Total farms	5.82	4.56	7.65	0.78	1.31

17.6 Gross margins and income of Macedonian farms

The gross margins of the most important crops in the country generally decrease over the years. Overall, this situation stems likely from increasing input prices, and decreasing producer prices. It is important to state that these gross margin results do not include the income from subsidies, which became an important component since 2004.

Table 17.8 provides an overview of the gross margin calculation for some major crops in 2001 (extracted from Kamphuis and Dimitrov, 2002); weighted averages from FMS in 2005 and 2009; as well as a recently calculated aggregation of Standard Output in 2009 (calculated by MAFWE for FADN sample determination).

The gross margins of cereals have declined substantially. The index 2009/2001 is particularly low for these crops, primarily due to the low producer prices in 2009. The gross margin of barley, for instance, is just one-fifth of the 2001 level; the five-year average (2005-09) is around 40% lower than the 2001 gross margin. The gross margins of fruits have also decreased in the past period. Apples have the highest gross margins in the Strumica and Bitola regions, ranging from 5 to 6.5 thousand Euros/ha in year 2007 and 2008. The gross margins of vegetables have dropped by at least half in the past period, except for cabbage where significant increase is noted. The inputs' and producer prices of these commodities also influenced this decline.

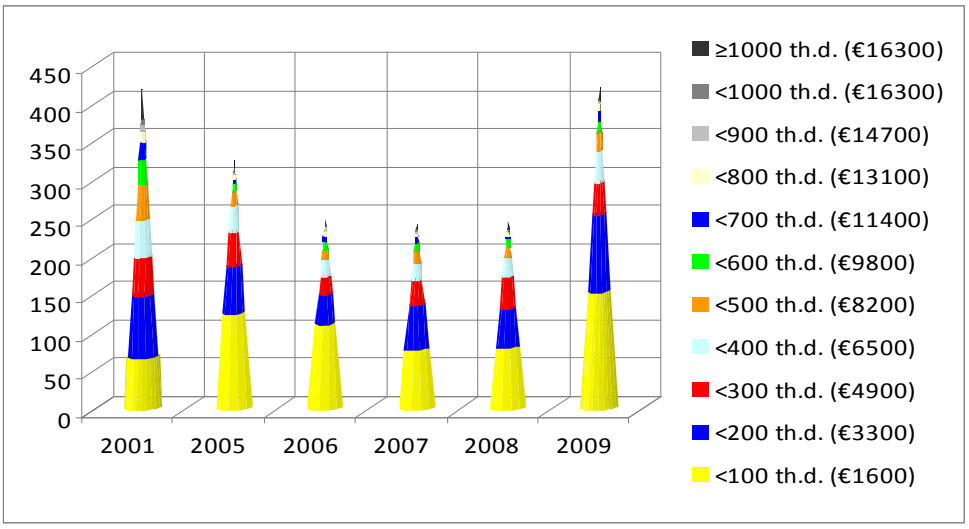
Table 17.8	Gross margin calculation for some major crops 2001, 2005 and 2009 and aggregation of Standard Output 2009 (in Euros/ha)						
Crops	**SGM 2001 b)**	**2005**	**2009**	**2005-09**	**2005/2001**	**2009/2001**	**SSO 2009 c)**
Barley	410	211	76	247	0.51	0.19	396
Maize	1,213	679	454	536	0.56	0.37	554
Tomatoes	14,674	4,795	7,424	6,952	0.33	0.51	34,197 a)
Peppers	7,411	3,468	4,380	4,239	0.47	0.59	5,555
Watermelons	4,123	696	2,491	1,114	0.17	0.60	5,555
Potatoes	3,640	1,923	3,029	2,167	0.53	0.83	2,646
Onion	4,544	3,025	4,274	1,961	0.67	0.94	5,555
Cabbage	2,787	3,843	4,666	4,585	1.38	1.67	5,555
Beans	2,163	3,061	1,131	2,180	1.41	0.52	1,421
Apples	4,805	1,853	2,201	3,277	0.39	0.46	3,366
Wine grape	2,459	1,807	1,086	1,278	0.73	0.44	3,316
Tobacco	3,258	3,203	3,501	2,730	0.98	1.07	2,536
Alfalfa	1,668	955	480	623	0.57	0.29	503
Wheat	327	243	100	237	0.74	0.31	544

a) An average SO for group of fresh vegetables, under protective cover: tomato GH, tomato PH, cucumber GH, cucumber PH, cabbage PH, pepper PH (MAFWE, 2010).
Sources: b) Kamphuis and Dimitrov (2002); c) MAFWE (2010).

The gross margin value of farms has changed significantly during the course of the years. In year 2001, only 16% of the farms had less than 100,000 denars (€1,630) of the total gross margin per farm (Figure 17.6). This percentage has increased to around 36% in the period 2005-2009, meaning that a significantly larger portion of the farms got lower farm gross margin value and relatively speaking the farm gross margin has decreased for a large number of Macedonian farms in the last decade. It is important to stress here that no minimum threshold was set for inclusion of farms in the FMS survey. In addition, holders of very small farms practice agriculture as part-time activity.

Farms with higher gross margins i.e. over 1 million denars (€16,300) had a 10% share in 2001, compared to the relatively low share of 5% in years 2005-2009.

Figure 17.6 Number of FMS farms in terms of GM per farm in thousand denars (th.d) and Euros



The average gross margins of farms, region-wise, have shown certain changes over the period 2001-2009. The highest farm gross margin of €5,613 is reached in the Bitola region, followed by farms in the Skopje and Strumica region (Table 17.9).

The farm gross margin per farm size groups, in terms of farm economic size, is understandably higher for larger farms, ranging from €595 for very small farms (with less than 2 ESU) to over €30,103 for medium-high size farms.

The total value of output on all farms is on average €9,238, being highest at sheep, mixed livestock and cattle farms. The specific costs per farm, with regard to its typology, are presented as an average sum of the period 2005 to 2009. Highest costs occur at sheep, industrial crops, cattle, vegetable and mixed farms, whereas grapes and pigs farms are characterised with lowest costs per farm (see table 17.10). Highest crop specific costs occur expectedly at vegetable and fruit farms, and highest livestock specific costs at sheep, cattle and mixed livestock farms.

The highest gross margin per farm is observed for industrial crops farms (usually growing tobacco), followed by sheep and goat farms, and mixed farms. Vegetable and fruit farms also produce a gross margin that is noteworthy. The lowest gross margin is met at cereals and fodder crops farms.

Table 17.9 Average GM per farm, per region and per economic size in 2005-09, in Euros

Region	2005-09	Farm size	2005-09
BIT	5,613	VSF1	595
KUM	3,868	VSF2	3,360
SKP	4,798	SF	6,487
STIP	3,432	MLF1	10,654
STR	4,010	MLF2	15,188
TET	2,575	MHF	30,103
All farms	4,313	All farms	4,313

Table 17.10 Per farm total specific costs, value of output and gross farm income 2005-09 (in Euros)

Category	Total value of output (SE131)	Crop specific costs (SE285-305)	Livestock specific costs (SE310-330)	Total specific costs (SE281)	Gross margin (SE131-SE281)
Cattle	10,265	514	6,547	7,061	3,204
Cereals	6,168	1,808	1,427	3,235	2,933
Fodder crops	6,472	1,544	3,336	4,879	1,593
Fruit	9,071	3,980	23	4,002	5,069
Goats	8,217	198	2,341	2,538	5,678
Grapes	4,053	1,541	4	1,544	2,508
Industrial	9,521	2,615	1,697	4,312	5,209
Mixed crop	6,568	1,839	1,212	3,050	3,517
Mixed farm	10,912	1,391	4,280	5,672	5,240
Mixed livestock	12,319	770	6,509	7,279	5,040
Pigs	2,852	258	1,309	1,567	1,285
Sheep	19,031	747	10,946	11,693	7,338
Vegetables	9,250	4,072	176	4,248	5,002
Grand Total	9,238	2,001	2,901	4,902	4,313

The agricultural holdings in the European Union are on average more than seven times the size of the agricultural holdings in Macedonia. The average economic size of EU farms in 2007 was 28.5 ESU, while the Macedonian match for the period 2005-09 was determined to be 3.8 ESU (a previous study on a sample of Macedonian farms determined it at 5.9 ESU in 2004; Martinovska-Stojčeska et al., 2008).

The average utilised agricultural area (UAA) per agricultural holding shows high variability among the 27 EU member countries; only the EU countries in South-East Europe are included in Table 17.11. In this respect, the average UAA/farm is the highest in Hungary with 54.1 ha, and the lowest in Greece with 7 ha in 2004. The average derived from the Macedonian sample farms is 3.1 ha UAA/farm, which is higher than the official statistical mean of 1.37 ha per farm (State Statistical Office, 2007), meaning that the farms included in the sample were slightly larger than the average. The livestock units per agricultural holding in the EU in 2007 in average reach 25.5, whereas the Macedonian average equals 6.3 LU/holding.

Macedonian farms reach lower wheat and maize yields per hectare than the EU average; according to the FMS data 2005-09, the Macedonian average is 3.2 t/ha for wheat and 5 t/ha for maize; compared to the EU average of 5.2 t/ha for wheat and 7.4 t/ha for maize, respectively. However, Macedonian farmers got higher wheat yields than farmers in the Bulgaria, Greece and Romania; and higher maize yields than farmers in the Bulgaria and Romania (Sergo, 2010).

Table 17.11 Comparison of FMS results with EU countries in South-East Europe

	Economic size (ESU)	Utilised agricultural area UAA (ha)	Livestock units (LU)	Wheat yield kg/ha)	Maize yield (kg/ha)	Gross Margin	Gross Farm Margin per ha UAA
FADN code	**(SE005)**	**(SE025)**	**(SE080)**	**(SE110)**	**(SE125)**	**(SE131-281)**	**(SE131-281/025)**
Bulgaria 2007)	8.1	25.3	8.3	2,074	1,236	12,246	483
Greece (2007)	10.8	7.0	4.4	2,918	11,630	14,246	2,024
Hungary (2007)	22.9	54.1	20.9	3,625	4,057	37,967	702
Romania (2007)	3.0	10.2	5.0	2,180	2,952	6,467	636
Slovenia (2007)	8.7	11.6	12.1	4,358	8,695	12,075	1,044
EU-27 (2007)	28.5	30.6	24.5	5,198	7,352	39,770	1,300
Macedonia (2005-2009)	3.77	3.1	6.3	3,232	4,993	4,313	1,391

Source: FMS Survey 2005-2009 and own calculations based on the FADN public database.

The gross margin at Macedonian farm holdings is significantly lower as compared to some of the countries that joined the EU in 2004 (such as Hungary) and closer to the countries that have joined in 2007 (e.g. Romania). Although this analysis lacks data about depreciation and external factors costs, previous studies argue that the margin between the gross farm income (SE410) and the farm net value added (SE415) in Macedonian conditions is small (Martinovska-Stojčeska *et al*, 2008). Namely, land is mostly owned by the farmers; family labour is dominant and seasonal labour is only occasionally hired; and furthermore farmers are rarely using borrowed capital (only 1.46% of the total farms in the country prepared loan application business plan in the past decade, MAFWE, 2007).

Macedonian farms achieve the lowest average value of €4,313, whereas the calculated EU-27 average in 2007 was €39,770 per farm. Linking the farm income to the utilised area, as a land productivity notion, the country has high farm income per 1 ha, only surpassed by Greece.

17.7 Concluding remarks

Having a farm accountancy data system that provides farm income information is without any doubt an important tool for policy analysis and evaluation. In this respect, the Farm Monitoring System (FMS) of the National Extension Agency provides valuable data to determine the economic and technical performance of Macedonian farms. The FMS is now officially providing data for the Macedonian network for collection of accounting data from farms, as defined by Law in 2007. The objective of this network is determination of the farms' annual income, as well as evaluation of the conditions in the agricultural sector and the markets of agricultural products.

FMS data provide a significant outlook of the family farm structure. With regard to typology, mixed farms are an important segment of Macedonian agriculture, given that these farms are small and usually choose a diverse production structure with a wide range of products. Vegetable farms are represented with a relatively stable share, ranging from 11% in 2009 to 15% in 2005; grape farms are present with around 7-8% in years 2001 and 2009 and with 14% in 2005, respectively. Cattle farms have a steady share of 6-8% throughout the years.

Analysed per region, farms in Bitola are regarded as mixed farms, fruit (apple) farms and sheep farms. In Kumanovo the majority of the farms are mixed, with occurrence of specialised cattle farms, cereals farms and sheep farms. Skopje farms are producing grapes as their main crop, since the Vardar basin river being the most important grape area belongs to this region. The Stip region is very diversified featuring mixed farms, grape farms, followed by cattle farms, cereal farms and sheep farms. Strumica region is typical for vegetables. Tetovo region has rather even structure of mixed farms, followed by cereals in the Polog plain and sheep farms.

The average number of hectares per FMS farm is around 3-3.5 ha, higher than the statistical average of 1.37 ha (SSO, Ag. Census, 2007). Most of the farms included in the FMS survey 2005-2009 belong to the very small farms category of economic size. The largest share of farms are those with farm gross margin of less than 2 ESU (VSF1). This structure remained stable throughout the years and no significant changes occurred.

The gross margins of the most important crops in the country generally decrease over the years. Overall, this situation comes mainly as a result of the increasing input prices, and decreasing producer prices. It is important to state that these gross margin results do not comprise the income from subsidies, which became an important component since 2004.

The highest gross farm margin is noted at industrial crops farms (usually growing tobacco), followed by sheep and goat farms and mixed farms. Vegetable and fruit farms also produce a gross farm margin that is noteworthy. The lowest gross farm margin is met at cereals and fodder crops farms. The farm gross margin ranges from €595 at very small farms to over €30,103 at medium-high farms.

The agricultural holdings in the European Union are on average more than seven times the size of the agricultural holdings in Macedonia. Macedonian farms reach lower wheat and maize yields than the EU average. The gross farm margin at Macedonian holdings is significantly lower as compared to some of the countries that joined the EU in 2004 and closer to the countries that joined in 2007.

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18 Comparing economic performance indicators for agricultural holdings between member states

Interpreting differences and policy aspects

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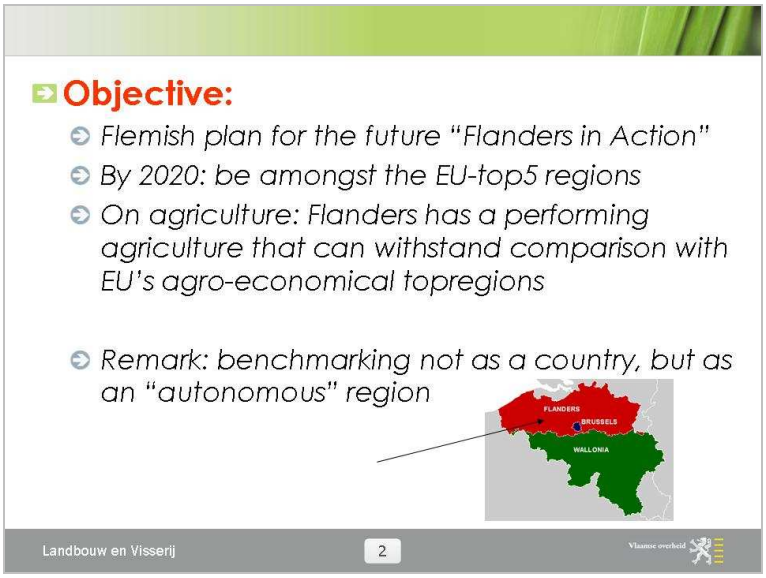


Approach:

- Use Farm Accountancy Data Network (FADN) as a basis (EU Farm Economics Review)
- Start with 2006 report: 15 years of information until 2020

Possibilities:

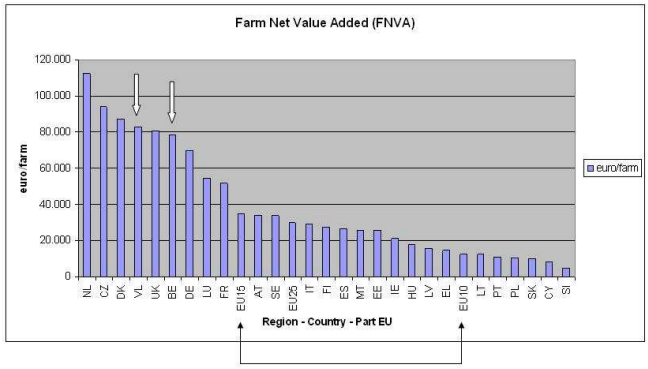
- EU-25 -- > EU-27 (+ Romenia and Bulgaria)
- old MS versus new MS
- Flanders versus Belgium
- Recalculate Flanders according tot FADN methodology (comparison of sectors)

Farm economic indicators:

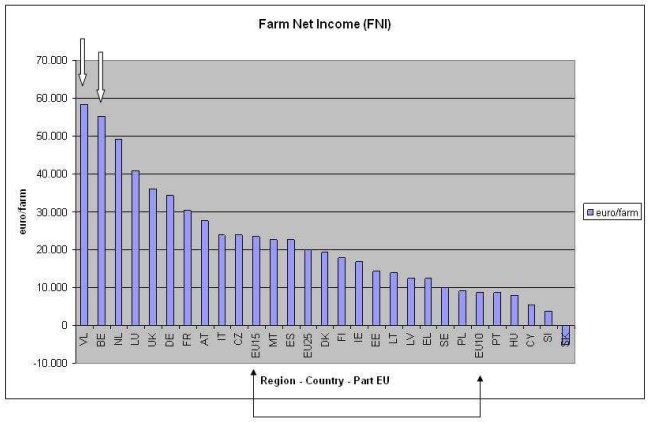
- Farm Net Value Added (FNVA)
- Farm Net Income (FNI)
- FNVA/Annual Working Unit (AWU)
- FNI/AWU
- Productivity (multi-factor productivity) (ratio)
- Solvency (own assets/total assets) (%)
- Liquidity (short term assets/short term liabilities) (ratio)
- Return on assets (FNVA/average assets) (%)

EU-benchmarking (2006)

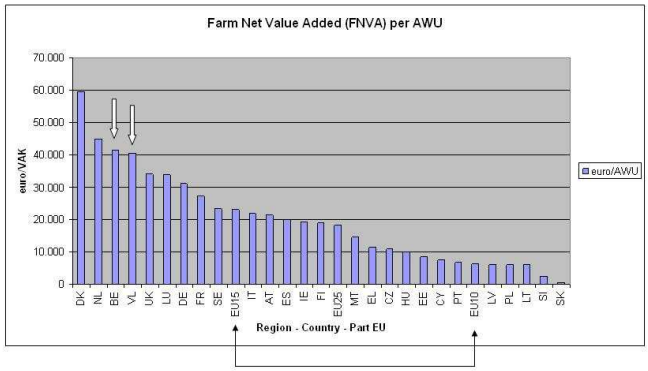
Farm Net Value Added (2006)



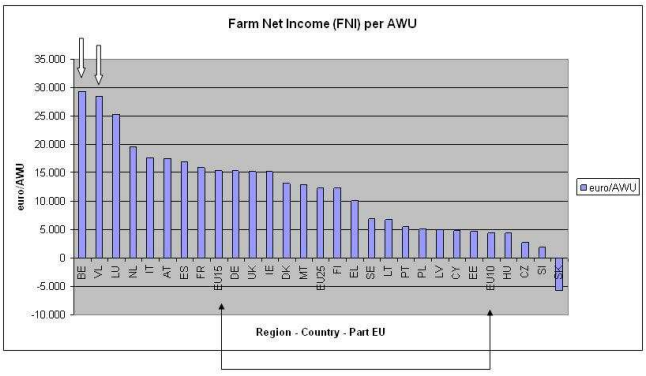
Farm Net Income (2006)



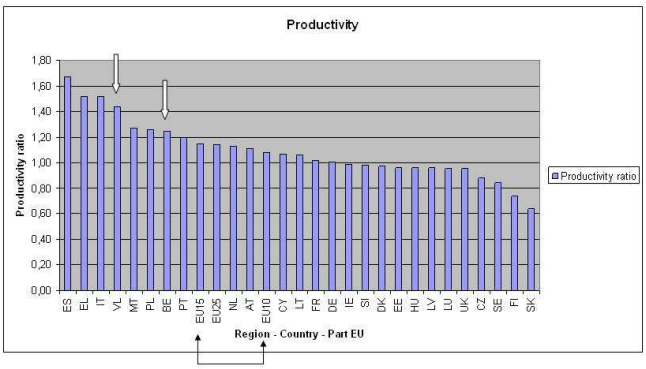
Farm Net Value Added per AWU (2006)



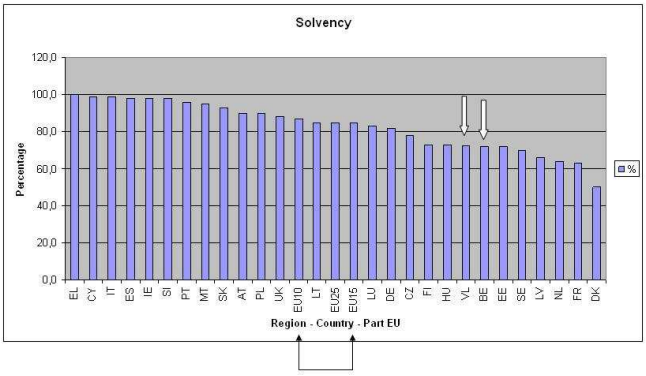
Farm Net Income per AWU (2006)



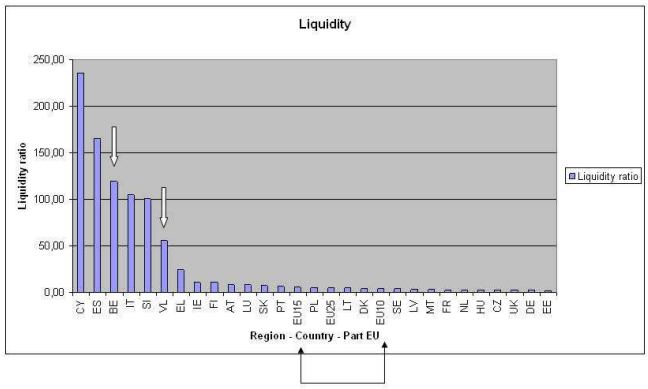
Productivity (2006)



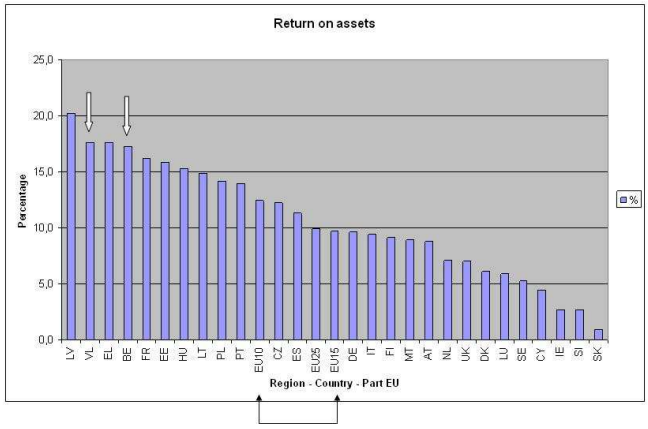
Solvency (2006)



Liquidity (2006)



Return on assets (2006)



Use:

- *Interpreting (data for) each indicator*
- *Interpreting indicators all together*
  - where are we as a region?
  - strenghts and weaknesses
- *Policy making (present)*
  - what can we do to improve?
- *Policy monitoring (from 2006 -- > 2020)*
  - are we moving in the right direction?

Problems - type 1

Expectations from policy makers (1)

- *Policy makers want explanations for differences between countries and regions*
  ... but these are not always that easy to give!
  - FNVA, FNI, FNVA/AWU en FNI/AWU -- > not too difficult
  - Often different story for other indicators
    - *1. Productivity: VL at good end of graph, but why between ES, EL, IT, MT and PL? How calculated (multi-factor)?*
    - *2. Liquidity: VL again at good end of graph, but why surrounded by IT, SI, EL and IE? Why is liquidity in Cyprus so high (and in southern Europe in general)?*
    - *3. Return on assets: VL second, but why between LV and EL?*
  - Only one solution -- > going back to the basic data?

Expectations from policy makers (2)

- *Data at country and region level hide possible huge differences between sectors and between farms within the same sector*
  - overall figures do not show these differences
  - possible compensations between sectors
- *Yearly fluctuations in general price levels and yields might disturb the picture*
- *Within the same year, climatic and other variations might not affect all EU-member states in the same way*
- *Even when changing the policy, the effect on overall farm performance is not immediate*

Problems - type 2

Timeliness of the data

- *Final version of EU Farm Economics Review 2006 available in January 2009*
  (appendix with performance indicators per MS)
- *Review 2007 still not available in July 2010!!!*
  - time lag (2007-2010) too long for policy making?
  - problem with regularity in reporting
- *Public database does not help*
  - Yes: FNVA, NFI, FNVA/AWU, NFI/AWU
  - No: productivity, solvency, liquidity, return on assets

Problems - type 3

- **Accuracy of the data**
  - *Search for data in the public database has revealed differences in figures between:*
    - EU Farm Economics Overview 2006
    - Public database 2006

Belgium (2006)	FNVA	FNI	FNVA per AWU	FNI per AWU
EU Farm Economics Overview FADN 2006	78.254	55.178	41.571	29.312
⇕	⇕	⇕	⇕	⇕
Figures from FADN Public database 2006	81.566	57.393	42.684	37.065

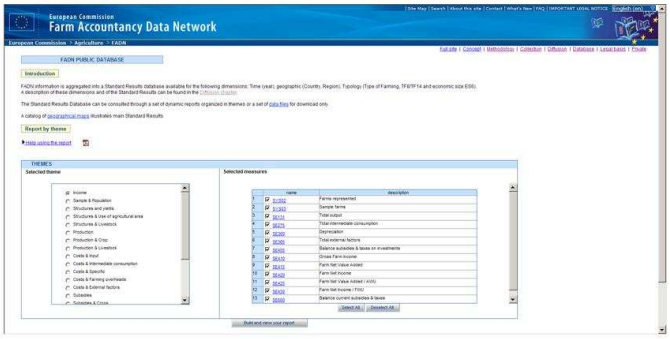
  - ⇢ What figures to believe? To use?

Problems - type 4

- **Methodological aspects**
- Analysis: some important questions before getting started:
  - *What figures/indicators are needed?*
  - *What are the dimensions?*
  - *How accurate the data must be?*
  - *What databases can we use?*
  - *What calculations to make/ statistical methods to use?*

Analysis - Source Data

- FADN Public Database
  - http://ec.europa.eu/agriculture/rica/database/database.cfm



Standard Results

- FADN Public data do not correspond with the data in the Economics Overview report

Region	Year	Standard Results		Economics Overview	
Bel	2006	SE010	1.91	Annual Working Unit	1.88
Bel	2006	SE415	81566	Farm Net Value Added	78254
Bel	2006	SE420	57393	Farm Net Income	55178
Bel	2006	SE425	42784	FNVA/AWU	41571
Bel	2006	SE436	482438	Total Assets	450393
Bel	2006	SE485	133572	Total Liabilities	126110
Bel	2006	SE501	348577	Net Worth	331869

- FADN Private Data (RICA II) idem

Standard Results

- Why are the figures different?
  - *Different (smaller) sample? Different method of weighing the data?*
- Can we use other data sources?
  - *Calculate Standard Results from FADN sample (calculation methods are published)*
  - *Tables (A to N) --> Standard Results (SE)*

Standard Results

- Method:
  - *Cleaning the data*
  - *Computing individual SE variables on the sample*
  - *Computing the weighting coefficients of the sample data, based on FSS*
  - *Computing the aggregated SE variables*
- Benefits:
  - *Individual Standard Results (non aggregated)*
  - *Use other aggregations*
- Drawbacks:
  - *Programming may be time consuming (initially)*
  - *Still differences due to stratification of sample and FSS*

Stratification

- TF8:
  - (1) Fieldcrops
  - (2) Horticulture
  - (4) Other permanent crops
  - (5) Milk
  - (6) Other grazing livestock
  - (7) Granivores
  - (8) Mixed
- ES6:
  - (4) 16 - <40 ESU
  - (5) 40 - <100 ESU
  - (6) >= 100 ESU
- Region:
  - (341) Flanders

Stratification 2006 sample

- FADN sample 2006 (columns 2, 4, 6, 8)
  - *VAR 34= TF8; VAR 36= ES6*
- RICA DWH 2006 (columns 3, 5, 7, 9)
  - *RICA TF8 and ES6 calculations*

TF8\ES6	4		5		6		Total	
1-FCROP	20	13	28	34	24	25	**72**	**72**
2-HORT	14	12	60	52	113	126	**187**	**190**
4-OPCR	5	5	16	15	52	53	**73**	**73**
5-MILK	6	4	75	67	46	49	**127**	**120**
6-OGL	12	9	30	32	23	27	**65**	**68**
7-GRAN	3	3	15	22	49	43	**67**	**68**
8-MIX	7	5	43	36	71	78	**121**	**118**
Total	**67**	**51**	**267**	**258**	**378**	**408**	**712**	**710**

- Bigger economic size in the RICA DWH

Stratification Field of survey 2007

- FSS 2007 (columns 2, 4, 6, 8)
  - *AMS TF8 and ES6 calculations*
- RICA DWH 2006 (columns 3, 5, 7, 9)
  - *RICA TF8 and ES6 calculations*

TF8\ES6	4		5		6		Total	
1-FCROP	1331	1300	935	880	522	550	**2788**	**2730**
2-HORT	579	570	1066	1080	1362	1510	**3007**	**3160**
4-OPCR	258	260	407	420	727	730	**1392**	**1420**
5-MILK	401	400	2009	2010	1332	1330	**3742**	**3740**
6-OGL	1266	1100	1362	1360	926	950	**3554**	**3410**
7-GRAN	254	250	883	890	1297	1290	**2434**	**2430**
8-MIX	747	470	1396	1370	1985	2000	**4128**	**3840**
Total	**4836**	**4350**	**8058**	**8010**	**8151**	**8370**	**21045**	**20730**

- Bigger economic size in the RICA DWH

Stratification FSS 2006

- Guess: did they use the FSS of 2006 to make the report? Let's run the program…

Bel-2006						
Standard Results		Economics Overview				
SE415	81566	FNVA	78254	**95.94**		
SE420	57393	FNI	55178	**96.14**		
Vl-2006						
Standard Results		VIAindicators	FSS2007		FSS2006	
SE415	86803	FNVA	85454	**98.45**	83047	**95.67**
SE420	60853	FNI	60063	**98.70**	58381	**95.94**

- Use of the FSS 2006 to calculate the weighting coefficients

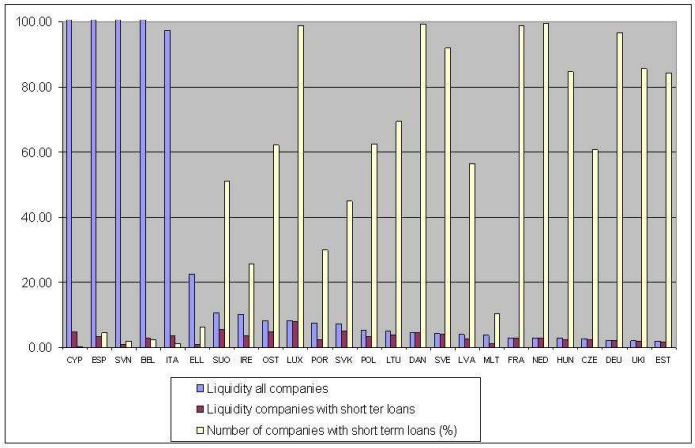
VIA Indicators

- All Indicators are derived from the Standard Results:
  - *FNVA=SE415;*
  - *FNI=SE420;*
  - *FNVA_AWU=SE415/SE010;*
  - *FNI_AWU=SE420/SE010;*
  - *Productivity=SE131/(SE270+SE390+SE395+SE408);*
  - *Solvency=100*SE485/SE436;*
  - *Liquidity=SE465/SE495;*
  - *Return on assets=100*SE415/SE436;*

Problems - type 5

- **Problems of data collection**
  - *Liquidity: SE465/SE495*
  - *Why so high for Belgium/Flanders among other countries (Cyprus, Spain, Slovenia)?*
  - *Only 5 of the 710 companies have short term loans (SE495), but they all have current assets*
- Solution
  - *More accurate data collection?*
  - *Different ratio in the economics overview?*

Liquidity



General conclusions

- EU FADN Economics Overview **very usefull** for this type of exercise
  - *and all help is very welcome at Farm Economics Overview level for best interpretation of the data*

- **Very important** to moderate hopes of policy makers to use the data for quick policy making
  - *aim for the longer term*

- **Very important** to speed up the availability of the data (or at least not to decrease the speed of making them available)

- **Very important** to clear some of the methodological and accuracy issues

THE END

19 Monitoring sustainability of Dutch agriculture

Koen Boone and Mark Dolman
LEI (Agricultural Economics Research Institute)

19.1 Abstract

A more sustainable agriculture is widely used terminology to describe the main challenge of the agriculture sector. Sustainability is however a fuzzy concept. What does sustainable agriculture mean and how do we measure progress? In this paper we describe the process that resulted in a report measuring the sustainability of Dutch agriculture. The report describes the long term development of the performance of 7 farm types on about 25 sustainability themes (ranging from income to pesticides use and animal welfare).

A large part of the data was based on the Dutch Farm Accountancy Data Network, a database that includes the individual data of 1,500 farms that are representative for Dutch Agriculture. This made it possible not only to look at averages scores for the sector but also to look at spread in scores between the farms. Large differences exist between the farms on the performance on nearly all sustainability themes. The use of micro data also made it possible to identify farms that are performing well on nearly all sustainability themes. These farms show that there is not necessarily a trade off between environmental and social performance on the one hand and economic performance on the other hand. An analysis on how these farms differ from other farms will help to make Dutch agriculture more sustainable.

19.2 Introduction

A more sustainable agriculture is often used as vocabulary to popular describe the main challenges within the agricultural sector. Governmental agencies, both national (i.e., Dutch Ministry of Agriculture, Nature and Food quality (ANF) (2002, 2007)) as well as international (i.e., European Union (2001, 2010), set sustainability as a key-objective in its policy-description. Sustainability, however, is a fuzzy concept. Various definitions are used to define it as a concept. Moreover, a large number of methodologies and performance indicators are used to assess its development. What does sustainable agriculture mean and how do we measure progress? A long list of authors have already tried to translate this fuzzy concept of sustainability into meaningful indicators that can be used to measure progress. The Brundlandt commission (WCED, 1987) introduced the most general used definition of sustainability: meet the needs of the present without compromising the ability of future generations to meet their own needs. Both the OECD (1999) and EC (2001) developed already frameworks and indicators on sustainable agriculture. These frameworks and long lists of indicators, however, have never been put in practice, either by a lack of translation of frameworks into indicators, or a lack of representative data to calculate the indicators. For small number of case studies, sustainability assessment within agriculture has been put into practice; however, these cases often used small number of farms and never provided a representative overview for a farm type or country as a whole.

The Dutch ANF and the Dutch Environmental Assessment Agency (DEAA) requested to measure sustainability of the primary agricultural and horticultural sector in a quantitative way. Firstly, this means that all indicators should be measured preferably from 1990 onwards to see long term development and secondly, data should be representative.

This paper describes the process and results of a project to measure sustainability of the primary Dutch agricultural and horticultural sector. Next to the primary objective of a monitoring report on sustain-

ability, the DEAA wanted to use the results for the evaluation of the Dutch policy concerning the level of sustainability of animal husbandry.

Section two describes the method used, including the processes used to reach the project goals and the selection of themes and indicators. Section three describes a method to come to more integrated conclusions than just presenting scores on separate sustainability themes. The final section presents the lessons learned.

19.3 Method

In order to produce a consistent assessment of Dutch agricultural and horticultural sector, a model for developing performance measurement systems was applied. This model was based upon a general model developed by Van Kerssens-Van Drongelen (1999) and adjusted to Corporate Social Responsibility by Ten Pierick and Boone (2005). Within this model (Table 19.1), 8 choices have to be made. For a detailed description of all choices, see Boone en Dolman (forthcoming).

Table 19.1	**Model for developing performance measurement systems**
Choice 1	Choice of goals/functions
Choice 2	Choice of scale level
Choice 3	Specification of preconditions and functional and user demands
Choice 4	Choice of themes
Choice 5	Choice of indicators, targets and measurement methods
Choice 6	Choice of weighting and aggregation methods
Choice 7	Choice of presenting of results
Choice 8	Choice of data sources

Scale level

The concept of sustainability implies that the scope of the study should be broad. However, for a practical assessment, the system and system boundaries need to be defined. The Ministry of ANF wanted to use the results of the project to evaluate their policy. Therefore, this project focuses only on *Dutch* agricultural and horticultural sector. Direct impact occurring abroad of Dutch agriculture (e.g. deforestation and loss of biodiversity due to feed production in South America), is addressed however. A focus on complete production chains have a preference from a theoretical viewpoint, since the sustainable behaviour of one link can be out weighted by the unsustainable behaviour of the next link in the chain. On the other hand, Life Cycle Assessment shows that for most agricultural products, the vast majority of the impact originates from primary agricultural production. Next to this, agriculture production chains are very difficult to define, while part of the agriculture product end up in a lot of different production chains. Furthermore, geographical definition of agricultural chains is difficult, while large companies in the processing industry operate all over the world. Due to this, data on sustainability indicators of agricultural production chains is hardly available. Therefore, we decided not to include the impact of other links in the Dutch production chain, like food processing and retail, and focus on the agricultural and horticultural sector itself.

Next to the delineation of the study, decisions are necessary how to aggregate and present results. Three options were identified: regional presentation, presentation per sustainability theme and presentation by farm type.

For local environmental issues, a regional split up has large advantages. Policy on nutrient management, for example, has regional aspect like soil and water quality. For several other environmental issues, however, no regional implementation is used, and policy objective have a sector or thematic approach (e.g., climate change, animal welfare). Because the report should be used for policy evaluation, it is important to link the developments on the sustainability themes to the policies of the Ministry of ANF. Furthermore, decisions on sustainable production are made by the manager of the farm and not on regional level or thematic level. Farm level, therefore, is often used for policies to increase the sustainability. The fact that a farmer is the main decision maker to improve sustainability was also the main reason not to choose for a thematic level. Another reason is that non agriculture actors might have a large impact on the thematic scores. Therefore a split up into farm types was made.

Selection of themes per farm type

For the selection of themes, a group of 12 researchers and sector specialists were asked to lists the main sustainability themes that they identified in policy notes of the government, farm organisations and NGOs. In this way, the viewpoints of all stakeholders could be included. Secondly, scientific literature and other research reports were taken into account.

Based on the long list of themes and the size per farm type (i.e., number of farms and economic size), a proposition was made which farm types (or chapters) to include in the actual monitor, namely: arable farming, fruit and vegetable production in open ground, ornamental plant cultivation in open ground (bulb growing and tree nurseries), greenhouse farming and cattle, pig and poultry farming. Next to a presentation per farm type, it was proposed to present for the agricultural and horticultural as a whole, so mixed farms could be included as well and interaction between different farm types could be included (e.g., nutrients).

The long lists of relevant themes per farm types were discussed by a large group of specialists from the Ministries of ANF and Housing Spatial Planning and the Environment (HSPE), researchers and DEAA. In a final workshop with representatives from all groups, final decisions were made which themes to include. The following criteria have been taken into account in the selection of the themes (based among others on GRI, 2006):

- Materiality;
- Inclusiveness (viewpoints of all stakeholders should be included);
- Completeness;
- Sustainability context (the context that is needed to understand the impact of the themes on sustainability should be described);
- Balance between themes;
- Lack of overlap and interaction between themes;
- Consistency of the list of themes.

Based on this process, it was decided to split the themes up into the most often used grouping of sustainability themes: profit, planet and people. Furthermore, each chapter should start with a description of the context. Therefore, a fourth group was added: Context. Within this introduction of the sector, the relevance of both organic agriculture and multifunctional agriculture is described. These types of farming have an impact on several sustainability themes and, therefore, could better be described in an integral way. Not all themes are relevant for all farm types (e.g., crop protection for pig farming).

Table 19.2	Selected sustainability themes
Context - Geographical distribution - Structure (Number of farms, area, animals) - Organic agriculture - Multifunctionality	**Planet** - Energy - Climate - Nutrients - Water - Crop protection - Biodiversity - Animal feed - Soil - Plant health - Fine particulate matter
Profit - Income - Financial position - Investment - Innovation - Competitive position	**People** - Spatial Quality - Image/Reputation - Labour - Succession - Animal Welfare and health - Food Safety

Selection of indicators per theme

After the identification of relevant farm types and themes, key-indicators were identified. A group of researchers started writing documents per theme using the following format:

- Why is the theme relevant for sustainability?
- Are goals set on this theme by government or farmers?
- Which indicators could be used to measure performance?
- Are indicators already measured or could they be measured at reasonable costs?
- Advantages and disadvantages of the most likely indicators.
- Are (relative or absolute) benchmarks available for the indicator?
- What is the best available indicator?

For the listing of advantages and disadvantages a checklist of criteria was developed (Table 19.3).

Table 19.3	Criteria to select indicators
- Completeness (for all aspect of a theme) - Structural availability of data - Representativity for the average farm in the Netherlands - Quantitativeness - Support of the indicator by stakeholders - Simplicity - Solidness (influence on score of external factors that are beyond the control of the farmer) - Reliability - Costs	- Comparability (in time, with other farm types, international) - Preciseness - Timeliness - Clarity - Possibility to link micro (farm) and macro (sector, country, region) level - Availability on farm level so spread in scores can be calculated - Availability of scores per sector/farm type - Consistency of indicators over sectors/farm types - Reproducibility

Based on the format described above, for each theme one or several indicators were proposed. The outcome was again discussed and reviewed by a various experts. In total, about 50 specialists were involved in the process. Experts on farm types, sustainability themes, policy, performance indicators and databases were involved. Based on their comments, new documents were studied and new experts were

consulted. During a workshop with all stakeholders, a final decision was made which indicators to include per theme and per farm type. About 85 indicators were selected. In some cases, no quantitative assessment was possible, either a suitable indicator was not available, or data to fill in this indicator was lacking. This resulted in a list of blank spots and recommendations to solve them.

19.4 Results and integrative conclusions

For the total agricultural and horticultural sector as a whole and each farm type, the performance on sustainability was presented. For each theme the following structure was used:
- Why is theme relevant for this farm type?
- Are goals set by government or farmers?
- Description of indicator used.
- Development of the score of the indicator on the long term.
- Explanations for the development of the score (with special focus on impact by government policy).

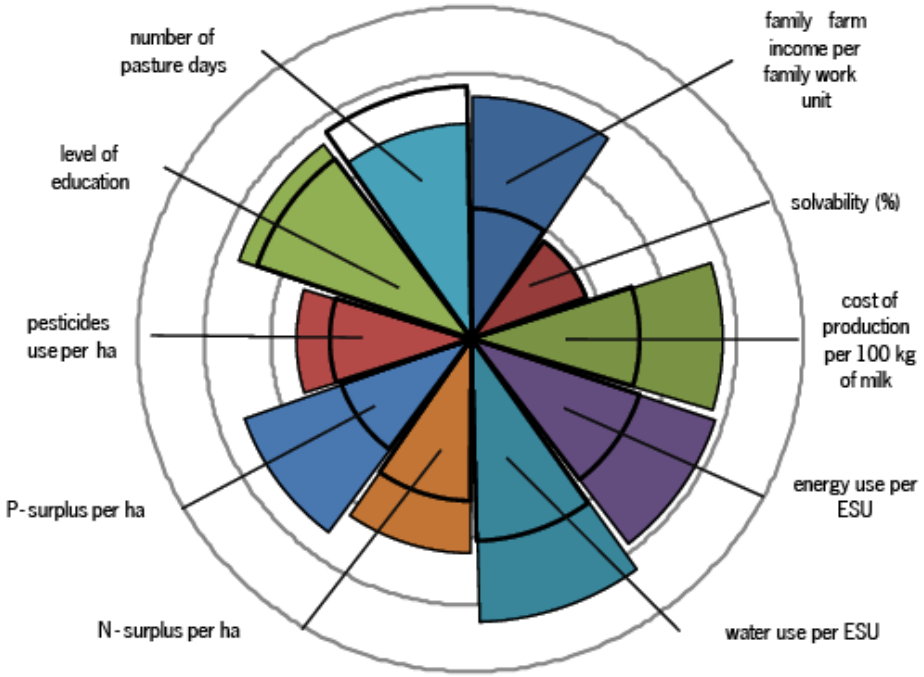
Interaction between themes
Apart from this long list of results per theme and sector, it is interesting to have more integrative results, for example, are there farms that do perform sustainable on nearly all themes and how those farms look like?

Since a large number of indicators are based on the Dutch Farm Accountancy Data Network, results are available at farm level for a large group of farms. This enables to compare the sustainability performance of organic farms and conventional farms. It also makes it possible to use indicators like the percentage of farms that have a total household income that is persistently below the poverty threshold, or the percentage of farms that reached environmental goals.

Best performing farms
Based on three-year average results (2006-2008) the most sustainable dairy farms based on 10 themes were identified. The analysis is based only on the homogeneous group of dairy farms to prevent that scores are influenced by differences in crop plan or differences in animals kept. First, for every theme the 25% best performing and the 25% worst performing farms were identified. Secondly, farms were selected that ended up the most times in the best performing group and the less times in the worst performing group. These farms were labeled as the sustainable farms. Moreover, this group of farms is compared with the average farm (figure 1). The scores per theme in figure 1 are harmonized over the themes. A score of 100 means that a farm belongs to the 10% best performing farms. Subsequently, a score of 0 means that a farm belongs to the 10% of worse performing farms. The scores in between are set by linear regression (Stedula, 2006; Meul et al., 2009). In figure 1, the scores of the sustainable farms are presented by the coloured wedges. The scores of the average farm is presented by the thick coloured line.

Figure 19.1 shows that farms do exist that outperform on 9 of the 10 themes. They only perform worse than the average farm on number of pasture days. Large differences exist between the two groups of farms on the performance on family farm income, cost of production, water and energy use and use of nutrients. These farms show that there is not necessarily a trade-off between environmental on the one hand and economic performance on the other hand. There seems to be large potential for improvement in sustainability by bringing the average farm on the level of the best performing farm. In the report the characteristics of the more sustainable farms are compared with the average farm. This kind of analysis will help to improve the performance of the less sustainable farms and in that way make Dutch agriculture more sustainable.

Figure 19.1 **Comparison of the scores of the most sustainable farms (coloured wedges) with the average farm (thick black line) 2006-2008**



19.5 Lessons learned

The current project resulted in a 350-page report. One of the disadvantages of a report is that some of the data are soon outdated. Because some of the data become only available quite some time after the reporting period of the data and because the production of this huge report took quite some time, some of the data are already from two or more years ago. Therefore a website that is updated as soon as new data is available would be a real improvement. This gives also the possibility to make links to more detailed data, methodology, used databases and relevant policy documents.

The management of the project was quite complex while so many specialist were involved. The involvement of these specialists was however really needed. To end up with the best indicator detailed knowledge is needed about the theme, policy, datasets, indicators, et cetera. Most recent developments on these fields are not documented yet and can only be assembled by involving those specialists. The involvement of this large group of people also increased the support of the indicators used by all stakeholders.

For some of the indicators it is difficult to judge how good Dutch agriculture is performing while a clear benchmark does not exist. A possibility to compare the data with other countries would deliver real added value.

When results are presented for all individual sustainability themes, it is complex to draw integral conclusions. Having a large group of indicators from one micro economic database gave the possibility to go more into detail on trade offs between sustainability themes and made it possible to present the characteristics of the integral sustainable farms. This gives both the Ministry of Agriculture and individual farmers action points to make Dutch agricultural more sustainable. The project could deliver even more added value if the results of the report could be discussed with all stakeholders. In this way more background information could be assembled about the reasons behind the current trends but also about the obstacles that prevent the Dutch agriculture to become more sustainable.

19.6 Literature

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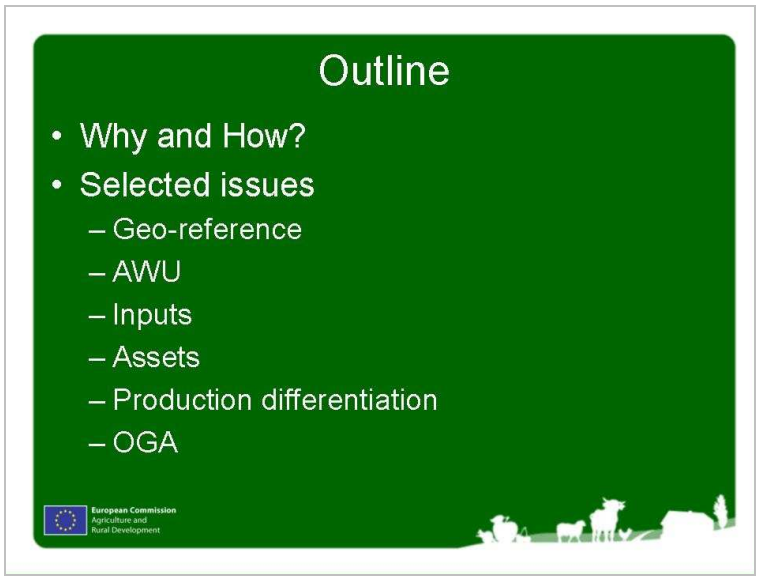
20 New farm return for the EU-FADN post-2013

Introduction to workgroup session 1

Thierry Vard and Piotr Bajek, European Commission
Agriculture and Rural Development



Why?

1) Regular adaptation of the collection following policy changes or enlargement (1992-2000-2003/04-2009)
2) New needs of information as CAP is confronted with "new" challenges:
   - Environment / climate change
   - Quality
   - Diversification of activities
3) Need of improvement of the information
   - Competitiveness
   - Income and wealth of EU farmers
4) Adjustment to new standards and surveys
   - IFRS / IAS
   - Farm Structure Survey – EU Typology

European Commission
Agriculture and Rural Development

How?

1) User's Conference in Malta September 2008
2) Exchange of view in FADN Committee Meetings during 2009
3) 3 Working groups meeting 5 times between 12/2009 to 09/2010: to adjust the proposal to technical & budgetary constraints
4) Regular reporting to FADN Committee and all MS
5) Commission proposal expected in 2011

European Commission
Agriculture and Rural Development

Georeference

- Location of the holding (A31): the commune code would be replaced by the geo-reference (latitude, longitude)
  - Major problems of the current definition
  - Main objectives
    - regrouping farms according to various zoning
    - adding information from other geo-referenced database
  - Reservations
    - Single point to be geo-referenced →FSS handbook solution
    - Confidentiality issue
      - data never published at individual level
      - Strict confidentiality agreement
      - Council Regulation – article 16
      - **A31 never provided outside the Commission for confidentiality reasons**

      + FSS handbook principles to protect confidentiality

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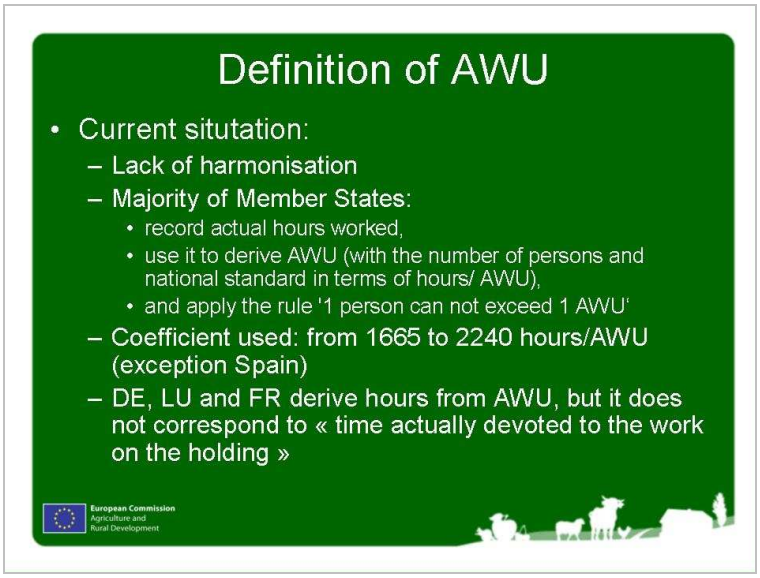
Definition of AWU
• Current situtation:
– Lack of harmonisation
– Majority of Member States:
• record actual hours worked,
• use it to derive AWU (with the number of persons and national standard in terms of hours/ AWU),
• and apply the rule '1 person can not exceed 1 AWU'
– Coefficient used: from 1665 to 2240 hours/AWU (exception Spain)
– DE, LU and FR derive hours from AWU, but it does not correspond to « time actually devoted to the work on the holding »
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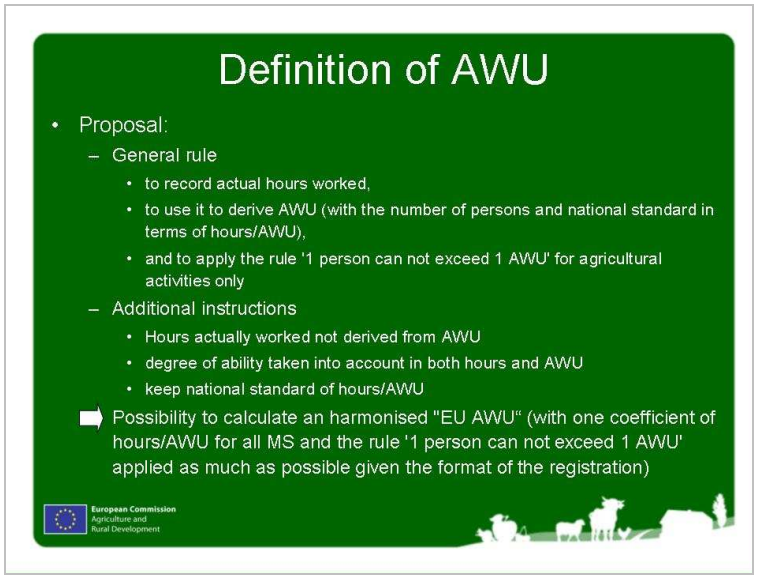
Definition of AWU
• Proposal:
– General rule
• to record actual hours worked,
• to use it to derive AWU (with the number of persons and national standard in terms of hours/AWU),
• and to apply the rule '1 person can not exceed 1 AWU' for agricultural activities only
– Additional instructions
• Hours actually worked not derived from AWU
• degree of ability taken into account in both hours and AWU
• keep national standard of hours/AWU
➡ Possibility to calculate an harmonised "EU AWU" (with one coefficient of hours/AWU for all MS and the rule '1 person can not exceed 1 AWU' applied as much as possible given the format of the registration)
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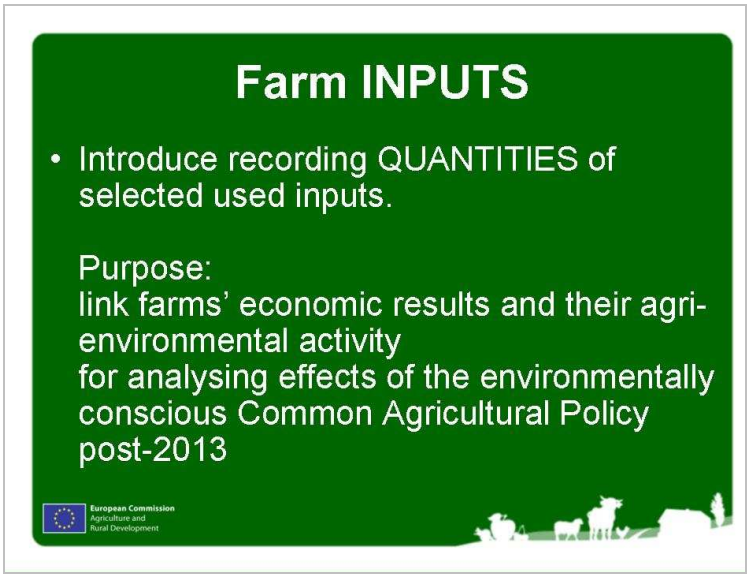
Farm INPUTS
• Introduce recording QUANTITIES of selected used inputs.
Purpose:
link farms' economic results and their agri-environmental activity
for analysing effects of the environmentally conscious Common Agricultural Policy post-2013
European Commission
Agriculture and Rural Development

Farm INPUTS

- Quantity of **N-P-K** ingredients of fertilisers (difficult for NPK from mineral fertilisers, impossible directly for organic ones)
- Quantity of **water** (impossible directly)
- Quantity of **energy** (only electricity, gas, liquid fuels discussed by now)
- Quantity of **pesticides** (impossible directly)

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Farm ASSETS

- Use of International Financial Reporting Standards (IFRS) / International Accounting Standards (IAS), with exceptions
- Include all biological assets (i.e. also animals) in the assets table.

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Farm ASSETS

- IFRS / IAS consequence:
  departure from one method of valuation (replacement value) for the benefit of historical cost or fair value methods, as appropriate.
- Which data on assets include in farm agricultural income and how?

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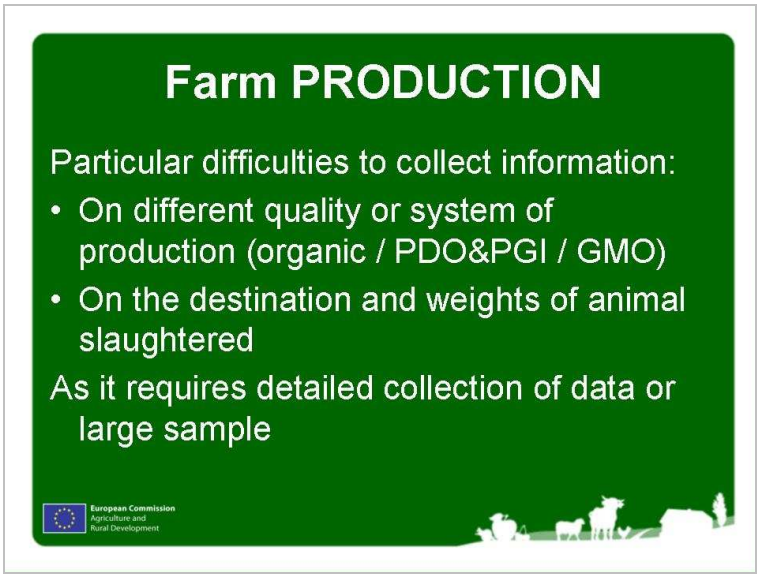
Farm PRODUCTION
Particular difficulties to collect information:
• On different quality or system of production (organic / PDO&PGI / GMO)
• On the destination and weights of animal slaughtered
As it requires detailed collection of data or large sample
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Other Gainful Activities
• Why?
– Need of a better information on farmers' income (policy justification and assessment)
– Collection of OGA not harmonised among Member States
– New definition of OGA developed in FSS and in EU-Typology
• Challenge: Not the same coverage in farm accounts in MS (very restrictive to very large) and limited margin of manoeuvre (fiscal laws and cost)
European Commission
Agriculture and Rural Development


Other Gainful Activities
• Aim & Proposal
– Better distinction between agricultural activity and OGA.
– Distinction of costs is limited to specific costs.
– OGA restricted to those directly related to the holding (using agricultural resources such as means of production and products). Others are excluded from accounts.
– OGA directly related to the holding should be covered "as much as possible".
• Specific issue for the processing of farm products (considered as an OGA)
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21 Workgroup session 1

The future of the EU-Farm Return

This workshop was introduced by a presentation about the future plans for the EU Farm Return by DG-Agri. Handouts of slides were distributed.

The discussions are still going on and no decisions are made yet. This is therefore the moment to give feedback to the plans. We broke up in small groups and discussed the proposals. Group A and B discussed the proposals of EU working group 1 and group C and D discussed the proposals of EU working group 2. Both groups however were free to come up with new ideas, variables, alternatives, et cetera.

Group composition	
Group A	**Group B**
Torbjørn Haukås (chair)	Christine Lethi (chair)
Aleksandra Martinovska Stojceska (reporter)	Arto Latukka (reporter)
Sanne Bouters	Constanze Hofacker
Marju Aamisepp	Thierry Vard
Paul Oljans	An Van den Bossche
Vesna Ilievska	Laura Esposito
Frank Offermann	Mediha Halimi
Ann-Marie Karlsson	Eline de Regt
Dirk van Gijseghem	
Group C	**Group D**
Rembert De Blander (chair)	Hennie van der Veen (chair)
Bernard Del'homme (reporter)	Nicole Taragola (reporter)
Ester Van Broekhoven	Concetta Cardillo
Selina Matthews	Andreas Roesch
Piotr Bajek	Xhaferi Hakile
Anita Stamnova	Hans Vrolijk
Liam Connolly	Antonella Bodini
Boris Tacquenier	Andrew Woodend
	Joeri Deuninck

Outcome

Group A

1. Georeference

Benefits	**Threats**
- Give possibility for more types of analysis - E.g. benefit in analysis of environmental factors - Similar circumstances for more countries - Important for subsidies linked to the environment	- If only headquarter location noted, not enough info are provided (soil quality et cetera) - Land fragmentation - Feasibility - Confidentiality issue (if the parcel/plot is known) - Important for trust in the survey - At least 3 different geo-references for one farm (FSS, FADN, IACS)

Suggestion: To introduce it gradually, in 10 years period.

2. Definition of AWU

Benefits	Threats
- Used a lot as indicator when comparing between countries - Should be harmonised on EU level for comparison reasons - A clear definition is needed (If not, it is important to know how countries calculate)	- Difficult to measure - Now done differently at different MS - Different number of hours in AWU - Different in FSS and FADN - Labour is the most difficult information to get - What does the labour definition comprise? - What do you measure?

3. Farm inputs

Benefits	Threats
- Important in evaluating environment issues (e.g. fertiliser use) - Link economic results with agri environmental activities - Effects of policy - Data to be used for RD program (especially AE measures) - Also used for research in climate, water, energy	- Water usage: water that is pumped or that is used from a water network is recorded; water from rain is more difficult to record - Pesticide/fertiliser experience: In Belgium recorded by pesticide code and annual inventory - a list is prepared with all available pesticides and fertilisers - Recorded also for other purposes in some countries (e.g. Germany) - A change is needed in the data recording system - Get data electronically from the bills? (e.g. Norway)

Farm production:

- More info from the cattle register
- Weights are more problematic
- Representativeness of organic farms (number of farms with organic, PDO/PGI or GMO)
- Also an issue for OGA
- Defining OGA: what it contains

Group B

1. Georeference

- Confidentiality is a problem
- Privacy issue problem
- The economic data and georeference codes are in the same database
- Georeference codes will not be sent outside to commission
- Production type. Change of georeference
- Even with the municipality code we get problems
- Researcher can benefit

2. AWU

- Problems with the definitions
- Hours of paid and unpaid labour and OGA is needed
- Difficulties to get accurate working hours of unpaid labour from the farms

- Different practises in MS for calculating AWU
- OGAwork and agricultural work may be registered as shares of total working time in some MS
- Labour allocation to the products

3. Farm Inputs

NPK:
- NPK recording exists in some MS. Production plans
- Organic fertilisers can be calculated from the manure (variation in farm level depending how the manure is handled)

Water:
- Not problem in some parts of EU and in some part of EU it is big problem
- Irrigation or not irrigation, quantity of water is more difficult to have

Group C

1. Assets

- Following guidelines as most as possible
- Taking onto account some specific assets in agricultural sector

2. Farm production

- More detailed data in FADN questionnaire
- Automatic links with other available data sources (FSS, other surveys,…)

3. Other gainfull activities

- Agree with restriction in definition
- Costs estimation: specific

Group D

1. General

- Be careful for duplication of data collection (NPK in some countries, weights in Eurostat)

2. Farm assets

- Replacement values often used (indices for changes in value and depreciation
  - Farmers prefer: a better indication of value of machinery
- Biological assets:
  - Market price at beginning or end of year
  - Switzerland average market price
- Biological assets pigs and poultry affect income, revaluation of fixed assets do not affect income (except for depreciation)

3. Farm production

- Put a flag at PDO/PGI
- Organic production is frequently known
  - Produce or sell organic?

- Slaughter weights added value over Eurostat data?
  - Different groupings, so it has added value
  - Farmers often do not know destination
  - Only record values directly to slaughterhouse (impute others)

4. Other Gainful Activities

- Most countries have data available
  - Forestry is excluded in Italy - will be included

- Definition of OGA
  - Is there a threshold
  - Directly related
  - Need clear definitions / guidelines (connect to FSS definitions)
  - Differences between National laws and FADN
  - Focus on the main ones

- More complicated to collect costs
  - Difficult to separate (especially indirect costs)
  - Labour input (AWU)
  - Direct costs

22 Workgroup session 2

Design a new FADN website

A lot of national FADN's do have a website where standard results are published, or possibilities to use the data, are described. Most of the time these sites were started rather simple and new features have been added over time. Internet has become more and more important as a dissemination tool and new technical possibilities have been introduced. In this workshop we designed the ideal FADN website. We did this by studying the wishes of the different stakeholders.

Group A designed a national FADN website targeted to policy makers. Group B to researchers, Group C to farmers. Group D designed a site on world level that assists users that would like to use FADN data from different countries/continents (with links to national FADN's) and assists national FADN managers in improving their FADN.

Group composition	
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Sanne Bouters (chair)	Ann-Marie Karlsson (chair)
Andreas Roesch (reporter)	Anita Stamnova (reporter)
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Christine Lethi	Concetta Cardillo
Liam Connolly	Ester Van Broekhoven
Paul Oljans	Hennie van der Veen
Mediha Halimi	Frank Offermann
Tom Coulier	Peter Mortier
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Rembert De Blander	Bernard Del'homme
Elsa Laval	Constanze Hofacker
Antonella Bodini	Marju Aamisepp
An Van den Bossche	Bernd Kuepker
Arto Latukka	Joost D'Hooghe

Outcome

Group A

New webpage for policy makers

What kind of information do they need? Policy makers don't need a website!

Less important

- Benchmarking
- Detailed figures
- Technical data
- No census data - mixture of FADN and census is 'dangerous'

Important

- Some key figures
- Keep it simple
- Time series
- Lots of grafics, histograms
- Topics change
- Time series
- As simple as possible

Group B

A national FADN website targeted to researchers

- Researchers want access to micro data
- Good information for definitions, variables used for producing metadata should be available on the web site
- Access to background document from RICA
- Well defined procedures to access micro data (to ensure confidentiality)
- Contact persons to assist in methodological questions referring to the data
- Reports for aggregated data and research reports and micro models based on FADN data
- Standardised reports for agriculture on each Member State
- Links to other FADN web pages to be able to make some comparisons
- To have an option to use the appropriate computer software to be able to analyse the data
- Researchers should give feedback on the quality of the data
- Researchers should give feedback on the their research results
- To improve cooperation between responsible institutions for FADN website among EU Member States

Group C

FADN Website for farmers

Issues

- Just one website for all stakeholders? 'One-stop' shop?
- Only farmers in FADN? Or all farmers?
- Many farmers still do not use computers
- Main interests:
  - Technical data, e.g. yields
  - Also income data
  - Farmers are always interested in how their business compares with others
  - Other information, e.g. weather forecast
  - Non-FADN data?
- Many farmers interested in seeing how the data is used, e.g. for policy development
- Many farmers do not know about farm classification and methodology, - but to what extent should try to inform, e.g. FADN (and other terms) e.g. NVA - how do put it into simple words
- Other members states? Especially neighbouring countries
- Regional comparisons (by farm type) can also be valuable for farmers, as well as national figures
- Forecasts also valuable for farmers
- Might be able to refine forecasts using farmer-inputted data

- Graphics, maps, as flexible as possible
- FAQ, agricultural topics
- Resource issues?
- Highlight your interests
- Farmers expectations, e.g. economic cycle
- Basics - no 'barriers' e.g. passwords, unless absolutely necessary
- Selling point for FADN co-operation?

Group D

World website

- Which stakeholders to take into account?
- Researchers, experts working for policy-makers, not for farmers
- Data sets
- Who will host the site?
- Agreement between several international organisations - OECD, FAO, EU?
- High-level variables to cover balance sheets, profits and loss and costs, physical variables e.g. farm area, nb. of cows, et cetera.
- What kind of farms should be supplied? Based on a broad typology, rules should be defined
- Provision to carry out analysis in different currency units - PPS adjustment for different standards of living
- Being able to provide surveys or other analyses on topics related to FADN

23 Workgroup session 3

FADN: Tool for monitoring income or agricultural policy?

Already from the start of the EU-FADN, discussion started on the purpose of the database. Is it just a tool for monitoring income of farmers based on data that is readily available at accounting offices or should it be a policy tool with content changing depending on priorities in agricultural policies?

In the beginning the discussion mainly focused on economic indicators. Should a detailed split of costs, output and resources be made or is just the total income relevant. During the last years the focus is also on environmental indicators, off farm income. Other gainful activities, technical parameters like kg sold and how the products are marketed (PDO, organic, energy crops, sales on the farm).

Within the European Union roughly speaking two types of FADN's exist. In type X data are bought from accounting offices and only the data that is needed by the EU is assembled. There is a strong focus on income. In type Y FADN data is assembled by the employees of the managing institute. Next to the EU-FADN variables, data is assembled for national purposes. The data that is assembled might change from year to year depending on policy priorities and now and then extra questionnaires are sent to the farmers. This difference in organisation can lead to a different viewpoint on the purpose of FADN. While a switch from type X to Y or the other way around is not easily realised, the risk exists that both groups only defend their own position and the discussion comes to a standstill.

The caps of De Bono

Discussing topics that are controversial lead often to yes/no disputes which are not very useful. The Maltese/English thinker Edward de Bono, who studied the process of discussion, thinking and decision making in great detail, therefore invented a method to make such discussions more constructive.

In his book *I am right, you are wrong* De Bono replaced Western style thinking by his theory of 6 caps. In this technique all persons in the discussion involved - symbolically - put a cap of the same colour on their head. A white cap stands for information, information that lacks and types of information. A red one for emotion and intuition. The black cap represents disadvantages, why solutions don't work, risks. The yellow one for advantages, why it works, positive things. And the green one stands for possibilities, new ideas, creative thinking. A blue one (put on your head as last one) stands for the management of the thinking process summary and conclusions. When for example everybody is wearing the black cap, all participants are only allowed to bring in disadvantages.

By this technique competition between discussing persons and hidden or troubled emotions have a less negative impact on the discussion and its results. In this working group session we give this technique a try.

We discussed in small groups the option of adding data in FADN like environmental indicators, off farm income. Other gainful activities, technical parameters such as kg sold and how the products are marketed (PDO, organic, energy crops, sales on the farm). Both the position of the type X FADN and type Y FADN were kept in mind if they were not both represented in the group. It was assumed that the data was really needed for policy purposes but that alternative ways exist to assemble the information.

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Antonella Bodini (chair)	Marju Aamisepp (chair)
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Hennie van der Veen	Frank Offermann
Selina Matthews	Nicole Taragola
Arto Latukka	Liam Connolly
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Group C	**Group D**
Mariusz Safin (chair)	Alexander Bartovic (chair)
Andrew Woodend (reporter)	Mediha Halimi (reporter)
Ester Van Broekhoven	An Van den Bossche
Xhaferi Hakile	Aleksandra Martinovska Stojceska
Anita Stamnova	Hans Vrolijk
Paul Oljans	Torbjørn Haukås
Andreas Roesch	Vesna Ilievska
Ann-Marie Karlsson	Joost D'Hooghe

Outcome

Group A

White cap
- For policy making some information is missing
  - Information about OGA is not detailed enough
  - Organic farming
  - Energy
- Some social data
- More technical information
- Off farm income is missing

Red cap
- Assembling data takes a lot of time
- More information
- It will be very hard to collect the data
- Controversial issue: replacement of income by sustainability

Black cap
- Data are not available
  - Only in big farms
- A lot of more data to collect
- Extra-costs
- Reliability of information collected

Yellow cap
- Better information for policy making
- Farm management could be optimised
- More monitoring for better farming

Green cap
- Some data can only be collected on a national level
- Not every year
- Sub-sample for specific themes
- Harmonisation of methodology
- Option to work on a different level
    - Environment
    - Social
    - Economic (EU-level)

Blue cap
- There is interest in other data
- You can learn from each other
- Method for collecting data could be implemented by other countries

Group B

Informations
- What kind of information is needed
- The cost benefits of the different options and differences between MS
- Evaluate what is already available

Feelings
- Problem is not solved
- Exploit better what to have already in FADN
- Many countries do evaluation for rural development so it is necessary more collaboration between FADN and this issue
- Harmonisation of FADN data
- Acceptable limit to include environmental and social information

Dangers
- Expensive
- Bad quality of data
- Low responses
- More time to analyse extra data and increase the lack
- FADN will not adopt to real needs

Benefits
- Better policies analysis: more and deeper
- Useful to comparing Member States results
- Total costs to society could be lower because you could collect more data in a single survey

Possibilities-Proposals
- Link the discussion on FADN directly with CAP decisions (monitoring of the policies)
- Discuss issues in the same moment FADN-CAP
- Having transition period for change
- Changing or adding institutions involved in FADN
- Connecting FADN with other databases

Focus points
- Reframe the discussion closer to decision makers to adapt FADN to needs
- What type of monitoring system policy needs
- Changing in policy and changing in system
- Design a monitory system for new CAP
- A network of experts is better than a collection of data

Group C

White hat (required info)
- FADN is a tool - what is best means to obtain the info we want?
- Harmonised definitions
- Minimum economic data or bigger FADN?
- But all MS want more info for policy making
- A lot of data is already available - problem is in coupling of data sets to make best use of existing data.

Red hat (gut feelings)
- Expanded but could be better

Black hat (risks/dangers)
Expanded FADN
- Expanded FADN even me costly
- Difficulties in simplifying - already have 2000 entry points for data
- Time delays

'Simple' FADN
- Income is limited info

Yellow hat (benefits)
Expanded FADN
- Complicated CAP = need for detailed FADN (eg co-financed support)
- FSS is not frequent enough to provide adequate data to replace parts of FADN

'Simple' FADN
- Less additional burden
- Income subsidies mean income data is important
- Is FADN best tool, or say FSS - so FADN shouldn't necessarily try to obtain all the info
- Combined strategy has advantages, eg for comparing FADN data with FSS for data verification

Green hat (other possibilities)
- Only include environmental data (maybe policymakers not really interested in income)
- Survey every other year - Is it necessary to collect data every year?
- More use of other surveys.

Blue hat (focus points)
- Have to expand - otherwise …??
- All MS opposed to extra admin burden
- FADN is well suited to analyse policy because multi dimension info, but if you want to measure say EU pesticide use then we already have the EU pesticide survey?
- EU strategy on data requirements - eg FADN and FSS Directorates to develop strategic approach.
- Complete picture of farm business good aspiration - looking at economic, environmental and animal welfare sustainability. Whole farm picture (via an expanded FADN) means we can see the farm context of, for example, fertiliser use. (eg context in terms of economic performance, intensity of production)
- Sample ideal for economic data is not ideal for environmental data
- It will be necessary to adapt FADN

Group D

Red with white hat
- We have to change data according to the policy makers needs
- Details are important
- Go for it
- Good for farmers: participation motivation
- Important for quality of the data; better for *all* users
- Only financial data covers only a part of CAP, successful FADN gives more than only a tool for policy, but also for the EU farmers

Black hat
- Expensive (time is money)
- Difficult to harmonise; a lot of different products
- Harder cooperation with the farmers; is the quality good, is it reliable; too much work for the farmers (administration)
- We might lose farmers
- Pesticides for example are very difficult because things are changing fast

Yellow hat: benefits
- For whom? Farmers, policy makers, farmers, public
- Result: impact of farming on the environment

Farmers
- Can get a benchmarking on the topic, to use in the management of their farm
- Get an improved advisory service

Policy makers
- Evaluation of policy
- Budget
- Where to go in the future

Researcher
- More accurate date saves time (money)

Public
- Will get a broader picture
- Improves transparency of use of the money
- Control of the spending
- Better, still cheap, food and environment

Green hat

- Incorporate all farmers in CAP and oblige to give the data. All other firms are obliged to have book-keeping. Mandatory
- Invoices, some farmers do not know how much a recent investment costs
- If they do not have their primary data; how can we gather the secondary data
- Use other sources f.ex. FSS:
    - You should be able to link data sources in other to link economic and environmental data and make conclusions; not every year
    - Suppliers: cannot give enough information, what are they going to use it for, they don't know

Blue hat

- Changes one at a time or all at one time? At one time and then improve those changes
- It should be done
- Check feasibility: First determine whether you can obtain data, test it

24 List of participants PACIOLI 18

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